GALATA YÖS-SAT YAYINLARI

YÖS

Yeni Tarz Sorular | New Style Questions

MATEMATİK 1
Mathematics

Soru Bankası / Question bank

ISBN: 978 – 605 – 06867–0–8

Yayın kurulu / Publishing Board
Galata

Birinci baskı / First Edition
Mart 2020

Kapak tasarımı / Cover Design
Tirkish Gurbanov

Baskı / Press
Aykut Basım

ÖNSÖZ

Değerli öğretmen ve sevgili öğrencilerimiz;
Galata Eğitim kurumları, 2005'ten bugüne YÖS, SAT ve TÖMER sınavlarına hazırlanan öğrencilerimize eğitim öğretimin yanısıra rehberlik hizmetleri de veren bir eğitim kurumudur.
Kurumumuz ülkemizde YÖS'e girecek öğrencilerle birlikte dünyanın farklı yerlerinden ülkemize gelen uluslararası öğrencilere de YÖS'e hazırlanma aşamasında şu hizmetleri vermektedir;
- Ders çalışma teknikleri
- Üniversite ve bölüm bilgileri
- Başvuru ve tercih aşamasında rehberlik hizmetleri

Öğrencilerimiz bu aşamalardan doğru yönlendirmelerle geçerek, adım adım başarıya ulaşması sağlanmaktadır.
Elinizde bulunan Matematik 1 soru bankası, Üniversitelerin son yıllarda YÖS'te sormuş oldukları yeni tarz sorulara göre hazırlanmıştır. Bütün konuları kapsayacak şekilde her tarz sorudan hazırlanan kitabımız, sizleri başarıya ulaştıracak ve sınavlarda karşınıza çıkacak sorularda pratiklik kazandıracaktır. Değerli öğretmen ve sevgili öğrencilerimize faydalı olması dileğiyle.

FOREWORD

Dear teachers and students;
Galata educational center is an educational institution that provides guidance services to the students who have been preparing for YÖS, SAT, and TÖMER exams since 2005.
Our institution is a hub of attraction for students from all over the world, for it familiarizes students with study techniques, provides information and details about universities and departments, and offers guidance services during application and preferences for the universities. And by doing so, it ensures success for our students.
The questions in the Mathematics 1 question bank were prepared correspondingly, through the years of experience to help you get a perfect score on the exam. All the questions are parallel and identical to the YOS exam questions. It covers all the topics which are in Math 1.
We hope to be beneficial to our valuable teachers and dear students

İÇİNDEKİLER

ÜNİTE 1

Unit 1

Temel Kavramlar / Basic Concepts

1. $4 - 8 + 5 - 9 = ?$

A) 9 B) 8 C) 5 D) – 4 E) – 8

2. $13 - 15 + 22 - 23 = ?$

A) – 16 B) – 15 C) – 13 D) – 3 E) – 1

3. $-18 + 21 - 33 + 41 = ?$

A) 11 B) 12 C) 21 D) 23 E) 31

4. $-4 + 5 - 6 + 7 - 8 + 9 - 11 + 12 = ?$

A) 2 B) 4 C) 12 D) 60 E) 72

5. $-8 + (-3) - (-7) = ?$

A) 4 B) 3 C) – 2 D) – 4 E) – 7

6. $-(-11) + 12 - (-13) - 14 = ?$

A) 20 B) 22 C) 23 D) 24 E) 25

7. $9 - 3 - [(-5) + 4 - (-3)] = ?$

A) 9 B) 8 C) 4 D) – 9 E) – 4

8. $[-11 + 15 - (-13) - 7] - [8 - (-9) - 10] = ?$

A) 17 B) 13 C) 9 D) 5 E) 3

9. $(-8) \cdot (3) - 5 = ?$

A) -29 B) -19 C) -16 D) 19 E) 29

10. $(-12) : 4 + 5 - 7 = ?$

A) 12 B) 9 C) -5 D) -8 E) $-\frac{25}{3}$

11. $(-13) + (-4) \cdot 5 - (-20) \cdot 2 = ?$

A) -73 B) -60 C) -7 D) 7 E) 73

12. $-3 + (-3 \cdot 2 + 4 - 8) \cdot 2 - (-4) = ?$

A) -19 B) -15 C) -5 D) 19 E) 77

13. $(-1 + 2 - 3) \cdot (-5) + (-4 + 5 - 6) \cdot 2 = ?$

A) 20 B) 10 C) 0 D) -10 E) -20

14. $(-5 + 5 \cdot 5 + 5) : 5 - 1 + 11 = ?$

A) 25 B) 15 C) 0 D) -15 E) -25

15. $2 \cdot (-2) \cdot 3 + 4 - 5 \cdot (-7) = ?$

A) -13 B) -5 C) 0 D) 13 E) 27

16. $-[a - b + (-c)] + [b - (-a) - 2c] = ?$

A) $2b - c$ B) $b - 2c$ C) $b - 2a$ D) $b + 2a$ E) $b + 2c$

1-E 2-D 3-A 4-B 5-D 6-B 7-C 8-E 9-A 10-C 11-D 12-A 13-C 14-B 15-E 16-A

1. $\frac{18}{9} + \frac{22}{11} + \frac{28}{7} = ?$

A) 3 B) 4 C) 8 D) 9 E) 11

2. $\frac{26}{13} - \frac{44}{11} + \frac{45}{9} = ?$

A) 3 B) 4 C) 7 D) 9 E) 11

3. $\frac{8 \,.\, 5}{4} + \frac{12 \,.\, 13}{26} - \frac{14 \,.\, 3}{7} = ?$

A) 22 B) 16 C) 10 D) 6 E) – 6

4. $\frac{19 - 38}{16 - 17} + \frac{12 - 21}{3} + \frac{14 + 19}{11} = ?$

A) 25 B) 19 C) – 19 D) – 21 E) – 25

5. $4 \,.\, (5 - x) + 3x = ?$

A) 20 + x B) 20 – x C) x – 20 D) – x – 20 E) 5 – 7x

6. $14 - 2(5 - a) + 3a = ?$

A) 4 + 5a B) 5 + 4a C) 5 – 4a D) 4 – 5a E) – 4 – a

7. $7(1 - a) + 8a(4 - 3) - 5a(8 - 9) = ?$

A) 7 + 3a B) 7 – a C) 7 + 6a D) 4a + 7 E) 7 + 7a

8. $\frac{21}{7}(x - 4) + \frac{13}{2}(x + 2) - \frac{13x}{2} = ?$

A) x + 1 B) 3x + 1 C) 3x – 1 D) x – 3 E) x + 3

9. $4x - 7 = 17$

$\Rightarrow$ **x = ?**

A) 4 B) 6 C) 7 D) 17 E) 24

10. $3x - 8 = 4x - 9$

$\Rightarrow$ **x = ?**

A) 1 B) $\frac{1}{8}$ C) $\frac{1}{9}$ D) 0 E) $-\frac{1}{7}$

11. $x(3 - 4) + x(2 - 14) + 39 = 0$

$\Rightarrow$ **x = ?**

A) 3 B) 1 C) 0 D) – 1 E) – 3

12. $5x(-5 + 6) + 4(x - 5) + (-5x) = 8$

$\Rightarrow$ **x = ?**

A) – 14 B) – 7 C) – 2 D) 7 E) 14

13. $\frac{x + 7}{4} = \frac{5}{3}$

$\Rightarrow$ **x = ?**

A) $\frac{1}{3}$ B) 0 C) $-\frac{1}{3}$ D) – 3 E) $-\frac{9}{2}$

14. $\frac{x + 3}{4} = \frac{2x + 5}{7}$

$\Rightarrow$ **x = ?**

A) 28 B) 21 C) 7 D) 1 E) – 1

15. $\frac{2(x - 4)}{3} = \frac{5(x + 1)}{8}$

$\Rightarrow$ **x = ?**

A) 79 B) 59 C) 24 D) – 59 E) – 79

16. $\frac{x + 1}{x + 3} = \frac{x + 4}{x + 2}$

$\Rightarrow$ **(x + 3) = ?**

A) $\frac{5}{2}$ B) $\frac{1}{2}$ C) 0 D) $-\frac{1}{2}$ E) $-\frac{5}{2}$

1-C 2-A 3-C 4-B 5-B 6-A 7-C 8-B 9-B 10-A 11-A 12-D 13-C 14-D 15-A 16-B

TEST 3

1. $2^3 + 3^2 - 8^0 = ?$

A) 17 B) 16 C) 15 D) 14 E) 10

2. $\left(\frac{1}{11}\right)^{-1} - \left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{0} = ?$

A) 8 B) 9 C) 11 D) 14 E) 16

3. $11^2 + 3^4 - (-7^0)^1 = ?$

A) 40 B) 41 C) 195 D) 203 E) 204

4. $(-3)^2 + (-3^2) + (-2)^3 + (-2^3) = ?$

A) 34 B) 25 C) 16 D) -7 E) -16

5. $(-7)^2 . (-13)^0 - 5^2 . (-2)^4 . \left[2 - \left(\frac{1}{2}\right)^{-1}\right] = ?$

A) 49 B) 24 C) 0 D) -73 E) -351

6. $(-2)^3 - (-3)^3 + 4^2 - \left(\frac{1}{5}\right)^{-1} = ?$

A) 45 B) 43 C) 40 D) 35 E) 30

7. $\left(\frac{1}{7}\right)^{-2} - \left(\frac{2}{4}\right)^{-4} + \left(-\frac{1}{3}\right)^{-3} = ?$

A) 92 B) 38 C) 6 D) -6 E) -92

8. $\left(\frac{1}{2}\right)^{-1} - \left(\frac{1}{3}\right)^{-1} - \left(\frac{1}{4}\right)^{-1} - \left(\frac{1}{5}\right)^{-1} = ?$

A) -12 B) -11 C) -10 D) 10 E) 11

9. $|-7| - |3| = ?$

A) -10 B) -4 C) -2 D) 4 E) 10

10. $|4-7| + |8-5| = ?$

A) 24 B) 6 C) 0 D) -6 E) -24

11. $|-4-3+10-8| = ?$

A) 25 B) 20 C) 10 D) 5 E) -5

12. $||-3| - |-5|| = ?$

A) -8 B) -2 C) 2 D) 8 E) 10

13. $|3 - |-4|| + |5 - |3-6|| = ?$

A) 3 B) 6 C) 7 D) 9 E) 15

14. $||12-15| + |13-18| - 43| = ?$

A) -35 B) -15 C) 15 D) 35 E) 51

15. $|4 . (-3) + 3 . (-2)| = ?$

A) -18 B) -6 C) 3 D) 6 E) 18

16. $||-5| - |-7|| + |-3| . (-2) = ?$

A) 8 B) 4 C) -4 D) -12 E) -18

1-B 2-A 3-D 4-E 5-A 6-E 7-C 8-C 9-D 10-B 11-D 12-C 13-A 14-D 15-E 16-C

1. $\dfrac{77 \,.\, 68 \,.\, 54 \,.\, 25}{51 \,.\, 55 \,.\, 63} = ?$

A) 20 B) 40 C) 50 D) 55 E) 85

2. $\dfrac{\left[(-3)^0 \,.\, 4^1\right]^2 - (-3)^2}{4^3 + (-2)^3 \,.\, 5 - (5^4)^0 \,.\, 10} = ?$

A) -2 B) $-\dfrac{1}{2}$ C) $-\dfrac{1}{3}$ D) $\dfrac{1}{2}$ E) 2

3. $3(x + y + 5) - 6[x - (x - y) + 2] - 3 = ?$

A) $3(x - y)$ B) $3x - 2y$ C) $3x + 30$ D) $-3x + 6y + 15$ E) $3(x - y) + 30$

4. $3x - x(9 - 4y) + 12xy - 3(4 - 2x) = ?$

A) $16x - 12y$ B) $12xy - 16$ C) $16xy - 12$ D) $12xy + 16$ E) $14xy + 16$

5. $x - \{2x - [4 - 3x + 5(x - 7)] - x\} - 2x + 16 = ?$

A) $2x - 31$ B) -15 C) $x - 15$ D) 15 E) $2x + 15$

6. $\dfrac{a^3b}{a^2b} + \dfrac{(a^2 + b)b^3}{ab^2} - \dfrac{b^2}{a} - \dfrac{ab^4}{b^3} = ?$

A) ab B) ab^2 C) $\dfrac{a}{b}$ D) a E) b

7. $(x - y)^3 + (y - x)^3 + (2x - 3)^2 - (2x - 4)^2 = ?$

A) $4x^2 - 28x + 28$ B) $4x^2 + 28x - 7$ C) $4x + 7$ D) $28x + 25$ E) $4x - 7$

8. $\dfrac{7(a - b) + 8(b - a)}{11(a - b) - 13(b - a)} = ?$

A) $-\dfrac{15}{2}$ B) $-\dfrac{1}{24}$ C) 0 D) $\dfrac{1}{24}$ E) $\dfrac{15}{2}$

9. $a = 8$

$b = 2$

$\Rightarrow$ $a - [(a : b) - a] + b = ?$

A) 16 B) 14 C) 10 D) 6 E) 2

10. $(-a)^3 . (-a)^2 . (-a)^0 . (a)^{-4} = ?$

A) $-a$ B) $-a^{-1}$ C) a^{-1} D) a E) a^{-2}

11. $(5 . 22222) - (10 . 11111) = ?$

A) 11000 B) 10100 C) 0 D) 10000 E) -11000

12. $20 - \{19 - [18 - (17 - 16)]\} = ?$

A) -18 B) -17 C) 16 D) 17 E) 18

13. $(16 : 8) : (4 : 2) = ?$

A) 16 B) 8 C) 4 D) 2 E) 1

14. $\dfrac{(2 : 1 - 14 : 7)}{3^8 - 5^4} = ?$

A) $-\dfrac{1}{56}$ B) 0 C) $\dfrac{1}{56}$ D) $\dfrac{1}{5936}$ E) $\dfrac{1}{7186}$

15. $\dfrac{(5^2 - 5^1 - 5^0) . (2^3 + 2^2 + 2^1 + 2^0)}{57} = ?$

A) $\dfrac{1}{57}$ B) $\dfrac{1}{15}$ C) $\dfrac{1}{5}$ D) 5 E) 15

16. $(-1040)^0 + (-1)^{123} - (-1913)^0 = ?$

A) -2 B) -1 C) 0 D) 1 E) 2

1-B 2-D 3-A 4-C 5-B 6-D 7-E 8-B 9-B 10-A 11-C 12-E 13-E 14-B 15-D 16-B

ÜNİTE 2

Unit 2

Rasyonel Sayılar / Rational Numbers

1. $x \in Z$

$$\frac{2x-1}{x-2}$$

basit kesir olduğuna göre, Σx kaçtır?

According to the simple fraction what is Σx?

A) -2 B) -1 C) 0 D) 1 E) 2

2. $x < 50$ ve $x \in Z^+$

$\frac{x}{13}$ bileşik kesir olduğuna göre, kaç adet x tam sayısı vardır?

$\frac{x}{13}$ is a compound fraction, how many x integer numbers there?

A) 76 B) 72 C) 70 D) 37 E) 35

3. $\frac{a-4}{2a+1} \in Z$ ve $\frac{2a+1}{a-4} \in Z$

$\Rightarrow$ **$\Sigma a = ?$**

A) -5 B) -4 C) -2 D) 0 E) 1

4. **a, b $\in Z^+$ olmak üzere aşağıdakilerden hangisi $a\frac{a}{b}$ kesrine denktir?**

Which of the following fractions is equivalent to $a\frac{a}{b}$ for a, b $\in Z^+$?

A) $\frac{16}{7}$ B) $\frac{15}{7}$ C) $\frac{13}{7}$ D) $\frac{12}{7}$ E) $\frac{11}{7}$

5. a ve b iki basamaklı pozitif tam sayılar olmak üzere,

$$\frac{a}{b} = \frac{20}{30}$$

denkliğini sağlayan $(a)_{max}$ kaçtır?

a and b are two - digit positive integers.

What is the max(a) value for this?

A) 88 B) 66 C) 64 D) 50 E) 44

6. $-3\frac{1}{2} = ?$

A) $-\frac{7}{2}$ B) $-\frac{5}{2}$ C) $-\frac{3}{2}$ D) $\frac{5}{2}$ E) $\frac{7}{2}$

7. I. $\frac{18}{4} = 4\frac{2}{4}$

II. $4\frac{2}{4} = 2\frac{1}{2}$

III. $2\frac{1}{2} = 2 + \frac{1}{2}$

IV. $2 + \frac{1}{2} = \frac{4}{2} + \frac{1}{2}$

V. $\frac{5}{2} = \frac{4}{2} + \frac{1}{2}$

İlk hata hangi adımda yapılmıştır?

In which step was the first mistake made?

A) I B) II C) III D) IV E) V

8. $\left.\begin{array}{l} x = 3\frac{4}{7} \\ y = 4\frac{3}{7} \end{array}\right\} \Rightarrow x + y = ?$

A) $\frac{56}{7}$ B) $\frac{31}{7}$ C) $\frac{25}{7}$ D) $\frac{25}{4}$ E) $\frac{25}{3}$

9. $2\frac{2}{5} + 2\frac{3}{5} + 2\frac{4}{5} + 3 + 2\frac{6}{5} = ?$

A) 10 B) 13 C) 14 D) 16 E) 20

10. $1\frac{1}{2} - \frac{3}{2} + 2\frac{1}{3} + \frac{2}{3} = ?$

A) $6\frac{3}{4}$ B) $6\frac{2}{3}$ C) $6\frac{1}{2}$ D) 6 E) 3

11. $4^{\frac{3\frac{1}{2}}{5}} = ?$

A) $\frac{22}{5}$ B) $\frac{23}{5}$ C) $\frac{28}{5}$ D) $\frac{47}{10}$ E) $\frac{48}{10}$

12. $\dfrac{4\frac{3}{5}}{2 + 2\frac{3}{5}} = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

13. $a + \frac{9}{7} = 4\frac{2}{7} \Rightarrow a^{\frac{a}{a+1}} = ?$

A) 2 B) $\frac{15}{7}$ C) $\frac{15}{6}$ D) 3 E) $\frac{15}{4}$

14. $a, b \in N$

$\frac{4}{5} = \frac{8}{10} = \ldots = \frac{a}{b}$

$a < 100 \Rightarrow (a + b)_{max} = ?$

A) 225 B) 216 C) 169 D) 162 E) 153

15. $2\frac{2}{3} - 2\frac{3}{2} + \frac{7}{2} - \frac{8}{3} = ?$

A) $-\frac{10}{6}$ B) $-\frac{5}{6}$ C) 0 D) $\frac{5}{6}$ E) $\frac{10}{6}$

1-C 2-D 3-B 4-A 5-B 6-A 7-B 8-A 9-C 10-E 11-D 12-E 13-E 14-B 15-C

1. $\dfrac{2}{\dfrac{1}{7}-\dfrac{4}{3+\dfrac{1}{2}}} = ?$

A) -2 B) -1 C) 0 D) 1 E) 2

2. $\dfrac{2+\dfrac{3}{1-\dfrac{1}{2}}}{2+\dfrac{3}{1+\dfrac{1}{2}}} = ?$

A) 8 B) 6 C) 4 D) 2 E) 1

3. $\dfrac{\dfrac{2+a}{2-a}+1}{\dfrac{2+2a}{2-a}+2} = ?$

A) $\dfrac{1}{3}$ B) $\dfrac{2}{3}$ C) 1 D) $\dfrac{3}{4}$ E) $\dfrac{4}{5}$

4. $\left(\dfrac{1}{3}+\dfrac{7}{4}-\dfrac{1}{7}\right)-\left(\dfrac{4}{3}+\dfrac{7}{4}+\dfrac{6}{7}\right) = ?$

A) -3 B) -2 C) -1 D) 0 E) 2

5. $\left.\begin{array}{l} A = \dfrac{2}{11}+\dfrac{4}{3}+\dfrac{5}{8} \\ B = \dfrac{9}{11}-\dfrac{8}{6}+\dfrac{11}{8} \end{array}\right\}$ $B = ?$

A) $3 + A$ B) $2 + A$ C) $3 - A$ D) $3A$ E) $\dfrac{2A}{3}$

6. $\left.\begin{array}{l} A = \dfrac{10}{11}+\dfrac{1}{7}+\dfrac{7}{13} \\ B = \dfrac{4}{11}+\dfrac{2}{7}+\dfrac{2}{13} \end{array}\right\}$ $A + x \,.\, B = 4 \Rightarrow x = ?$

A) -2 B) -1 C) 1 D) 2 E) 3

7. $\dfrac{\left(\dfrac{1}{3}+4\right)-\left(\dfrac{2}{6}+7\right)}{\left(\dfrac{1}{5}-2\right)+\left(5-\dfrac{2}{10}\right)} = ?$

A) $\dfrac{1}{3}$ B) 0 C) $-\dfrac{1}{3}$ D) -1 E) $-\dfrac{3}{4}$

8. $2019\,\dfrac{2021}{2020} - 2020\,\dfrac{1}{2020} = ?$

A) 2019 B) 2018 C) 2012 D) 1 E) 0

9. $\frac{41}{123}+\frac{19}{76}-\frac{13}{52}+\frac{34}{51}=?$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) $\frac{5}{3}$

10. $\frac{16}{51}:\frac{8}{17}\cdot\frac{15}{22}=?$

A) $\frac{19}{51}$ B) $\frac{8}{17}$ C) $\frac{9}{22}$ D) $\frac{5}{11}$ E) $\frac{1}{2}$

11. $\frac{2}{\frac{7}{3}}-\frac{\frac{2}{7}}{3}=?$

A) $-\frac{16}{21}$ B) $-\frac{11}{21}$ C) 0 D) $\frac{11}{21}$ E) $\frac{16}{21}$

12. $\frac{1}{3}\cdot\frac{2}{7}:\frac{4}{14}+\frac{1}{2}=?$

A) $\frac{2}{7}$ B) $\frac{5}{6}$ C) $\frac{7}{6}$ D) $\frac{3}{2}$ E) $\frac{7}{2}$

13. $\left[\frac{2}{7}:\left[\frac{1}{2}+\frac{3}{7}\right]\right]\cdot\frac{12}{5}=?$

A) $\frac{48}{65}$ B) $\frac{12}{13}$ C) $\frac{13}{12}$ D) $\frac{9}{13}$ E) 1

14. $\dfrac{\frac{17}{12}+\frac{19}{9}+\frac{13}{8}}{\frac{34}{12}+\frac{38}{9}+\frac{26}{8}}=?$

A) 2 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{12}$

15. $\dfrac{\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)}{\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)}=?$

A) 6 B) 8 C) 9 D) 10 E) 12

16. $\left[\left(\frac{1}{3}+\frac{1}{4}\right):\frac{7}{12}\right]\cdot\left(\frac{1}{6}+\frac{1}{3}+\frac{1}{2}\right)=?$

A) $\frac{1}{3}$ B) 1 C) $\frac{13}{12}$ D) $\frac{17}{12}$ E) $\frac{19}{12}$

1-A 2-D 3-B 4-B 5-C 6-E 7-D 8-E 9-C 10-D 11-E 12-B 13-A 14-B 15-D 16-B

1. $1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4}}}}=?$

A) $\frac{23}{14}$ B) $\frac{10}{7}$ C) $\frac{17}{7}$ D) $\frac{7}{10}$ E) $\frac{14}{23}$

2. $4+\cfrac{4+\cfrac{\iddots}{3}}{4+\cfrac{3}{3}}=?$

A) 7 B) 6 C) 5 D) 4 E) 3

3. $2+\cfrac{x}{2+\cfrac{x}{2+\cfrac{x}{2+\cfrac{x}{\vdots}}}}=3 \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $x+\cfrac{4}{x+\cfrac{4}{x+\cfrac{4}{x+\cfrac{4}{\vdots}}}}=4 \Rightarrow x=?$

A) 3 B) 4 C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) 1

5. $\left.\begin{array}{l} a=\frac{17}{15} \\ b=\frac{21}{19} \\ c=\frac{19}{17} \end{array}\right\} \Rightarrow ?>?>?$

A) b > c > a B) b > a > c C) a > b > c
D) a > c > b E) c > a > b

6. $\left.\begin{array}{l} x=\frac{99}{10} \\ y=\frac{999}{100} \\ z=\frac{9999}{1000} \end{array}\right\} \Rightarrow ?>?>?$

A) x > y > z B) x > z > y C) z > y > x
D) z > x > y E) y > z > x

7. $\left.\begin{array}{l} a=-\frac{2}{3} \\ b=-\frac{13}{3} \\ c=-\frac{41}{3} \end{array}\right\} \Rightarrow ?>?>?$

A) c > b > a B) a > b > c C) a > c > b
D) c > a > b E) b > c > a

8. $x < y < 0 < z$

$$\left.\begin{array}{l} a = \dfrac{x}{y} \\ b = \dfrac{z}{y} \\ c = \dfrac{z}{x} \end{array}\right\} \Rightarrow ? > ? > ?$$

A) $a > c > b$ B) $a > b > c$ C) $b > c > a$

D) $b > a > c$ E) $c > a > b$

9. $a = \dfrac{2}{1 - \dfrac{1}{4}}$

$b = \dfrac{3}{2 + \dfrac{1}{3}}$

$c = \dfrac{1 - \dfrac{1}{3}}{4}$

$\Rightarrow$ **? > ? > ?**

A) $b > c > a$ B) $a > b > c$ C) $b > a > c$

D) $a > c > b$ E) $c > a > b$

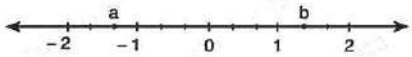
10. $x < 0$

$$\left.\begin{array}{l} a = \dfrac{x}{3} \\ b = -\dfrac{x}{4} \\ c = -\dfrac{x}{5} \end{array}\right\} \Rightarrow ? > ? > ?$$

A) $a > b > c$ B) $a > c > b$ C) $b > c > a$

D) $b > a > c$ E) $c > a > b$

11.



– 2 ile 2 arasında 12 eşit aralık vardır.

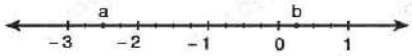
Buna göre, $\dfrac{a}{b} = ?$

There are 12 equal ranges from – 2 to 2

Accordingly, what is $\dfrac{a}{b}$?

A) $-\dfrac{5}{3}$ B) $-\dfrac{4}{3}$ C) -1 D) $\dfrac{1}{3}$ E) $\dfrac{4}{3}$

12.



– 3 ile 1 arasında 16 eşit aralık vardır.

Buna göre, (a + b) = ?

There are 16 equal ranges from – 3 to 1

Accordingly, what is (a + b)?

A) $-\dfrac{9}{4}$ B) $-\dfrac{5}{4}$ C) $-\dfrac{4}{4}$ D) 1 E) $\dfrac{1}{4}$

13. $a, b, c \in Z$

$$a + \frac{1}{b + \dfrac{3}{c}} = \frac{13}{8}$$

$\Rightarrow$ **a + b + c = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

14. $a, b, c \in Z$

$$\frac{41}{14} = a + \frac{1}{b + \dfrac{1}{c}}$$

$\Rightarrow$ **a . b . c = ?**

A) 13 B) 16 C) 26 D) 27 E) 29

1-A 2-B 3-C 4-A 5-D 6-C 7-B 8-A 9-B 10-C 11-C 12-A 13-D 14-C

1. $(4{,}15) + (2{,}14) + (3{,}07) = ?$

A) 9,35 B) 9,36 C) 9,63 D) 9,69 E) 9,99

2. $(0{,}412) - (0{,}07) = ?$

A) 0,342 B) 0,432 C) 0,423 D) 0,23 E) 0,234

3. $(0{,}13) \,.\, (2{,}14) = ?$

A) 128,72 B) 72,82 C) 27,82 D) 0,2872 E) 0,2782

4. $(2{,}34) : (0{,}3) = ?$

A) 78 B) 74 C) 39 D) 8,7 E) 7,8

5. $\dfrac{0{,}112}{0{,}14} + \dfrac{2{,}47}{1{,}3} = ?$

A) 1,1 B) 1,6 C) 1,7 D) 2,7 E) 2,9

6. $\dfrac{\dfrac{0{,}15}{1{,}05} + \dfrac{13{,}5}{1{,}5}}{\dfrac{1{,}7}{1{,}19}} = ?$

A) 6,4 B) 6,3 C) 5,7 D) 1,7 E) 1,9

7. $\dfrac{2}{0{,}001} + \dfrac{3}{0{,}02} + \dfrac{4}{0{,}5} = ?$

A) 2118 B) 2158 C) 2185 D) 2518 E) 2581

8. $\dfrac{4}{(5{,}319 + 0{,}31 \,.\, 0{,}1)} + \dfrac{20}{107} = ?$

A) $\dfrac{10}{107}$ B) $\dfrac{100}{107}$ C) 1 D) $\dfrac{17}{12}$ E) 107

9. $\dfrac{\dfrac{0,41}{1,23}}{\dfrac{1,8}{0,72}+\dfrac{1,3}{0,39}} = ?$

A) $\frac{4}{70}$ B) $\frac{4}{7}$ C) $\frac{3}{7}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

10. $\dfrac{\dfrac{0,7}{0,02}+\dfrac{0,8}{0,05}+\dfrac{6,8}{0,2}}{\dfrac{1,7}{0,02}} = ?$

A) 19 B) 17 C) $\frac{17}{8}$ D) $\frac{17}{14}$ E) 1

11. $\dfrac{0,03}{0,003}+\dfrac{0,35}{0,7}+\dfrac{7}{20} = ?$

A) 19,35 B) 11,95 C) 11,85 D) 11,35 E) 10,85

12. $\left(\dfrac{4,25}{1,7}+\dfrac{1,44}{3,2}\right) : \dfrac{1,77}{0,2} = ?$

A) $\frac{7}{2}$ B) 3 C) 1 D) $\frac{1}{3}$ E) $\frac{1}{4}$

13. $\dfrac{0,77}{\dfrac{0,007}{0,7}} \cdot (0,7)^{-1} = ?$

A) 110 B) 17 C) 11 D) 10 E) 1

14. $\dfrac{(0,2)^2+(0,3)^2}{(0,4)^2+(0,5)^2+0,11} \cdot (0,01)^{-1} = ?$

A) 111 B) 100 C) 25 D) $\frac{1}{25}$ E) $\frac{1}{4}$

15. $\dfrac{(0,1)^{-1}}{(0,01)^{-1}}+\dfrac{(0,02)^{-1}}{(0,2)^{-1}} = ?$

A) 12 B) 11 C) 10,1 D) 10,01 E) 1,01

16. $0,3+\dfrac{0,3+\dfrac{0,3+\frac{\cdot^{\cdot^{\cdot}}}{4}}{4}}{4} = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

1-B 2-A 3-E 4-E 5-D 6-A 7-B 8-B 9-A 10-E 11-E 12-D 13-A 14-C 15-C 16-B

1. $\left(\frac{0,077}{0,77}\right)^{-3} + \left(\frac{0,015}{1,5}\right)^{-2} + \left(\frac{4,14}{0,414}\right) + \left(\frac{1,8}{18}\right)^{-2} = ?$

A) 11111 B) 11110 C) 11100 D) 1110 E) 111

2. $a = 0,1 + 0,11 + 0,111$

$b = 0,2 + 0,22 + 0,222$

$\Rightarrow \frac{a}{b} + \frac{b}{a} = ?$

A) 3 B) $\frac{5}{2}$ C) 1 D) $\frac{1}{3}$ E) $\frac{1}{9}$

3. $2 + \dfrac{4 + \frac{2 - 0,8}{0,3}}{0,8} = ?$

A) 12 B) 10 C) 8 D) $\frac{8}{3}$ E) $\frac{3}{8}$

4. $(0,006 - 0,03) \,.\, (0,3)^{-3} = ?$

A) $\frac{9}{8}$ B) $\frac{8}{9}$ C) $\frac{3}{8}$ D) $-\frac{8}{9}$ E) -1

5. $x = \frac{9}{10} + \frac{9}{100} + \frac{9}{1000}$

$\Rightarrow (x + 0,001)^{-1} = ?$

A) 999 B) 99 C) 1 D) 0,99 E) 0,999

6. $\frac{xy,zm}{xyz,m} + \frac{x,yzm}{xyz,m} + \frac{x,yzm}{xy,zm} = ?$

A) 111 B) 12,2 C) 11,2 D) 2,1 E) 0,21

7. $\frac{x}{0,x} + \frac{x}{0,0x} + \frac{x}{0,00x} = ?$

A) 10 B) 100 C) 110 D) 1100 E) 1110

8. $x = 3,414$

$y = 2,293$

$\Rightarrow x^2 + 4xy + 4y^2 = ?$

A) 64 B) 36 C) 31,438449 D) 25 E) 5,607

9. $\frac{1}{90} + \frac{1}{110} + \frac{1}{132} = ?$

A) $\frac{1}{120}$ B) $\frac{2}{99}$ C) $\frac{1}{110}$ D) $\frac{1}{96}$ E) $\frac{1}{36}$

10. $\left(1 - \frac{1}{2^2}\right) \cdot \left(1 - \frac{1}{3^2}\right) \cdot \left(1 - \frac{1}{4^2}\right) \cdots \left(1 - \frac{1}{8^2}\right) = \frac{A}{16}$

$\Rightarrow$ **A = ?**

A) 9 B) 8 C) 4 D) $\frac{1}{8!}$ E) $\frac{1}{641}$

11. $\left(\frac{7}{x^2 + 6x + 10}\right) \in Q$

$\Rightarrow \left(\frac{7}{x^2 + 6x + 10}\right)_{max} = ?$

A) 8 B) 7 C) $\frac{10}{3}$ D) $\frac{9}{4}$ E) 1

12. $\dfrac{2 - \frac{y}{x}}{\frac{1}{2} - \frac{x}{y}} + \frac{y}{x} = ?$

A) 1 B) 0 C) $\frac{x}{y}$ D) $-\frac{y}{x}$ E) $-\frac{x}{y}$

13. $\dfrac{3.10^{-4} + 0{,}07 \,.\, 10^{-2}}{0{,}8 \,.\, 10^{-4} + 0{,}02 \,.\, 10^{-3}} = ?$

A) $\frac{1}{100}$ B) $\frac{1}{10}$ C) 1 D) 10 E) 100

14. $\dfrac{0{,}2 + \dfrac{0{,}1}{0{,}4 + \dfrac{1}{0{,}4}}}{\dfrac{0{,}017}{1{,}45}} = ?$

A) 200 B) 170 C) 34 D) 20 E) 17

15. $\left(\frac{7a + 3}{4 - a}\right) \in Q$

$\Rightarrow$ **(a + 2) ne <u>olamaz</u>?**

What <u>can't</u> be (a + 2)?

A) 4 B) 6 C) 7 D) 14 E) 31

16. $\frac{8x - 7}{3x} + \frac{5 + 8y}{3y} + \frac{7y - 5x}{3xy} = ?$

A) $\frac{7}{3}$ B) $\frac{8}{3}$ C) $\frac{16}{3}$ D) $\frac{17}{3}$ E) 0

1-B 2-B 3-A 4-D 5-C 6-E 7-E 8-A 9-E 10-A 11-B 12-D 13-D 14-D 15-B 16-C

1. $a = 4,5\overline{231}$

$b = 4,5\overline{231}$

$c = 4,52\overline{31}$

$d = 4,523\overline{1}$

$\Rightarrow$ **? > ? > ? > ?**

A) b > c > d > a B) b > c > a > d

C) c > a > b > d D) a > c > b > d

E) a > b > c > d

2. $\frac{3}{11} + \frac{12}{25} + \frac{13}{30} = x$

$\Rightarrow$ $\frac{5}{11} + \frac{1}{25} + \frac{4}{30} = ?$

A) 3 + x B) x − 3 C) 3x − 2 D) 3 + 2x E) 3 − 2x

3. $\frac{a}{10} + \frac{a}{100} + \frac{a}{1000} + \frac{a}{10000} + \ldots = \frac{4}{9}$

$\Rightarrow$ **a = ?**

A) 9 B) 7 C) 6 D) 5 E) 4

4. $\dfrac{\frac{1}{5} + \frac{4}{7} + \frac{12}{17}}{\frac{4}{25} + \frac{16}{35} + \frac{48}{85}} = ?$

A) 2 B) $\frac{3}{2}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$ E) $\frac{2}{3}$

5. $\left(x + \frac{1}{8}\right) \in Z$

$\Rightarrow$ **x = ?**

A) ...,857 B) ...,875 C) ...,975 D) 0,785 E) ...,865

6. $a, b \in N$

$\left(\frac{2a+1}{b-3}\right) \in Z$

$\left(\frac{b-3}{2a+1}\right) \in Z$

$\Rightarrow$ **min(a + b) = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

7. $x = 0,888\ldots$

$y = 0,777\ldots$

$\Rightarrow$ **x + y + z = 2 $\Rightarrow$ z = ?**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $0,\overline{13}$ E) $1,\overline{3}$

8. $\left(3+\frac{3}{2}\right) \cdot \left(4+\frac{4}{3}\right) \cdot \left(5+\frac{5}{4}\right) \cdot \left(6+\frac{6}{5}\right) \ldots \left(20+\frac{20}{19}\right) = ?$

A) 5 . 19! B) 10 . 20! C) 5 . 20! D) 20! E) $\frac{20!}{19}$

9. $3,8\overline{3} = ?$

A) $\frac{30}{11}$ B) $\frac{115}{33}$ C) $\frac{38}{9}$ D) $\frac{23}{6}$ E) $\frac{10}{3}$

10. $13,424242\ldots = ?$

A) $13\frac{14}{33}$ B) $\frac{1311}{99}$ C) $13\frac{7}{15}$ D) $\frac{1342}{99}$ E) $\frac{1300}{99}$

11. $2,\overline{35} + 4,\overline{22} - 1,\overline{15} = ?$

A) $6,\overline{45}$ B) $4,\overline{52}$ C) $5,\overline{42}$ D) $5,\overline{24}$ E) $5,\overline{42}$

12. $\frac{0,\overline{4444}}{0,\overline{3333}} + \frac{0,\overline{222}}{0,\overline{111}} + \frac{0,\overline{66666}}{0,\overline{555}} = ?$

A) $5,\overline{53}$ B) $4,5\overline{3}$ C) $4,\overline{53}$ D) $3,\overline{54}$ E) $3,\overline{45}$

13. $4,\overline{9} + 5,\overline{9} + 6,\overline{99} + 7,\overline{999} = ?$

A) 22 B) 23 C) 24 D) 25 E) 26

14. $\frac{4,\overline{4} + 5,\overline{5} + 6,\overline{6}}{1,\overline{1} + 2,\overline{2} + 3,\overline{3}} = ?$

A) $1,\overline{6}$ B) $1,\overline{8}$ C) 2 D) 2,5 E) 2,7

15. $0,12 + 0,0012 + 0,000012 + \ldots = ?$

A) $\frac{4}{33}$ B) $\frac{3}{25}$ C) $\frac{4}{3}$ D) $\frac{1}{9}$ E) $\frac{7}{33}$

16. $\frac{x,\overline{x0}}{x,\overline{0x}} + \frac{x,0\overline{x}}{x,x\overline{x}} = ?$

A) $\frac{x}{9}$ B) $\frac{xx}{90}$ C) 2 D) 1 E) $\frac{11}{90}$

1-D 2-E 3-E 4-D 5-B 6-D 7-B 8-C 9-D 10-A 11-E 12-B 13-E 14-D 15-A 16-C

ÜNİTE 3

Unit 3

I. Dereceden Denklemler / First Degree Equations

1. $3x - 12 = 18$

$\Rightarrow$ **x = ?**

A) 10 B) 8 C) 6 D) 4 E) 2

2. $13x - 7 = 8x + 8$

$\Rightarrow$ **x = ?**

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) 1 D) 3 E) 5

3. $4x + 5(8 - 3x) = 13x - 56$

$\Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) $\frac{9}{2}$ E) $\frac{11}{2}$

4. $5x - 4(3 - 2x) + 7(x + 4) = x(3 - 7) + 16$

$\Rightarrow$ **x = ?**

A) 4 B) 2 C) $\frac{3}{2}$ D) 0 E) -1

5. $x(2 - 3 + 5) + 4(x - 7x + 11) = -13x + 30$

$\Rightarrow$ **x = ?**

A) 2 B) 1 C) 0 D) -1 E) -2

6. $x + 3x + 5x - 7 + 4 = 7x - 3 - 5 + 7$

$\Rightarrow$ **x = ?**

A) $\frac{4}{5}$ B) 1 C) $\frac{3}{2}$ D) $\frac{9}{8}$ E) 2

7. $\frac{4}{3}(x - 6) + \frac{1}{2}(x + 4) = 5$

$\Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 8

8. $-4(x + 1) + 6\left(-x - \frac{1}{2}\right) = x + 2$

$\Rightarrow$ **x = ?**

A) $\frac{11}{9}$ B) $\frac{9}{11}$ C) 0 D) $-\frac{9}{11}$ E) $-\frac{11}{9}$

9. $\frac{x+2}{3} = 4$

$\Rightarrow$ **x = ?**

A) 14 B) 12 C) 10 D) – 10 E) – 12

10. $\frac{12}{x+3} = 4$

$\Rightarrow$ **x = ?**

A) 0 B) $\frac{1}{3}$ C) 1 D) 3 E) 4

11. $\frac{x+2}{7} = \frac{x-1}{3}$

$\Rightarrow$ **x = ?**

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{4}{13}$ D) 3 E) $\frac{13}{4}$

12. $\frac{8}{x+3} = \frac{7}{x-4}$

$\Rightarrow$ **x = ?**

A) – 53 B) – 9 C) $\frac{1}{9}$ D) 9 E) 53

13. $\frac{2x+11}{4} = x + \frac{4}{3}$

$\Rightarrow$ **x = ?**

A) 3 B) $\frac{17}{6}$ C) $\frac{6}{17}$ D) $-\frac{6}{17}$ E) $-\frac{17}{6}$

14. $\frac{8x-1}{4} = x - 7$

$\Rightarrow$ **x = ?**

A) $\frac{29}{4}$ B) $\frac{27}{4}$ C) 6 D) $-\frac{27}{4}$ E) $-\frac{29}{4}$

15. $\frac{11x}{3} + 4 = \frac{12x}{7} - 37$

$\Rightarrow$ **x = ?**

A) – 41 B) – 40 C) – 21 D) $\frac{1}{21}$ E) 21

16. $\frac{x+30}{5} = x + 4$

$\Rightarrow$ **x = ?**

A) $\frac{25}{3}$ B) $\frac{10}{3}$ C) $\frac{5}{2}$ D) $-\frac{5}{2}$ E) $-\frac{25}{3}$

1-A 2-D 3-C 4-D 5-A 6-B 7-D 8-D 9-C 10-A 11-E 12-E 13-B 14-D 15-C 16-C

1. $\frac{x}{7} + \frac{x}{2} = 18$

$\Rightarrow$ **x = ?**

A) 14 B) 18 C) 20 D) 24 E) 28

2. $\frac{x+2}{5} + \frac{x-1}{4} = \frac{12}{5}$

$\Rightarrow$ **x = ?**

A) – 5 B) – 3 C) 0 D) 5 E) 9

3. $\frac{x}{2} + \frac{x}{3} + \frac{x}{4} - \frac{x}{5} - \frac{x}{6} = \frac{43}{120}$

$\Rightarrow$ **x = ?**

A) 2 B) $\frac{1}{2}$ C) 0 D) $-\frac{1}{2}$ E) 2

4. $\frac{2}{3}(x+1) + \frac{4}{3}(x-2) = -4$

$\Rightarrow$ **x = ?**

A) $\frac{4}{3}$ B) 1 C) $\frac{3}{4}$ D) – 1 E) $-\frac{3}{4}$

5. $7 + \frac{x}{3} = 4 + \frac{x}{5}$

$\Rightarrow$ **x = ?**

A) $-\frac{45}{2}$ B) $-\frac{45}{3}$ C) $-\frac{2}{45}$ D) $-\frac{3}{45}$ E) $-\frac{4}{45}$

6. $5 - \frac{7}{x} = 2 - \frac{3}{x}$

$\Rightarrow$ **x = ?**

A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) $\frac{8}{3}$ D) 3 E) 7

7. $\frac{4}{5} + 2\left(\frac{x}{6} + \frac{x}{5}\right) = \frac{x}{3} + \frac{4}{30}$

$\Rightarrow$ **x = ?**

A) $-\frac{2}{3}$ B) $-\frac{3}{5}$ C) $-\frac{5}{3}$ D) – 2 E) $-\frac{7}{3}$

8. $\frac{x}{x-7} + 3 = \frac{7}{x-7} + x$

$\Rightarrow$ **x = ?**

A) 7 B) 5 C) 4 D) 3 E) $\frac{1}{3}$

9. $\frac{3}{4-x} + x + 2 = \frac{7-x}{4-x} + 2x - 5$

$\Rightarrow$ **x = ?**

A) 7 B) 6 C) 5 D) – 6 E) – 7

10. $\frac{x+1}{x-3} + x - 5 = \frac{2x-2}{x-3} + \frac{1}{4}$

$\Rightarrow$ **x = ?**

A) $\frac{14}{2}$ B) $\frac{27}{4}$ C) $\frac{13}{2}$ D) $\frac{25}{4}$ E) 6

11. $(x-3).(x+4) = (x-3)$

$\Rightarrow$ **S.S. = ?**

A) $\{-4\}$ B) $\{3\}$ C) $\{-3\}$ D) $\{-4, 3\}$ E) $\{-3, 3\}$

12. $x - 6 = x^2 - 36$

$\Rightarrow$ **S.S. = ?**

A) $\{-5, 6\}$ B) $\{-6, 6\}$ C) $\{6\}$ D) $\{7\}$ E) $\{-6, 7\}$

13. $\frac{x+3}{x^2-9} = 2$

$\Rightarrow$ **S.S. = ?**

A) $\{-3, 3\}$ B) $\{-3\}$ C) $\left\{\frac{7}{2}\right\}$ D) $\varnothing$ E) $\left\{\frac{7}{3}, 3\right\}$

14. $(x+2).(x+16) = (x^2-4)$

$\Rightarrow$ **S.S. = ?**

A) $\{-2\}$ B) $\{-2, 2\}$ C) $\{-16, -2, 2\}$ D) $\{7, 9\}$ E) $\{-16, -2, 7\}$

15. $\frac{(x-14).(x+14)}{(x+14)} = 2$

$\Rightarrow$ **S.S. = ?**

A) $\{-14\}$ B) $\{-14, 16\}$ C) $\{16\}$ D) $\{14, 16\}$ E) $\{-14, 14\}$

16. $\frac{(x-3).(x+2)}{(3-x)} = 4$

$\Rightarrow$ **S.S. = ?**

A) $\{3, -6\}$ B) $\{-6\}$ C) $\{-3, 3\}$ D) $\{-2, 3\}$ E) $\{-3, -2, 3\}$

1-E 2-D 3-B 4-D 5-A 6-B 7-C 8-C 9-B 10-D 11-E 12-A 13-C 14-A 15-C 16-B

1. $x + y = 7$

$x - y = 9$

$\Rightarrow$ **x = ?**

A) 1 B) 4 C) 7 D) 8 E) 9

2. $3x - y = 4$

$-x + y = 6$

$\Rightarrow$ **y = ?**

A) 3 B) 4 C) 5 D) 6 E) 11

3. $a + 3b = 7$

$2a - b = 7$

$\Rightarrow$ **(a . b) = ?**

A) 1 B) 4 C) 8 D) 12 E) 16

4. $2a - 3b = 4$

$a + 2b = 12$

$\Rightarrow \frac{a}{b} = ?$

A) $\frac{11}{5}$ B) $\frac{11}{4}$ C) $\frac{4}{5}$ D) $\frac{4}{11}$ E) $\frac{5}{11}$

5. $\frac{1}{x} + \frac{1}{y} = 2$

$\frac{2}{x} - \frac{1}{y} = -\frac{1}{2}$

$\Rightarrow$ **y = ?**

A) 2 B) $\frac{3}{2}$ C) $\frac{2}{3}$ D) $\frac{1}{3}$ E) $\frac{1}{6}$

6. $\frac{4}{x} - \frac{3}{y} = \frac{1}{5}$

$\frac{2}{x} - \frac{2}{y} = \frac{1}{12}$

$\Rightarrow$ **y = ?**

A) $\frac{1}{30}$ B) $\frac{1}{15}$ C) 1 D) 15 E) 30

7. $\frac{3}{x} + \frac{5}{y} = 2$

$\frac{4}{x} + \frac{2}{y} = 5$

$\Rightarrow \frac{1}{x} + \frac{1}{y} = ?$

A) 1 B) $\frac{1}{7}$ C) $\frac{1}{14}$ D) $\frac{1}{15}$ E) $\frac{1}{16}$

8. $2x + 3y = 4$

$3x + 2y = 15$

$\Rightarrow$ **x − y = ?**

A) 19 B) 11 C) $\frac{9}{4}$ D) $\frac{9}{5}$ E) $\frac{1}{5}$

9. $3x + 5 = x(7 - a) + 2$

S.S = ∅

⇒ **a = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

10. $8x - 4(2 - x) = ax + 11$

S.S. = ∅

⇒ **a = ?**

A) 16 B) 12 C) 11 D) 8 E) 4

11. $3x + 7(5 - 4x) + 25x = k$

S.S. = R

⇒ **k = ?**

A) – 28 B) 25 C) 28 D) 35 E) 38

12. $-2x + x(4 + 3) + a = 5x + 12$

S.S. = R

⇒ **a = ?**

A) – 4 B) 2 C) 9 D) 5 E) 12

13. $a + x + y = 15$

$(x, y) = (2, 4)$

⇒ **a = ?**

A) 2 B) 4 C) 6 D) 9 E) 10

14. $4x + 6y - m = 0$

$(x, y) = (4, -3)$

⇒ **m = ?**

A) 2 B) 1 C) – 2 D) – 3 E) – 5

15. $(3 - a)x + (b - 2)y = 0$

$n(S.S.) = \infty$

⇒ **a + b = ?**

A) 5 B) 6 C) 8 D) 9 E) 10

16. $(4 - m)x + (2 + n)y = 7x + 3y$

$n(S.S.) = \infty$

⇒ **(m, n) = ?**

A) (– 3, – 1) B) (3, 1) C) (1, 3) D) (– 1, 3) E) (– 3, 1)

1-D 2-E 3-B 4-A 5-C 6-E 7-A 8-B 9-A 10-B 11-D 12-E 13-D 14-C 15-A 16-E

1. $\left.\begin{array}{l} x - 3y = 4 \\ 2x + ax = b \end{array}\right\}$ n(S.S.) = ∞

⇒ **a + b = ?**

A) – 6 B) – 2 C) 4 D) 2 E) 8

2. $\left.\begin{array}{l} x + (3 + b)y = 4 \\ (a + 1)x + 2y = 2 \end{array}\right\}$ n(S.S.) = ∞

⇒ **(a . b) = ?**

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) 1 D) $\frac{5}{2}$ E) 3

3. $\left.\begin{array}{l} ax + 3y = 4x + 1 \\ 2x + 4y = 5 \end{array}\right\}$ S.S. = ∅

⇒ **a = ?**

A) $\frac{13}{3}$ B) $\frac{11}{2}$ C) $\frac{8}{3}$ D) $-\frac{8}{3}$ E) – 2

4. $\left.\begin{array}{l} (a + 1)x + 4y = 3y - 2 \\ 3x + (a - 1)y = 5 \end{array}\right\}$ S.S. = ∅

⇒ **a^2 = ?**

A) – 2 B) – 1 C) 2 D) 3 E) 4

5. $2x - 3y = 12$

⇒ **y = ?**

A) $\frac{2x + 12}{3}$ B) $\frac{2x - 12}{3}$ C) $\frac{2x - 3}{12}$ D) $\frac{2x - 12}{2}$ E) $\frac{3x + 12}{2}$

6. $3x - 4xy = 5y - 4$

⇒ **x = ?**

A) $\frac{5y - 4}{3y - 4}$ B) $\frac{5y - 4}{3y + 4}$ C) $\frac{5y - 4}{3 - 4y}$ D) $\frac{5 - 4y}{3 - 4y}$ E) $\frac{4 - 5y}{3 - 4y}$

7. $x - 4xy = 5 + y$

⇒ **y = ?**

A) $\frac{x - 5}{1 + 4x}$ B) $\frac{x - 5}{x + 4}$ C) $\frac{x + 5}{1 + 4x}$ D) $\frac{x + 5}{1 - 4x}$ E) $\frac{x - 5}{1 - 4x}$

8. $a + ab = b - 3a + 4$

⇒ **a = ?**

A) $\frac{b + 3}{b - 4}$ B) $\frac{b + 2}{b - 3}$ C) $\frac{b - 3}{b + 2}$ D) 1 E) 2

9. $x + y = 4$

$y + z = 3$

$z + x = 2$

$\Rightarrow$ **y = ?**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) $\frac{4}{2}$ E) $\frac{5}{2}$

10. $(x - 4)^2 + (y + 3)^2 = 0$

$\Rightarrow$ **x . y = ?**

A) – 12 B) – 3 C) – 1 D) 7 E) 12

11. $(a - b)^2 + (b - 4)^2 + (c - 3)^2 = 0$

$\Rightarrow$ **a + b + c = ?**

A) 8 B) 9 C) 11 D) 12 E) 13

12. $7 + \dfrac{5}{6 - \dfrac{12}{13 + a}} = 8$

$\Rightarrow$ **a = ?**

A) – 1 B) 0 C) 1 D) 2 E) 5

13. $\frac{x}{3} + y = 8$

$\frac{y}{3} + x = 4$

$\Rightarrow$ **(x + y) = ?**

A) 4 B) 9 C) 12 D) 24 E) 36

14. $\frac{2}{a} + b = 5$

$\frac{2}{b} + a = 15$

$\Rightarrow$ $\frac{a}{b}$ **= ?**

A) $\frac{1}{3}$ B) 3 C) 5 D) 15 E) 20

15. $x + 4y - 5z = 13$

$7x + 4y + 13z = 35$

$\Rightarrow$ **x + y + z = ?**

A) 5 B) 6 C) 8 D) 11 E) 16

16. $a, b \in Z^+$

$a^2 - b^2 = 29$

$\Rightarrow$ **(a + b) = ?**

A) 14 B) 15 C) 19 D) 29 E) 30

1-D 2-A 3-B 4-E 5-B 6-C 7-A 8-D 9-E 10-A 11-C 12-A 13-B 14-B 15-B 16-D

1.

$x + y - z = 4$

$2x + y + z = 4$

$x - 3y + 2z = 15$

$\Rightarrow$ **y = ?**

A) 5 B) 3 C) 1 D) – 3 E) – 5

2. $x, y \in N,\ x - y \neq 0$

$\frac{13}{x - y} = x + y$

$\Rightarrow$ **(x . y) = ?**

A) 56 B) 42 C) 28 D) 19 E) 18

3.

$x + 2y + 3z = 5$

$2x - 3y - 8z = 3$

$\Rightarrow$ **x + y + z = ?**

A) 3 B) 4 C) 6 D) 7 E) 8

4.

$a + b = 4$

$a . c = 4$

$b . c = 12$

$\Rightarrow$ **c = ?**

A) 1 B) 2 C) 4 D) 8 E) 16

5.

$m + n = 7$

$-n - p = 4$

$p + m = 3$

$\Rightarrow$ **(m . n . p) = ?**

A) – 4 B) – 3 C) 0 D) 3 E) 7

6. $\frac{x - y}{x + y} = 3$

$\Rightarrow$ $\frac{-x - 3y}{x + y}$ **= ?**

A) – 5 B) – 4 C) – 3 D) 2 E) 1

7. $b \in Z^+$

$\frac{a - b}{b} = 4$

$\frac{-b - c}{b} = 8$

$b(a + c) = -36$

$\Rightarrow$ **b = ?**

A) 12 B) 10 C) 9 D) 3 E) 1

8. $x, y, z \in R$

$\frac{1}{x . y} = \frac{4}{3}$

$\frac{2}{y . z} = \frac{3}{7}$

$\frac{4}{x . z} = \frac{1}{14}$

$\Rightarrow$ **x = ?**

A) 3 B) 4 C) 7 D) 14 E) 48

9. $\frac{x+y}{x.y} = 5$

$\frac{x+z}{x.z} = 4$

$\frac{y+z}{y.z} = 7$

$\Rightarrow$ **y = ?**

A) 4 B) 3 C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{8}$

10. $x + 2y = 3xy$

$y + 3x = 4xy$

$\Rightarrow$ **y = ?**

A) – 1 B) 0 C) 1 D) 2 E) $\frac{5}{2}$

11. $ax + by = 2$

$2bx - 3ay = 9$

$(a, b) = (1, 1)$

$\Rightarrow$ **y = ?**

A) 3 B) 2 C) 1 D) 0 E) – 1

12. $a + b = 4$

$b + c = 5$

$c + a = 3$

$\Rightarrow$ **a . b . c = ?**

A) 1 B) 2 C) 3 D) 6 E) 8

13. $x \in Z^-$

$x . y = 56$

$y . z = -42$

$x . z = -48$

$\Rightarrow$ **y = ?**

A) 8 B) 7 C) 6 D) – 6 E) – 7

14. $z > y > x$

$x . y = 18$

$y . z = -21$

$x . z = -42$

$\Rightarrow$ **2x – 3y + z = ?**

A) 7 B) 4 C) – 3 D) – 6 E) – 16

15. $x + 2y - z = 11$

$2x - y + 3z = -13$

$\Rightarrow$ **x + y = ?**

A) – 2 B) 2 C) 4 D) 7 E) 8

16. $3a + b + 3c = 18$

$4b + 2(a + c) = 2$

$\Rightarrow$ **(a + c) . b = ?**

A) – 20 B) – 21 C) – 22 D) – 23 E) – 24

1-E 2-B 3-B 4-C 5-C 6-E 7-D 8-A 9-D 10-C 11-E 12-D 13-E 14-B 15-C 16-B

1. $a + 3 = b$

$b - 1 = c$

$c + a = 3d$

$a + b + c = 11$

$\Rightarrow$ **d = ?**

A) 2 B) 4 C) 6 D) 9 E) 11

2. $\frac{2x+1}{8} - \frac{x}{6} + \frac{x-7}{5} + \frac{20-2x}{16} = \frac{x}{30}$

$\Rightarrow$ **x = ?**

A) 30 B) 15 C) 5 D) $\frac{1}{5}$ E) $\frac{1}{6}$

3. $a \in Z^+$

$a \,.\, m = 13$

$a \,.\, n = 12$

$a \,.\, p = 20$

$\Rightarrow$ **a + m + n − p = ?**

A) 26 B) 25 C) 13 D) 12 E) 6

4. $a \,.\, b \,.\, c = 4$

$b \,.\, c \,.\, d = 3$

$a - d = \frac{1}{7}$

$\Rightarrow$ **a = ?**

A) $\frac{3}{7}$ B) $\frac{4}{7}$ C) $\frac{5}{7}$ D) $\frac{6}{7}$ E) 1

5. $a \neq b$

$a \,.\, m - a^2 = b \,.\, m - b^2$

$\Rightarrow$ **m = ?**

A) a B) b C) a + b D) a − b E) a . b

6. $a^2 - 2a = a^3 + a^2 - 6a$

$\Rightarrow$ **S.S. = ?**

A) $\{-2\}$ B) $\{-2, 0, 2\}$ C) $\{-3, 0, 2\}$ D) $R - \{0, 2\}$ E) $R - \{-3, 0, 2\}$

7. $2x - 3y - 4z = 0$

$\Rightarrow \frac{(2x-4z).(3y+4z).(2x-3y)}{x \,.\, y \,.\, z} = ?$

A) 4 B) 6 C) 12 D) 24 E) 36

8. $3x - 2y - z = 0$

$\Rightarrow \frac{x-z}{x-y} = ?$

A) − 2 B) − 1 C) $\frac{1}{2}$ D) 2 E) $\frac{5}{2}$

9. $12x - y = 12z$

$\Rightarrow \dfrac{y}{x-z} \cdot \dfrac{12z + y}{12x} = ?$

A) $\dfrac{1}{144}$ B) $\dfrac{1}{12}$ C) 1 D) 12 E) 144

10. $\dfrac{3}{x} = \dfrac{4}{y}$

$\dfrac{2x}{y} + \dfrac{5y}{x} - 3 = z$

$\Rightarrow z = ?$

A) $\dfrac{31}{6}$ B) $\dfrac{33}{6}$ C) $\dfrac{49}{6}$ D) $\dfrac{51}{6}$ E) $\dfrac{53}{6}$

11. $(x - y + 3)^2 + (2x - y + 5)^2 = 0$

$\Rightarrow (x \,.\, y) = ?$

A) -3 B) -2 C) -1 D) 1 E) 2

12. $a \neq 0$

$\dfrac{m(a-n)}{4} + \dfrac{n(m-a)}{5} = -\dfrac{mn}{20}$

$\Rightarrow \dfrac{m}{n} = ?$

A) $\dfrac{5}{4}$ B) $\dfrac{4}{5}$ C) $\dfrac{3}{5}$ D) $-\dfrac{4}{5}$ E) $-\dfrac{5}{4}$

13. $\dfrac{1}{x+2} + \dfrac{2}{x+1} + \dfrac{3}{x+a} = 4$

ÇK (S.S.) = $\{2\}$

$\Rightarrow a = ?$

A) -1 B) $-\dfrac{37}{38}$ C) $-\dfrac{38}{37}$ D) $-\dfrac{39}{37}$ E) -2

14. $a, b \in R^+$,

$a^2 - b^2 = 18$

$a + b = 9$

$\Rightarrow b = ?$

A) $\dfrac{11}{2}$ B) $\dfrac{7}{2}$ C) 3 D) $\dfrac{5}{2}$ E) $\dfrac{3}{2}$

15. $\dfrac{x}{3} + \dfrac{y}{4} = 2$

$2x - 3y = 6$

$\Rightarrow x = ?$

A) 3 B) 4 C) 5 D) 6 E) 8

16. $x + y = 4$

$3x + 3y = 12$

$\Rightarrow$ ÇK(S.S.) = ?

A) $R - \{1, 3\}$ B) $\{1, 3\}$ C) $\{-1, 5\}$ D) $\varnothing$ E) R

1-A 2-D 3-E 4-B 5-C 6-B 7-D 8-A 9-D 10-A 11-B 12-B 13-C 14-B 15-C 16-E

1. $$\frac{3a}{b+\frac{2}{a}}+\frac{4b}{a+\frac{2}{b}}=\frac{7b^2}{ab+2}$$

$\Rightarrow \frac{a}{b}=?$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

2. $(7-3x).(x-3)+(-x+4).(3x-7)=0$

$\Rightarrow \sum x=?$

A) 6 B) $\frac{35}{6}$ C) $\frac{31}{6}$ D) $\frac{6}{31}$ E) $\frac{6}{35}$

3. $x+y-3z=1$

$x-2y-4z=5$

$x+y=7$

$\Rightarrow z=?$

A) -2 B) 1 C) 2 D) 3 E) 9

4. $x, y, a, b \in R^+$

$\frac{a}{x}.\frac{b}{y}=3$

$\frac{a^2}{x^2}+\frac{y^2}{b^2}=160$

$\Rightarrow y=?$

A) 4 B) $-4a$ C) $-4b$ D) $4b$ E) $4a$

5. $4ax-a^3=18$

$4x-a^2=6$

$\Rightarrow a \in R^+=?$

A) 9 B) 3 C) 2 D) $\frac{1}{3}$ E) $\frac{1}{2}$

6. $(x+2).(x-2).(x+3)=(x-3).(x+3).(x+2)$

$\Rightarrow$ ÇK(S.S.) = ?

A) $\{-2, 2\}$ B) $\{-3, -2, 2\}$ C) $\{-2, 2\}$ D) $\{-3, -2\}$ E) $(-3, -2)$

7. $ax(x-2)+bx(x+2)+c(x^2-4)=2x-10$

$\Rightarrow a.b.c=?$

A) $\frac{111}{32}$ B) $\frac{107}{32}$ C) $\frac{105}{32}$ D) $\frac{32}{105}$ E) $-\frac{105}{32}$

8. $x, y \in Z^+$

$xy-y-x-2=0$

$\Rightarrow y_{max}=?$

A) 4 B) 3 C) 2 D) 1 E) $\frac{1}{2}$

9. $\dfrac{0{,}003x + 0{,}007}{0{,}007x + 0{,}003} = \dfrac{4}{5}$

$\Rightarrow$ **x = ?**

A) $\dfrac{28}{13}$ B) $\dfrac{27}{13}$ C) 2 D) $\dfrac{25}{13}$ E) $\dfrac{23}{13}$

10. $a + b + c = 8$

$ab + ac = 16$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 4 D) 8 E) 9

11. $a, b, c \in Z^+$

$a + 3b + 7c = 105$

$\Rightarrow$ $\mathbf{b_{max} = ?}$

A) 31 B) 32 C) 33 D) 45 E) 46

12. $x + y + z = p$

$y - z + p = x$

$z + p + x = y$

$\Rightarrow$ **p + x + y = ?**

A) 3z B) 2z C) z D) – z E) – 2z

13. $\dfrac{x}{a} = \dfrac{x(y + z)}{ya} + z$

$\Rightarrow$ **a = ?**

A) $-\dfrac{x}{y}$ B) $\dfrac{x}{y}$ C) $-\dfrac{y}{x}$ D) $\dfrac{zx}{y}$ E) $\dfrac{y}{xz}$

14. $\dfrac{2 - a}{a} + \dfrac{a}{a + 3} = \dfrac{2}{a} + \dfrac{4}{5}$

$\Rightarrow$ **4a = ?**

A) – 27 B) – 20 C) 12 D) 20 E) 27

15. $a, b, c \in Z^+$

$a + b - c = 3$

$2a + b - c = 4$

$\Rightarrow$ **a = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

16. $a + b + c = 11$

$a^2 + b^2 + c^2 = 21$

$\Rightarrow$ **ab + ac + bc = ?**

A) 11 B) 23 C) 49 D) 50 E) 71

1-A 2-B 3-C 4-D 5-B 6-D 7-C 8-A 9-E 10-C 11-B 12-D 13-A 14-A 15-E 16-D

ÜNİTE 4

Unit 4

Üslü İfadeler / Exponential Expressions

1. $4^3 + 3^3 + 2^3 + 1^3 = ?$

A) 102 B) 100 C) 97 D) 93 E) 80

2. $(-2)^3 + (-3)^3 + (-4)^2 = ?$

A) 19 B) 16 C) – 16 D) – 19 E) – 21

3. $2^3 . 2^4 . 2^5 . 2^7 = ?$

A) 184 B) 256 C) 2^{19} D) 2^{20} E) 2^{420}

4. $4^x . 4^9 . 4^5 = 2^{30}$

$\Rightarrow$ x = ?

A) 1 B) 2 C) 3 D) 4 E) 5

5. $6^2 . 6^{-3} . 6^7 = 36^x$

$\Rightarrow$ x = ?

A) 6 B) 5 C) 4 D) 3 E) – 3

6. $(-3)^4 . (-3^4) . (-3^8) = ?$

A) 3^{16} B) -3^{16} C) 3^0 D) -3^8 E) 3^8

7. $\dfrac{[7 + 4^{1983}]^0 + 3^2}{5} = ?$

A) 10 B) 5 C) 3 D) $\dfrac{5}{2}$ E) 2

8. $(-1)^{1963} + (-1)^{-1974} - (-1)^{2000} + (-1^{2003}) = ?$

A) – 4 B) – 2 C) 0 D) 2 E) 4

9. $6^{-1} \cdot [(2013)^0 + 5^{-1}]^{-1} = ?$

A) 36 B) 6 C) 1 D) $\frac{1}{6}$ E) $\frac{5}{36}$

10. $[(-3)^4 \cdot (-3^4) \cdot (-3^5)]^{-1} = ?$

A) 6^{-15} B) 2^{-13} C) 3^{-13} D) 3^{12} E) -3^{13}

11. $\dfrac{[7^1 + 7^{-1}]^{-1} \cdot 5^3}{2^{-1}} = ?$

A) $\frac{1}{7}$ B) 5 C) 7 D) 35 E) 70

12. $\left(1 - \frac{1}{4}\right)^{-3} \cdot \left(1 + \frac{1}{4}\right)^{3} \cdot \left(3 - \frac{1}{2}\right)^{-3} \cdot \left(1 + \frac{1}{2}\right)^{4} = ?$

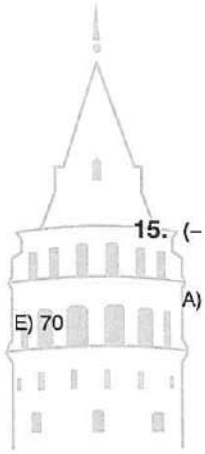
A) 12 B) 6 C) $\frac{3}{2}$ D) $\frac{2}{3}$ E) $\frac{1}{12}$

13. $\dfrac{16^3}{(-2^2)^5} = ?$

A) -16 B) -4 C) $\frac{1}{4}$ D) 8 E) 16

14. $\dfrac{(5^{-4})^{-5} \cdot (-5^{-2}) \cdot (-5^{-11})^{-1}}{5^2 \cdot (-5)^3 \cdot (-5^4)^5} = ?$

A) 5^6 B) 5^{-5} C) 5^4 D) -5^4 E) -5^{-4}



15. $(-a)^2 \cdot (-a^3)^{-1} \cdot (-a^{-2}) \cdot (-a^{-3})^{-2} = ?$

A) $-a^2$ B) $-a^{-2}$ C) a^3 D) $-a^{-3}$ E) $-a^3$

16. $\dfrac{a + a + a + a + a + a}{a^6} = ?$

A) 6 B) a C) a^5 D) $6a^5$ E) $6a^{-5}$

1-B 2-D 3-C 4-A 5-D 6-A 7-E 8-B 9-E 10-C 11-D 12-C 13-B 14-C 15-C 16-E

1. $\dfrac{10^{11}}{10^{12}} = 10^x$

$\Rightarrow$ x = ?

A) – 2 B) – 1 C) 0 D) 1 E) 2

2. $\dfrac{5^4 \cdot 25^4 \cdot 125^4}{5^{-6}} = ?$

A) 5^{-24} B) 5^{28} C) 5^{30} D) 5^{-30} E) 5^{-28}

3. $\dfrac{4^2 \cdot 2^4 \cdot 8^4 \cdot 4^8}{2^{20} \cdot 2^{-2}} = ?$

A) 2^{16} B) 2^{18} C) 2^{20} D) 2^{21} E) 2^{23}

4. $\dfrac{2^5 \cdot 2^6 \cdot 3^7 \cdot 3^{-4}}{2^{11}} = a$

$\Rightarrow$ a = ?

A) 3^{-3} B) 3^3 C) 3^{-2} D) 1 E) 3

5. $(-5^2)^4 = ?$

A) -5^8 B) -5^6 C) 25^4 D) 25^5 E) 5^{26}

6. $\dfrac{(32)^5}{(16)^4} = 2^x$

$\Rightarrow$ x = ?

A) 2^{19} B) 512 C) 32 D) 16 E) 9

7. $(3^{12})^{\frac{1}{4}} = ?$

A) 3^4 B) 3^3 C) 3^2 D) 3^1 E) 3^{-1}

8. $\left[((5^{-4})^{-5})^3\right]^{\frac{1}{30}} = ?$

A) -5^2 B) -5^{-2} C) 5 D) 5^2 E) 5^3

9. $\left(\frac{2}{7}\right)^4 . \left(\frac{7}{2}\right)^{-4} = ?$

A) $\left(\frac{2}{7}\right)^4$ B) 1 C) $\left(\frac{2}{7}\right)^8$ D) $\left(\frac{2}{7}\right)^{-4}$ E) $\left(\frac{2}{7}\right)^{-8}$

10. $\left(\frac{1}{2}\right)^{-3} . 2^{-4} . \left(\frac{1}{4}\right)^{-3} = ?$

A) 2^9 B) 2^5 C) -2^{-5} D) -2^5 E) -2^7

11. $a^{-1} . \left(\frac{1}{a}\right)^{-3} . \left(\frac{1}{a}\right)^{7} . a^7 = a^x$

$\Rightarrow x = ?$

A) a^2 B) a^1 C) a^{-2} D) 1 E) 2

12. $\left(\frac{4}{3}\right)^{-1} + \frac{4^{-1}}{3} = ?$

A) $\frac{8}{3}$ B) $\frac{3}{8}$ C) $\frac{5}{6}$ D) $\frac{12}{13}$ E) $\frac{1}{12}$

13. $(-9^4) . (-3^{-8}) + (-3)^2 = ?$

A) 3^{16} B) 10 C) 9 D) 3^{-6} E) 3^{-16}

14. $(-3^3)^2 + \frac{9^3}{2^{-1}} = ?$

A) 3^9 B) 3^8 C) 3^7 D) 3^5 E) 3^3

15. $12 . 7^{-2} + \left(\frac{49}{37}\right)^{-1} = ?$

A) $\frac{98}{37}$ B) $\frac{90}{37}$ C) $\frac{49}{37}$ D) $\frac{40}{37}$ E) 1

16. $\left(\frac{a}{b}\right)^{-1} . \frac{b^2}{a^3} . \frac{1}{a^{-4}} . a^{-1} = ?$

A) ba^3 B) ba^{-3} C) $b^{-3}a^{-1}$ D) b^3a^{-1} E) b^3a

1-B 2-C 3-B 4-B 5-C 6-E 7-B 8-D 9-C 10-B 11-E 12-C 13-B 14-C 15-E 16-D

1. $2^{2x+3} = 32$

$\Rightarrow$ x = ?

A) 3 B) 2 C) 1 D) – 1 E) $-\frac{1}{3}$

2. $\left[(2^4)^3\right]^2 = 2^{10x-10}$

$\Rightarrow$ x = ?

A) 2 B) 3 C) $\frac{17}{5}$ D) $\frac{19}{5}$ E) $\frac{34}{5}$

3. $625 = 5^{3x-8}$

$\Rightarrow$ x^2 = ?

A) 4 B) 5 C) 8 D) 16 E) 25

4. $6^{x-1} = 36^{2x-3}$

$\Rightarrow$ x = ?

A) $-\frac{5}{3}$ B) $-\frac{3}{5}$ C) 0 D) $\frac{3}{5}$ E) $\frac{5}{3}$

5. $4^{18x} = 8^{12x+x^2-1}$

$\Rightarrow$ min(x) = ?

A) 3 B) 2 C) 1 D) – 1 E) – 2

6. $8^{\frac{2}{3}} \cdot 36^{\frac{1}{2}} \cdot 125^{\frac{1}{3}} = ?$

A) 120 B) 240 C) 360 D) 600 E) 720

7. $a^x \cdot a^{2x} \cdot a^{3x} \cdot a^{4x} = a^{11x-7}$

$\Rightarrow$ a^x = ?

A) 7 B) a^7 C) – 7 D) a^{-7} E) $-a^{-7}$

8. $\left(\frac{2}{3}\right)^{x-7} = \left(\frac{9}{4}\right)^{x-4}$

$\Rightarrow$ x = ?

A) 9 B) 8 C) 7 D) 6 E) 5

9. $2^5 . 3^5 . 4^5 = a$

$\Rightarrow$ **a = ?**

A) 5^{24} B) 24^5 C) 12^5 D) 8^5 E) 5^5

10. $3^x . 4^x = 12^{2x+2}$

$\Rightarrow$ **x = ?**

A) 1 B) 0 C) – 1 D) – 2 E) – 3

11. $8^x . 27^x = 6^{x+4}$

$\Rightarrow$ **x = ?**

A) 6 B) 4 C) 2 D) 1 E) 0

12. $\frac{10^7}{5^7} = a^{14}$

$\Rightarrow$ **a^2 = ?**

A) 2 B) 5 C) 7 D) 10 E) 13

13. $\frac{26^5 . 2^{-5}}{13^5} = ?$

A) 169 B) 26 C) 13 D) 1 E) $\frac{1}{13}$

14. $\frac{8}{3^3} = \left(\frac{3}{2}\right)^{-x}$

$\Rightarrow$ **x = ?**

A) 9 B) 7 C) 5 D) 3 E) 1

15. $\frac{4}{5^x} = \left(\frac{5}{2}\right)^{-x}$

$\Rightarrow$ **x = ?**

A) 20 B) 11 C) 9 D) 3 E) 2

16. $(16 . 5^{-1})^x = \frac{4}{5^x}$

$\Rightarrow$ **x = ?**

A) $\frac{1}{2}$ B) 1 C) 2 D) 3 E) 4

1-C 2-C 3-D 4-E 5-D 6-A 7-B 8-E 9-B 10-D 11-C 12-A 13-D 14-D 15-E 16-A

1. $6 . 7^x + 7^x = 49$

$\Rightarrow$ $x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

2. $4 . 2^x + 5 . 2^x + 9 . 2^x = 36$

$\Rightarrow$ $x = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

3. $5 . 6^x + 7 . 6^x - 6^x = 6^{-1}$

$\Rightarrow$ $6^x = ?$

A) $\frac{1}{66}$ B) $\frac{1}{6}$ C) 1 D) 6 E) 36

4. $8 . 9^3 + 7 . 27^2 + 12 . 3^6 = a$

$\Rightarrow$ $a = ?$

A) 3^6 B) 3^7 C) 3^8 D) 3^9 E) 3^{10}

5. $5^{x+3} + 7 . 5^x - 12 . 5^x = 3000$

$\Rightarrow$ $x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $4^{x+2} + 4^{x+1} + 4^{x+3} = 21$

$\Rightarrow$ $4^x = ?$

A) $\frac{1}{16}$ B) $\frac{1}{8}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

7. $\frac{a^{x+2} - a^{x+3}}{-a^3 + a^4} = ?$

A) a^{-x-1} B) a^{x+1} C) a^{x-1} D) $-a^{x-1}$ E) $-a^x$

8. $\frac{a^3 . a^3 . a^3}{a^3 + a^3 + a^3} = ?$

A) $3a^{-6}$ B) $3a^6$ C) a^6 D) a^3 E) $\frac{a^6}{3}$

9. $\dfrac{3^{x+5}+3^{x+6}-3^{x+7}}{3^7-3^6-3^5}=-9$

$\Rightarrow$ x = ?

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

10. $\dfrac{4^{20}+4^{22}+4^{24}}{4^{18}+4^{20}+4^{22}}=?$

A) 32 B) 16 C) 8 D) 4 E) 2

11. $\dfrac{7^{100}+7^{101}+7^{102}}{7^{103}+7^{104}+7^{105}}=?$

A) 7^{-3} B) 7^{-2} C) 7^{-1} D) 7^{2} E) 7^{3}

12. $\dfrac{(-3)^{2n+3}+(-3)^{2n+2}+(-3)^{2n+1}}{3^{2n-1}+3^{2n}}=?$

A) $\frac{63}{4}$ B) $\frac{4}{63}$ C) $-\frac{4}{63}$ D) $-\frac{63}{4}$ E) $-\frac{65}{4}$

13. $\left(-\frac{7}{8}\right)^{-1}+\left(3\frac{2}{5}\right)^{-1}+\left(1\frac{8}{7}\right)-\left(1\frac{5}{17}\right)=?$

A) $\frac{15}{17}$ B) $\frac{5}{17}$ C) $\frac{3}{17}$ D) $\frac{1}{17}$ E) 0

14. $((-4)^2)^3\cdot(-4^2)^2\cdot(-4^3)^2\cdot(-4^{-2})^3=?$

A) -2^{24} B) -2^{22} C) -2^{20} D) 2^{20} E) 2^{48}

15. $\left(\frac{1}{16}\right)^{\frac{1}{4}}+\left(\frac{1}{9}\right)^{-\frac{1}{2}}+\left(-\frac{1}{125}\right)^{-\frac{2}{3}}-\left(\frac{1}{8}\right)^{\frac{1}{3}}=?$

A) $29\frac{1}{2}$ B) 29 C) 28 D) 27 E) 26

16. $\dfrac{\left(-\frac{1}{2}\right)^{-1}+\left(-\frac{1}{2}\right)^{-2}+\left(-\frac{1}{2}\right)^{-3}+\left(-\frac{1}{2}\right)^{-4}}{2^{-1}-2^{-2}+2^{-3}-2^{-4}}=?$

A) 32 B) 34 C) 36 D) 48 E) 54

1-B 2-E 3-A 4-D 5-B 6-C 7-D 8-E 9-D 10-B 11-A 12-D 13-E 14-C 15-C 16-A

1. $(x-3)^{11} = (-x+11)^{11}$

$\Rightarrow$ **x = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

2. $(x+3)^5 = (2x-7)^5$

$\Rightarrow$ **x = ?**

A) 5 B) 6 C) 7 D) 8 E) 10

3. $(x-2)^4 = (2x-10)^4$

$\Rightarrow$ **S.S. = ?**

A) $\{4, 8\}$ B) $\{4, 6\}$ C) $\{6, 8\}$ D) $\{-4, 6\}$ E) $\{-6, 8\}$

4. $(3x-4)^2 = (x-1)^2$

$\Rightarrow$ **S.S. = ?**

A) $\left\{\frac{1}{2}, \frac{3}{2}\right\}$ B) $\left\{\frac{5}{4}, \frac{3}{2}\right\}$ C) $\left\{\frac{5}{4}, \frac{7}{4}\right\}$ D) $\left\{\frac{1}{2}, \frac{5}{4}\right\}$ E) $\left\{\frac{7}{4}, \frac{3}{2}\right\}$

5. $x^2 - 4x + 4 = (2x-7)^2$

$\Rightarrow$ **S.S. = ?**

A) $\{5, 10\}$ B) $\{1, 3\}$ C) $\{3, 5\}$ D) $\{3\}$ E) $\{5\}$

6. $25x^2 = (3x-11)^2$

$\Rightarrow$ x_{max} **= ?**

A) $\frac{13}{8}$ B) $\frac{11}{8}$ C) $\frac{4}{3}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

7. $6^{x+3} = 1$

$\Rightarrow$ **x = ?**

A) 0 B) -1 C) -2 D) -3 E) -4

8. $15^{3x-7} = 1$

$\Rightarrow$ **3x = ?**

A) 15 B) 12 C) 9 D) 8 E) 7

9. $(x-5)^4 = 1$

$\Rightarrow$ **S.S. = ?**

A) $\{-4, 6\}$ B) $\{-3, 4\}$ C) $\{4, 6\}$ D) $\{-5, 3\}$ E) $\{-5, 5\}$

10. $(2x-13)^{10} = 1$

$\Rightarrow$ $\Sigma x = ?$

A) 13 B) 11 C) 10 D) 9 E) 7

11. $(13x-25)^7 = 1$

$\Rightarrow$ **x = ?**

A) $\frac{25}{3}$ B) 5 C) $\frac{17}{4}$ D) $\frac{8}{3}$ E) 2

12. $(4x-5)^{-20} = 1$

$\Rightarrow$ **S.S. = ?**

A) $\left\{1, \frac{3}{2}\right\}$ B) $\left\{\frac{2}{3}, 1\right\}$ C) $\left\{\frac{2}{3}, \frac{3}{2}\right\}$ D) $\left\{\frac{5}{4}, \frac{3}{2}\right\}$ E) $\left\{1, \frac{5}{4}\right\}$

13. $(x-1)^{x+2} = 1$

$\Rightarrow$ **S.S. = ?**

A) $\{-2, 0\}$ B) $\{-2, 0, 2\}$ C) $\{-1, 0\}$ D) $\{-1, 0, 1\}$ E) $\{-2, 0, 1\}$

14. $(x^2-1)^{x-2} = 1$

$\Rightarrow$ **S.S. = ?**

A) $\{-\sqrt{2}, 0, \sqrt{2}\}$ B) $\{-1, 0, 1\}$ C) $\{0, \sqrt{2}\}$ D) $\{1, -1\}$ E) $\{-\sqrt{2}, 0, \sqrt{2}, 2\}$

15. $(x^2-3)^{x+5} = 1$

$\Rightarrow$ **S.S. = ?**

A) $\{-5, -2\}$ B) $\{-2, 2\}$ C) $\{3, 5\}$ D) $\{-5, 3, 4\}$ E) $\{-5, -2, 2\}$

16. $(x+2)^{2x} + (-x-2)^{2x} = 2$

$\Rightarrow$ $\Sigma x = ?$

A) -3 B) -4 C) -5 D) -6 E) -8

1-D 2-E 3-A 4-B 5-C 6-B 7-D 8-E 9-C 10-A 11-E 12-A 13-B 14-E 15-E 16-B

1. $2^a = 3^3$

$2^b = 3^7$

$\Rightarrow \frac{a}{b} = ?$

A) $\frac{7}{3}$ B) $\frac{3}{7}$ C) $\frac{2}{7}$ D) $\frac{7}{2}$ E) $\frac{1}{2}$

2. $7^x = 14^2$

$2^y = 49$

$\Rightarrow y = ?$

A) $\frac{4}{x-2}$ B) $\frac{x-2}{4}$ C) $\frac{2}{2x-2}$ D) $2x-2$ E) $\frac{1}{x-2}$

3. $27^x = 8$

$16^y = 3$

$\Rightarrow x = ?$

A) $4y$ B) $2y$ C) y D) $\frac{1}{2y}$ E) $\frac{1}{4y}$

4. $16^x = 12$

$36 = 2^y$

$\Rightarrow y + 2 = ?$

A) $-4x$ B) $-2x$ C) x D) $4x$ E) $8x$

5. $x = 5^3$

$y = 5^7$

$z = 5^{-2}$

$\Rightarrow ? > ? > ?$

A) $z > y > x$ B) $y > z > x$ C) $y > x > z$ D) $z > x > y$ E) $x > y > z$

6. $a = \frac{1}{5}$

$b = \left(\frac{1}{5}\right)^2$

$c = \left(\frac{1}{25}\right)^3$

$\Rightarrow ? > ? > ?$

A) $b > c > a$ B) $b > a > c$ C) $c > a > b$ D) $a > c > b$ E) $a > b > c$

7. $a = (-3^4)^5$

$b = (-3^5)^4$

$c = (-3^4)^{-5}$

$\Rightarrow ? > ? > ?$

A) $a > b > c$ B) $c > a > b$ C) $c > b > a$ D) $b > c > a$ E) $b > a > c$

8. $a = 4^{45}$

$b = 3^{60}$

$c = 2^{75}$

$\Rightarrow$ **? > ? > ?**

A) b > a > c B) b > c > a C) a > b > c

D) a > c > b E) c > a > b

9. $x = (-3)^4$

$y = (-3)^5$

$z = (-3)^{-4}$

$\Rightarrow$ **? > ? > ?**

A) y > z > x B) y > x > z C) y > x > z

D) x > y > z E) x > z > y

10. $x = \left(\frac{1}{8}\right)^{-7}$

$y = \left(-\frac{1}{8}\right)^{-9}$

$z = \left(-\frac{1}{8}\right)^{-11}$

$\Rightarrow$ **? > ? > ?**

A) x > z > y B) x > y > z C) y > z > x

D) y > x > z E) z > x > y

11. $4^x = 264$

$3^y = 251$

$2^z = 198$

$\Rightarrow$ **? > ? > ?**

A) y > x > z B) y > z > x C) z > y > x

D) z > x > y E) x > y > z

12. $12^{x+3} = 153$

$\Rightarrow$ **? > x > ?**

A) $-4 < x < -3$ B) $-3 < x < -2$

C) $-2 < x < -1$ D) $-1 < x < 0$

E) $0 < x < -1$

13. $x \in Z^+$

$2^{3x+4} < 2^{x+7}$

$\Rightarrow$ **max(x) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14. $x \in N$

$\left(\frac{3}{4}\right)^{x+1} < \left(\frac{3}{4}\right)^{-x+9}$

$\Rightarrow$ **min(x) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

1-B 2-A 3-E 4-E 5-C 6-E 7-D 8-A 9-E 10-B 11-C 12-D 13-A 14-D

1. $4^a = 27$

$3^b = 49$

$7^c = 8$

$\Rightarrow$ **a . b . c = ?**

A) $\frac{1}{12}$ B) $\frac{1}{9}$ C) 6 D) 9 E) 12

2. $a, b \in Z$

$3^{2a-b} = 5^{a+b-9}$

$\Rightarrow \frac{a}{b} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

3. $2^a = 3^b$

$\Rightarrow 4^{\frac{a}{b}} + 9^{\frac{b}{a}} + 8^{\frac{a}{b}} - 27^{\frac{b}{a}} = ?$

A) 40 B) 32 C) 27 D) 23 E) 19

4. $\frac{2}{1+4^x} + \frac{2}{1+4^{-x}} = ?$

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{1}{8}$

5. $3^x = a$

$5^x = b$

225^x in a ve b türünden değeri nedir?
(What is the value of 225^x in trems of a and b?)

A) a^2b^2 B) ab^2 C) a^2b D) ab E) a^3b^2

6. $a, b \in R$

$\frac{8^{a+b}}{3^{a-b}} = 144$

$\Rightarrow$ **a . b = ?**

A) -3 B) $-\frac{5}{9}$ C) $-\frac{2}{9}$ D) $\frac{2}{9}$ E) 2

7. $7^a = 2^b$

$\Rightarrow 7^{\frac{5a}{b}} - 2^{\frac{2b}{a}} = ?$

A) 17 B) 15 C) 13 D) -15 E) -17

8. $3^{y+2} - 3^{y+1} = 54$

$5^{2x+1} + 5^{2x} = 150$

$\Rightarrow 2^{x+y} = ?$

A) 128 B) 64 C) 32 D) 16 E) 8

9. $15^{a+2} = x \,.\, 75^{a-2}$

$5^a = 81$

$\Rightarrow$ **x = ?**

A) 5^2 B) 5^3 C) 5^4 D) 5^5 E) 5^6

10. $\dfrac{(2^a+1)(2^a-1)(2^{2a}+1)(2^{4a}+1)}{2^{16a}-1} = \dfrac{1}{2^{32}+1}$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 4 D) 8 E) 12

11. $\dfrac{(3^4-1)(3^4+1)}{3^9-3} = ?$

A) $\dfrac{1}{9}$ B) $\dfrac{1}{3}$ C) 3 D) 9 E) 27

12. $\dfrac{5^{3n+1}+125^{n+1}}{65 \,.\, 5^{3n}} + \dfrac{3^{6n+4}+9^{3n+1}}{45 \,.\, 27^{2n}} = ?$

A) 30 B) 40 C) 34 D) 14 E) 4

13. $\dfrac{7^{1999}+7^{2000}+7^{2001}}{7^{-1998}+7^{-1999}+7^{-2000}} = ?$

A) 7^{3999} B) 7^{1999} C) 7 D) 7^{-1999} E) 7^{-3999}

14. $\dfrac{2^{4x}+2^{3x}}{2^{2x}} - \dfrac{2^{5x}+2^{2x}}{2^{3x}} = 7 \,.\, 2^{-x}$

$\Rightarrow$ **x = ?**

A) $\dfrac{1}{2}$ B) 1 C) $\dfrac{3}{2}$ D) $\dfrac{5}{2}$ E) 3

15. $7^x \,.\, 2^y = 56^x$

$\Rightarrow \dfrac{x+y}{x-y} = ?$

A) -3 B) -2 C) 2 D) 5 E) 7

16. $\left(\dfrac{1}{216}\right)^{3+x} = 36^{x-7}$

$\Rightarrow$ **x = ?**

A) 23 B) 17 C) 7 D) 1 E) $\dfrac{1}{7}$

1-D 2-C 3-B 4-A 5-A 6-B 7-E 8-E 9-E 10-C 11-B 12-E 13-A 14-C 15-B 16-D

1. $-2 \cdot 5^{-x-1} + \dfrac{7}{5^{x+1}} = 125$

$\Rightarrow$ $3^x = ?$

A) 27 B) 9 C) 3 D) $\dfrac{1}{3}$ E) $\dfrac{1}{27}$

2. $\dfrac{3}{1+\dfrac{m}{n}} + \dfrac{3}{1+\dfrac{n}{m}} = ?$

A) $\dfrac{m}{n}$ B) $\dfrac{n}{m}$ C) $m+n$ D) 1 E) 3

3. $m^{n+2} = 4$

$m^3 \cdot 2^3 = 2^{n+1}$

$\Rightarrow$ $n^2 = ?$

A) 3 B) 6 C) 9 D) 10 E) 12

4. $2^x \cdot 3^y \cdot 5^z = 13$

$14^x \cdot 21^y \cdot 35^z = 91$

$\Rightarrow$ $x + y + z = ?$

A) -1 B) 0 C) 1 D) 2 E) 7

5. $14^{3x+4} = 190$

$\Rightarrow$ $? < x < ?$

A) $-1 < x < \dfrac{2}{3}$ B) $-1 < x < -\dfrac{2}{3}$

C) $-1 < x < 0$ D) $-\dfrac{2}{3} < x < 1$

E) $-\dfrac{3}{2} < x < -\dfrac{2}{3}$

6. $\dfrac{m}{a^{x+y}+1} + \dfrac{m}{a^{-x-y}+1} = ?$

A) m B) a C) a^{x+y} D) 1 E) 0

7. $a^2 = a - 1$

$\Rightarrow$ $a^4 = ?$

A) $a-1$ B) $-a+1$ C) $-a$ D) a E) 1

8. $9^x - 9^y = 17$

$9^x + 9^y = 33$

$\Rightarrow$ $9^{x+y} = ?$

A) 200 B) 180 C) 160 D) 120 E) 50

9. $(\sqrt{11} - \sqrt{5})^x = 6$

$\Rightarrow (\sqrt{11} + \sqrt{5})^x = ?$

A) 6 B) 6^{x-1} C) 6^{x+1} D) 6^{2x} E) 16

10. $\dfrac{3^{2x}}{4^{3x}} = 6$

$\Rightarrow \left(\dfrac{1}{6}\right)^{\frac{1}{x}} = ?$

A) $\dfrac{9}{64}$ B) $\dfrac{4}{3}$ C) $\dfrac{16}{9}$ D) $\dfrac{48}{19}$ E) $\dfrac{64}{9}$

11. $14^b = 2$

$7^a = 5$

$\Rightarrow 14^{(1-b)a} = ?$

A) 2 B) 5 C) 7 D) 14 E) 21

12. $ab = b^{3a}$

$\dfrac{a}{b} = b^{2a-11}$

$\Rightarrow a = ?$

A) – 11 B) – 10 C) – 9 D) – 8 E) – 7

13. $x \neq y$

$3^{2x+y} - 3^{x+2y} - 3^{x+2} + 3^{y+2} = 0$

$\Rightarrow x + y = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

14. $7^x - 49 + 2^x \cdot 7^{x+1} = \dfrac{98}{14^{1-x}}$

$\Rightarrow x = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 2

15. $x = 3^a - 2$

$y = 4 + 9^a$

$\Rightarrow y = ?$

A) $x^2 + 4x + 8$ B) $x^2 + 4x$ C) $x^2 - 4x + 8$ D) $x^2 - 4x + 4$ E) $x^2 - 4x - 4$

16. $a = \dfrac{b}{5}$

$a^b = 3^{15}$

$\Rightarrow a \cdot b = ?$

A) 3 B) 5 C) 15 D) 21 E) 45

1-E 2-E 3-D 4-C 5-B 6-A 7-C 8-A 9-B 10-E 11-B 12-C 13-C 14-E 15-A 16-E

ÜNİTE 5

Unit 5

Köklü İfadeler / Radical Expressions

1. $\sqrt{4} + \sqrt{9} + \sqrt{16} - \sqrt{25} = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

2. $\sqrt{144} + \sqrt{225} - \sqrt{169} - \sqrt{196} = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 2

3. $\dfrac{\sqrt{100} + \sqrt{36}}{\sqrt{64}} = ?$

A) 1 B) 2 C) 4 D) 6 E) 8

4. $\sqrt{16} \cdot \sqrt{25} + \sqrt{225} \cdot \sqrt{4} + \sqrt{49} \cdot \sqrt{81} = ?$

A) 53 B) 73 C) 93 D) 113 E) 122

5. $\sqrt{169} \cdot \sqrt{9} - [\sqrt{100} - (\sqrt{25} - \sqrt{36})] = ?$

A) 50 B) 49 C) 29 D) 28 E) 19

6. $\sqrt{\dfrac{1}{16}} + \sqrt{\dfrac{1}{25}} - \sqrt{\dfrac{1}{9}} = ?$

A) $\dfrac{7}{60}$ B) $\dfrac{4}{30}$ C) $\dfrac{1}{5}$ D) $\dfrac{27}{60}$ E) $\dfrac{47}{60}$

7. $\dfrac{\sqrt{49}}{\sqrt{4}} + \dfrac{\sqrt{25}}{\sqrt{16}} + \dfrac{\sqrt{36}}{\sqrt{64}} = ?$

A) 4 B) $\dfrac{11}{2}$ C) $\dfrac{13}{2}$ D) $\dfrac{45}{8}$ E) $\dfrac{49}{8}$

8. $\dfrac{\sqrt{100}}{\sqrt{400}} + \sqrt{\dfrac{900}{225}} - \sqrt{\dfrac{1600}{2500}} = ?$

A) 3,8 B) 2,3 C) 2,1 D) 1,9 E) 1,7

9. $\sqrt[4]{16} + \sqrt[3]{27} + \sqrt{16} = ?$

A) 7 B) 8 C) 9 D) 10 E) 11

10. $\sqrt[3]{64} - \sqrt[3]{27} - \sqrt[3]{125} + \sqrt[3]{216} = ?$

A) 18 B) 12 C) 9 D) 3 E) 2

11. $\sqrt[3]{-1} + \sqrt[3]{(-2)^3} + \sqrt[3]{(-5)^3} = ?$

A) 8 B) 7 C) – 6 D) – 8 E) – 9

12. $\sqrt[5]{-32} + \sqrt[4]{(-2)^4} + \sqrt[3]{-8} + \sqrt{(-2)^2} = ?$

A) 8 B) 2 C) 0 D) – 2 E) – 8

13. $\sqrt[3]{29 - \sqrt[3]{8}} = ?$

A) $\sqrt{37}$ B) $\sqrt{21}$ C) 3 D) 2 E) 1

14. $\sqrt[4]{600 + \sqrt{625}} = ?$

A) 5 B) 15 C) 20 D) 25 E) 30

15. $\sqrt{33 + \sqrt{7 + \sqrt{4}}} = ?$

A) 3 B) 6 C) 12 D) 18 E) 36

16. $\sqrt[6]{8 \,.\, 5 + 4 \,.\, 5 + \sqrt[3]{64}}$

A) 2 B) 4 C) 8 D) 16 E) 32

1-A 2-C 3-B 4-D 5-D 6-A 7-B 8-E 9-C 10-E 11-D 12-C 13-C 14-A 15-B 16-A

1. $\sqrt{0,49} + \sqrt{0,64} - \sqrt{0,81} = ?$

A) – 0,6 B) 0,6 C) 0,9 D) 1 E) 2,5

2. $\sqrt[5]{-1} + \sqrt[4]{(-1)^4} - \sqrt[3]{(-1)^3} = ?$

A) – 3 B) – 2 C) – 1 D) 0 E) 1

3. $\sqrt{1 + \frac{24}{25}} + \sqrt{1 + \frac{5}{4}} = ?$

A) – 0,1 B) 0,1 C) 1,9 D) 2,4 E) 2,9

4. $\sqrt{1 - \frac{13}{49}} + \sqrt{1 - \frac{27}{36}} + 2\sqrt{2 + \frac{23}{49}} = ?$

A) $\frac{13}{14}$ B) $\frac{29}{14}$ C) $\frac{9}{2}$ D) $\frac{19}{2}$ E) 10

5. $\sqrt{3^2 . 4^3 . 25} = ?$

A) 300 B) 240 C) 180 D) 120 E) 80

6. $\sqrt{70 . 14 . 20} = ?$

A) 210 B) 170 C) 160 D) 140 E) 70

7. $\sqrt{\left(\frac{4}{5}\right)^{-1} . \left(\frac{1}{5} + 7\right)} = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

8. $\sqrt{\left(\frac{16}{7}\right)^{-1} . \left(1 + \frac{2}{7}\right)} + \sqrt{\frac{7}{80}\left(1 - \frac{2}{7}\right)} = ?$

A) $\frac{1}{7}$ B) 1 C) $\frac{3}{2}$ D) 7 E) 8

9. $\sqrt{2} \cdot \sqrt{3} \cdot \sqrt{4} \cdot \sqrt{5} = ?$

A) $2\sqrt{30}$ B) $4\sqrt{15}$ C) $2\sqrt{12}$ D) 24 E) 30

10. $\sqrt{2} \cdot \sqrt{6} \cdot \sqrt{12} = ?$

A) 8 B) 12 C) 14 D) 16 E) 18

11. $\dfrac{\sqrt{28} \cdot \sqrt{30}}{\sqrt{10} \cdot \sqrt{21}} = ?$

A) $\dfrac{\sqrt{3}}{5}$ B) $\dfrac{\sqrt{3}}{4}$ C) $\dfrac{\sqrt{3}}{2}$ D) $\dfrac{2}{\sqrt{3}}$ E) 2

12. $\dfrac{\sqrt{13} \cdot \sqrt{50}}{\sqrt{104} \cdot 5} = ?$

A) $\dfrac{3}{2}$ B) $\dfrac{2}{3}$ C) $\dfrac{2\sqrt{5}}{3}$ D) $\dfrac{1}{2}$ E) $\dfrac{\sqrt{5}}{4}$

13. $\sqrt[3]{2} \cdot \sqrt[3]{4} \cdot \sqrt[4]{5} \cdot \sqrt[4]{125} = ?$

A) $\sqrt[4]{10}$ B) $\sqrt[4]{20}$ C) 10 D) 100 E) 1000

14. $\sqrt[3]{2} \cdot \sqrt{3} = ?$

A) $\sqrt[6]{12}$ B) $\sqrt[6]{9}$ C) $\sqrt[6]{108}$ D) $\sqrt{6}$ E) 6

15. $\dfrac{\sqrt[3]{16} \cdot \sqrt[4]{8} \cdot \sqrt[6]{32}}{\sqrt{2}} = ?$

A) $\sqrt[4]{2^3}$ B) $\sqrt[4]{2^4}$ C) $\sqrt[4]{2^5}$ D) $\sqrt[4]{2^6}$ E) $4\sqrt[12]{2^5}$

16. $\dfrac{\sqrt{3} \cdot \sqrt[3]{3} \cdot \sqrt[4]{3}}{\sqrt[12]{3}} = ?$

A) $\sqrt[12]{3}$ B) $\sqrt[6]{3}$ C) $\sqrt[4]{3}$ D) $\sqrt{3}$ E) 3

1-B 2-E 3-E 4-C 5-D 6-D 7-A 8-B 9-A 10-B 11-E 12-D 13-C 14-C 15-E 16-E

1. $\sqrt{24} + \sqrt{54} + \sqrt{96} = ?$

A) $9\sqrt{6}$ B) 6 C) $4\sqrt{6}$ D) $3\sqrt{6}$ E) $\sqrt{6}$

2. $\sqrt{2} + \sqrt{8} + \sqrt{32} + \sqrt{128} = ?$

A) $12\sqrt{2}$ B) $15\sqrt{2}$ C) $16\sqrt{2}$ D) $18\sqrt{2}$ E) $19\sqrt{2}$

3. $\sqrt[3]{625} + \sqrt[3]{40} + \sqrt[3]{135} = ?$

A) $10\sqrt{5}$ B) $10\sqrt{3}$ C) $10\sqrt[3]{5}$ D) $5\sqrt[3]{10}$ E) $\sqrt[3]{50}$

4. $\dfrac{\sqrt[4]{32} \cdot \sqrt[3]{250}}{\sqrt[12]{2}} = ?$

A) $\dfrac{10}{\sqrt{2}}$ B) $\dfrac{\sqrt{2}}{10}$ C) $10\sqrt{2}$ D) $\sqrt{20}$ E) $10\sqrt[3]{2}$

5. $\dfrac{\sqrt[3]{-24} \cdot \sqrt[3]{81}}{\sqrt[3]{9}} = ?$

A) $\sqrt[3]{-6}$ B) $-\sqrt{6}$ C) $-\dfrac{1}{\sqrt{6}}$ D) $-\sqrt{12}$ E) -6

6. $\sqrt{5} \cdot (\sqrt{10} + \sqrt{40}) - \sqrt{3} \cdot (\sqrt{6} + 2\sqrt{24})$

A) 6 B) 2 C) 1 D) 0 E) -1

7. $\dfrac{3}{\sqrt{7}}(\sqrt{28} - \sqrt{63}) = ?$

A) $\sqrt{14}$ B) $\sqrt{7}$ C) -1 D) -2 E) -3

8. $\dfrac{\sqrt{27} + \sqrt{36} + \sqrt{45} + \sqrt{54}}{\sqrt{108} + \sqrt{144} + \sqrt{180} + \sqrt{216}} = ?$

A) $\sqrt{\dfrac{1}{8}}$ B) $\sqrt{\dfrac{1}{2}}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{2}$ E) $\dfrac{4}{3}$

9. $\dfrac{\sqrt{a}\,.\,\sqrt[3]{a}\,.\,\sqrt[4]{a}}{\sqrt[6]{a}} = ?$

A) $\sqrt[12]{a}$ B) $\sqrt[72]{a^7}$ C) $\sqrt[4]{a^3}$ D) $\sqrt[12]{a^{11}}$ E) a

10. $a > 0$

$$\frac{\sqrt[2n]{a^{2n}} + \sqrt[2n+1]{a^{2n+1}} + \sqrt[2n+2]{a^{2n+2}}}{\sqrt[2n+3]{(-a)^{2n+3}}} = ?$$

A) -3 B) $-3a$ C) a D) 3a E) 3

11. $x > 0,$

$$\frac{\sqrt{x}\,.\,\sqrt{4x}\,.\,\sqrt{9x}}{\sqrt{16x}} = ?$$

A) $\dfrac{3x}{2}$ B) $\dfrac{3x}{4}$ C) $9\sqrt{x}$ D) $3\sqrt{x}$ E) $\sqrt{x}$

12. $x > 0,$

$$\sqrt{16x^2} + \sqrt{25x^2} + \sqrt{36x^2} = ?$$

A) 12x B) 15x C) $25x^2$ D) $36x^2$ E) 77x

13. $x > 1,$

$$\sqrt{(x-1)^2} + \sqrt[3]{(x+1)^3} + \sqrt[3]{(1-x)^3} = ?$$

A) $x + 1$ B) $1 - x$ C) $3(x - 1)$ D) $3(1 - x)$ E) $\sqrt{1 - x}$

14. $a > b > 0$

$$\frac{\sqrt[4]{(a-b)^4} + \sqrt[6]{(a-b)^6}}{\sqrt[4]{a^4} + \sqrt[5]{(-b)^5}} = ?$$

A) $2b - 2a$ B) $b - a$ C) 2 D) $a - b$ E) $2a - 2b$

15. $$\frac{\sqrt{4x^2-4} + \sqrt{25x^2-25} + \sqrt{49x^2-49}}{\sqrt{49x^2-49}} = ?$$

A) $\sqrt{x^2-1}$ B) 1 C) $2x^2 - 1$ D) 2 E) $2(x^2 - 1)$

16. $$\frac{\sqrt[3]{7}\,.\,\sqrt[3]{9}\,.\,\sqrt[3]{11}}{\sqrt[3]{56}\,.\,\sqrt[3]{72}\,.\,\sqrt[3]{88}} = ?$$

A) $\dfrac{1}{9}$ B) $\dfrac{1}{8}$ C) 2 D) $\sqrt[3]{16}$ E) $\sqrt[3]{54}$

1-A 2-B 3-C 4-C 5-E 6-D 7-E 8-D 9-D 10-A 11-A 12-B 13-A 14-C 15-D 16-B

1. $\sqrt[4]{(\sqrt{3}-\sqrt{2})^4}\,.\,(\sqrt{3}+\sqrt{2}) = ?$

A) 1 B) 2 C) $\sqrt{3}+\sqrt{2}$ D) $\sqrt{6}$ E) 4

2. $\sqrt{(\sqrt{7}-3)^2}+\sqrt{(\sqrt{7}-\sqrt{2})^2}+\sqrt{2} = ?$

A) $\sqrt{7}$ B) 3 C) 4 D) $\sqrt{17}$ E) $\sqrt{42}$

3. $\sqrt{\frac{1}{64}+\frac{1}{36}} = ?$

A) $\frac{24}{5}$ B) $\frac{24}{13}$ C) 1 D) $\frac{5}{24}$ E) $\frac{23}{24}$

4. $\sqrt{20+\sqrt{29-\sqrt{13+\sqrt{9}}}} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

5. $\sqrt[3]{129-\sqrt[4]{261-\sqrt{23+\sqrt[3]{10+\sqrt[3]{-8}}}}} = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

6. $\sqrt[3]{121+\sqrt{20+\sqrt[3]{-60-\sqrt[3]{64}}}} = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

7. $5 = \sqrt{21+\sqrt{9+\sqrt{x-5}}}$

$\Rightarrow x = ?$

A) 44 B) 49 C) 54 D) 56 E) 58

8. $\frac{\sqrt{10!}}{\sqrt{42}\,.\,\sqrt{5!}} = ?$

A) $\sqrt{5}$ B) $12\sqrt{5}$ C) $\sqrt{5!}$ D) $\sqrt{7!}$ E) $\frac{\sqrt{7!}}{5}$

9. $\frac{9}{\sqrt{3}} + \frac{4}{\sqrt{2}} - 3\sqrt{3} + \frac{\sqrt{6}}{\sqrt{3}} = ?$

A) 2 B) 3 C) $2\sqrt{3}$ D) $3\sqrt{2}$ E) $4\sqrt{2}$

10. $\frac{\sqrt{5} + \sqrt{10}}{\sqrt{2}} - \frac{\sqrt{10}}{2} = ?$

A) $\sqrt{3}$ B) 2 C) $\sqrt{5}$ D) $\sqrt{10}$ E) $2\sqrt{5}$

11. $\frac{\sqrt{2} \,.\, \sqrt{2} \,.\, \sqrt{2}}{\sqrt{2} + \sqrt{2} + \sqrt{2}} = ?$

A) $\frac{3}{2}$ B) $\frac{3}{\sqrt{2}}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{2}{\sqrt{3}}$ E) $\frac{2}{3}$

12. $\frac{\sqrt{2}}{\sqrt{5}} + \frac{\sqrt{5}}{\sqrt{2}} = ?$

A) $\sqrt{10}$ B) $\frac{\sqrt{10}}{10}$ C) $\frac{2\sqrt{10}}{10}$ D) $\frac{10\sqrt{10}}{10}$ E) $\frac{7\sqrt{10}}{10}$

13. $\frac{18}{\sqrt{3}} + 4\sqrt{3} + \frac{12}{\sqrt{3}} = ?$

A) $6\sqrt{3}$ B) $10\sqrt{3}$ C) $14\sqrt{3}$ D) $16\sqrt{3}$ E) $22\sqrt{3}$

14. $\left(\frac{\sqrt{45} + \sqrt{75}}{\sqrt{15}}\right) - \left(\frac{\sqrt{36} + \sqrt{48} + \sqrt{60}}{\sqrt{12}}\right) = ?$

A) -2 B) -1 C) $\sqrt{2}$ D) $\sqrt{3}$ E) $2\sqrt{3} + 2\sqrt{5}$

15. $\frac{\sqrt{3} \,.\, \sqrt{4} \,.\, \sqrt{5} \,.\, \sqrt{6}}{\sqrt{6} \,.\, \sqrt{8} \,.\, \sqrt{10} \,.\, \sqrt{12}} = ?$

A) $\frac{1}{\sqrt{2}}$ B) $\frac{1}{2}$ C) $\frac{1}{2\sqrt{2}}$ D) $\frac{1}{4}$ E) $\frac{1}{4\sqrt{2}}$

16. $\frac{\sqrt{5} + \sqrt{10} + \sqrt{15} + \sqrt{20}}{\sqrt{5}} - \frac{\sqrt{24} + \sqrt{6} + \sqrt{18}}{\sqrt{6}} = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt{2} + \sqrt{3}$ D) $2 + 2\sqrt{3}$ E) 3

1-A 2-B 3-D 4-D 5-E 6-E 7-C 8-B 9-D 10-C 11-E 12-E 13-C 14-A 15-D 16-A

1. $\dfrac{3}{\sqrt{7}-2} = ?$

A) $\sqrt{7}+\sqrt{3}$ B) $\sqrt{7}-\sqrt{3}$ C) $\sqrt{7}+2$ D) $\sqrt{7}-\sqrt{2}$ E) $\sqrt{3}+\sqrt{2}$

2. $\dfrac{1}{\sqrt{3}+\sqrt{2}} + \dfrac{1}{\sqrt{4}+\sqrt{3}} + \dfrac{1}{\sqrt{5}+\sqrt{4}} = ?$

A) $\sqrt{5}-\sqrt{2}$ B) $\sqrt{5}+\sqrt{2}$ C) $\sqrt{5}-2$ D) $\sqrt{5}+2$ E) $\sqrt{3}+2$

3. $\dfrac{2}{\sqrt{7}-\sqrt{5}} + \dfrac{2}{\sqrt{7}+\sqrt{5}} = ?$

A) $\sqrt{7}$ B) $2\sqrt{7}$ C) $\sqrt{5}$ D) $2\sqrt{5}$ E) 2

4. $(\sqrt{3}+\sqrt{2}+\sqrt{5}).(\sqrt{3}+\sqrt{2}-\sqrt{5}) = ?$

A) $\sqrt{6}$ B) $2\sqrt{6}$ C) $\sqrt{3}+\sqrt{5}$ D) $2(\sqrt{3}+\sqrt{2})$ E) $\sqrt{2}+\sqrt{3}+\sqrt{5}$

5. $\dfrac{a}{\sqrt{a}} + \dfrac{b}{\sqrt{b}} - \sqrt{a} - \sqrt{b} = ?$

A) a B) $\sqrt{a}$ C) $\sqrt{b}$ D) 0 E) $-a$

6. $x \neq y^2$

$$\frac{1}{\sqrt{x}-y} + \frac{1}{\sqrt{x}+y} = \frac{1}{x-y^2}$$

$\Rightarrow$ x = ?

A) $\dfrac{1}{\sqrt{2}}$ B) $\dfrac{1}{2}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{8}$ E) $\dfrac{1}{9}$

7. $\dfrac{1}{\sqrt{a+1}+\sqrt{a}} + \dfrac{2a}{\sqrt{a}} = \sqrt{2}$

$\Rightarrow$ a = ?

A) $\dfrac{1}{2}$ B) $\dfrac{1}{4}$ C) $\dfrac{1}{8}$ D) $\dfrac{1}{8\sqrt{2}}$ E) $\dfrac{1}{16}$

8. $\dfrac{1}{\sqrt{a}+\sqrt{a+1}} + \dfrac{1}{\sqrt{a+1}+\sqrt{a+2}} = \sqrt{a+2} - \sqrt{3}$

$\Rightarrow$ a = ?

A) 9 B) 6 C) 5 D) 4 E) 3

9. $(\sqrt{3}-\sqrt{2}).(\sqrt{3}+\sqrt{a})=1$

$\Rightarrow$ a = ?

A) 3 B) 2 C) $\sqrt{3}$ D) $\sqrt{2}$ E) 1

10. $\dfrac{3}{\sqrt{8}-\sqrt{5}}-\dfrac{4}{\sqrt{8}-\sqrt{4}}=a$

$\Rightarrow$ a = ?

A) $\sqrt{5}-2$ B) $\sqrt{5}+\sqrt{2}$ C) $\sqrt{5}$ D) $\sqrt{2}$ E) 2

11. $\dfrac{1}{\sqrt{a}-\sqrt{b}}=4,\quad a-b=1$

$\Rightarrow$ $\sqrt{a}+\sqrt{b}$ = ?

A) 1 B) 2 C) $\sqrt{2}$ D) 4 E) 6

12. $\dfrac{a}{b\sqrt{a}}+\dfrac{\sqrt{a}}{b}=3$

$\Rightarrow$ $\sqrt{a}$ = ?

A) $\dfrac{b}{2}$ B) $\dfrac{b}{3}$ C) $\dfrac{3b}{2}$ D) $\dfrac{2b}{3}$ E) b

13. $\dfrac{1}{\sqrt{5}+\sqrt{4}}+\dfrac{1}{\sqrt{5}+\sqrt{6}}+\dfrac{1}{\sqrt{6}+\sqrt{7}}+...+\dfrac{1}{\sqrt{a}+\sqrt{a+1}}=\sqrt{10}-2$

$\Rightarrow$ a = ?

A) 8 B) 9 C) 10 D) 11 E) 12

14. $\dfrac{3\sqrt{2}}{\sqrt{3}}+\dfrac{\sqrt{12}}{\sqrt{2}}-\dfrac{4}{(\sqrt{6}-\sqrt{4})}=?$

A) $2\sqrt{6}$ B) $4\sqrt{6}$ C) $6\sqrt{2}$ D) -4 E) $4-2\sqrt{6}$

15. $\dfrac{1}{4-2\sqrt{3}}-\dfrac{1}{4+2\sqrt{3}}=?$

A) $\sqrt{3}+2$ B) $2-\sqrt{3}$ C) 4 D) $4\sqrt{3}$ E) $\sqrt{3}$

16. $\dfrac{1}{5+2\sqrt{6}}+\dfrac{1}{5-\sqrt{24}}=?$

A) $\sqrt{6}$ B) $2\sqrt{6}$ C) 5 D) 8 E) 10

1-C 2-A 3-B 4-B 5-D 6-C 7-C 8-E 9-B 10-A 11-D 12-C 13-B 14-D 15-E 16-E

1. $\dfrac{3}{\sqrt[3]{3}} = ?$

A) $\sqrt[4]{3}$ B) $\sqrt[4]{9}$ C) $\sqrt[3]{3}$ D) $\sqrt[3]{9}$ E) 3

2. $\dfrac{4}{\sqrt[4]{4}} = ?$

A) $\sqrt[4]{64}$ B) $\sqrt[4]{32}$ C) $\sqrt[4]{16}$ D) $\sqrt[4]{4}$ E) $\sqrt[4]{2}$

3. $7\sqrt{\dfrac{5}{7}} + 5\sqrt{\dfrac{7}{5}} = ?$

A) $\sqrt{35}$ B) $2\sqrt{35}$ C) $2\sqrt{37}$ D) 98 E) 105

4. $a\sqrt{\dfrac{b}{a}} - b\sqrt{\dfrac{a}{b}} = ?$

A) $-\sqrt{ab}$ B) $\sqrt{ab}$ C) 0 D) $\sqrt{a}$ E) $\sqrt{b}$

5. $\dfrac{2}{\dfrac{2}{\sqrt{2}} + \sqrt{2}} = ?$

A) $\sqrt{2}$ B) $\dfrac{\sqrt{2}}{2}$ C) $\dfrac{1}{2}$ D) 2 E) $\dfrac{1}{2\sqrt{2}}$

6. $\dfrac{3}{1 + \dfrac{\sqrt{5}}{5}} + \dfrac{3}{1 - \dfrac{\sqrt{5}}{5}} = ?$

A) $\sqrt{5}$ B) $\sqrt{15}$ C) $\dfrac{5}{2}$ D) $\dfrac{5\sqrt{2}}{2}$ E) $\dfrac{15}{2}$

7. $\dfrac{4}{2 - \dfrac{\sqrt{3}}{2}} + \dfrac{4}{2 + \dfrac{\sqrt{3}}{2}} = ?$

A) $\dfrac{64}{13}$ B) $\dfrac{8}{13}$ C) $\sqrt{13}$ D) $\dfrac{1}{\sqrt{13}}$ E) $\dfrac{1}{4\sqrt{13}}$

8. $\dfrac{\sqrt{7}}{\sqrt{7} + \dfrac{1}{\sqrt{7}}} + \dfrac{1}{8} = ?$

A) $2\sqrt{7}$ B) $2\sqrt{2}$ C) $\sqrt{7}$ D) 1 E) $\dfrac{1}{7}$

9. $\dfrac{\sqrt{2}+\sqrt{3}+2+\sqrt{6}}{\sqrt{2}+\sqrt{3}} = ?$

A) $\sqrt{2}+\sqrt{3}$ B) $\sqrt{2}-\sqrt{3}$ C) $1+\sqrt{3}$ D) $1-\sqrt{2}$ E) $1+\sqrt{2}$

10. $\dfrac{2\sqrt{7}-\sqrt{8}}{\sqrt{7}-\sqrt{2}+\sqrt{21}-\sqrt{6}} = ?$

A) $\sqrt{7}+\sqrt{2}$ B) $\sqrt{7}-\sqrt{2}$ C) $\sqrt{3}-1$ D) $\sqrt{3}+1$ E) $\sqrt{6}+\sqrt{7}$

11. $\dfrac{7-\sqrt{21}}{\sqrt{21}-3} = ?$

A) $\sqrt{7}$ B) 7 C) $\dfrac{21}{\sqrt{3}}$ D) $\sqrt{\dfrac{21}{3}}$ E) $\dfrac{\sqrt{21}}{3}$

12. $\dfrac{6\sqrt{3}-\sqrt{72}}{\sqrt{24}-4} = ?$

A) $\dfrac{3}{2}$ B) $\dfrac{3\sqrt{2}}{2}$ C) 3 D) $3\sqrt{2}$ E) 6

13. $\dfrac{\sqrt{0{,}09}+\sqrt{0{,}04}}{\sqrt{2}+\sqrt{3}} = ?$

A) $\dfrac{\sqrt{3}-\sqrt{2}}{10}$ B) $\dfrac{\sqrt{3}-\sqrt{2}}{2}$ C) $\sqrt{3}-\sqrt{2}$ D) $\sqrt{3}+\sqrt{2}$ E) $\sqrt{6}+\sqrt{10}$

14. $\dfrac{\sqrt{10}}{\sqrt{0{,}4}-\sqrt{0{,}9}} = ?$

A) -10 B) $-\sqrt{10}$ C) $\sqrt{10}$ D) 10 E) 100

15. $\sqrt{32}+3\sqrt{8} = a\sqrt{2}$

$\Rightarrow a\sqrt{10} = ?$

A) $2\sqrt{10}$ B) $3\sqrt{10}$ C) $8\sqrt{10}$ D) $9\sqrt{10}$ E) $10\sqrt{10}$

16. $\dfrac{b\sqrt{a}-a\sqrt{b}}{\sqrt{b}-\sqrt{a}} = ?$

A) $-\sqrt{a}$ B) $-\sqrt{b}$ C) $\sqrt{a}$ D) $\sqrt{b}$ E) $\sqrt{ab}$

1-D 2-A 3-B 4-C 5-B 6-E 7-A 8-D 9-E 10-C 11-E 12-B 13-B 14-A 15-E 16-E

1. $\sqrt{\sqrt{19}-\sqrt{3}}\,.\,\sqrt{\sqrt{19}+\sqrt{3}}=?$

A) 16 B) $2\sqrt{2}$ C) 4 D) 2 E) $\sqrt{2}$

2. $\sqrt{\sqrt{28}+\sqrt{4}}\,.\,\sqrt{\sqrt{28}-\sqrt{4}}=?$

A) $2\sqrt{6}$ B) $\sqrt{28}$ C) $\sqrt{30}$ D) $4\sqrt{2}$ E) $\sqrt{35}$

3. $\sqrt{\sqrt{57}-2\sqrt{2}}\,.\,\sqrt{\sqrt{57}+2\sqrt{2}}=?$

A) $\sqrt{57}$ B) $\sqrt{56}$ C) $\sqrt{52}$ D) $\sqrt{50}$ E) 7

4. $\sqrt{3\sqrt{7}+3\sqrt{3}}\,.\,\sqrt{3\sqrt{7}-3\sqrt{3}}=?$

A) 63 B) 49 C) 36 D) 6 E) $2\sqrt{7}$

5. $\sqrt[4]{32}+\sqrt[4]{162}=?$

A) $\sqrt[3]{15}$ B) $\sqrt[5]{12}$ C) $5\sqrt[4]{2}$ D) $5\sqrt[4]{8}$ E) 10

6. $\sqrt[3]{24}+\dfrac{\sqrt[3]{162}}{\sqrt[3]{2}}$

A) $\sqrt[6]{15}$ B) $\sqrt[3]{5}$ C) $\sqrt[3]{15}$ D) $\sqrt[3]{50}$ E) $5\sqrt[3]{3}$

7. $\sqrt[3]{-16}+\sqrt[3]{-54}+\sqrt[3]{-128}+\sqrt[3]{-250}=?$

A) $-20\sqrt[3]{2}$ B) $-16\sqrt[3]{2}$ C) $-14\sqrt[3]{2}$ D) $10\sqrt[3]{2}$ E) $14\sqrt[3]{2}$

8. $\sqrt[12]{2^3\,.\,4\,.\left(\frac{1}{2}\right)^{-7}}=?$

A) 1 B) 2 C) 4 D) 8 E) $\sqrt[3]{180}$

9. $\sqrt[5]{3^4 \cdot 3^{-7} \cdot \left(\frac{1}{9}\right)^{-10}} = 3^x$

$\Rightarrow$ x = ?

A) $\frac{17}{5}$ B) $\frac{12}{5}$ C) $\frac{11}{5}$ D) $\frac{7}{5}$ E) $\frac{6}{5}$

10. $\sqrt{\frac{\sqrt{2} \cdot 4}{\sqrt[3]{2}}} = 2^x$

$\Rightarrow$ x = ?

A) $\frac{12}{13}$ B) $\frac{13}{14}$ C) $\frac{14}{15}$ D) 1 E) $\frac{13}{12}$

11. $\frac{\sqrt{9^{x+2}}}{\sqrt[3]{27^{3-x}}} = 27$

$\Rightarrow$ x = ?

A) – 1 B) 0 C) 1 D) 2 E) $\frac{5}{2}$

12. $\frac{\sqrt{4^{a+1}}}{\sqrt[4]{2^{4a+12}}} = 2^{a+3}$

$\Rightarrow$ a = ?

A) – 3 B) – 5 C) – 6 D) – 7 E) – 8

13. $\sqrt{\sqrt{11} - \sqrt{3}} \cdot \sqrt{\sqrt{11} + \sqrt{3}} \cdot \sqrt{2} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

14. $\sqrt[2a]{2^a \cdot 2^{a+1} \cdot 2^{a+1}} = 4$

$\Rightarrow$ a = ?

A) 2 B) 3 C) 4 D) 5 E) 6

15. $\frac{\sqrt[5]{2^{5a+15}}}{\sqrt[12]{2^{24a}}} = 24$

$\Rightarrow$ 2^{-a} = ?

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 3 E) 6

16. $\sqrt{2^a - \sqrt{3}} \cdot \sqrt{2^a + \sqrt{3}} = \sqrt{13}$

$\Rightarrow$ a = ?

A) 1 B) 2 C) 4 D) 8 E) 16

1-C 2-A 3-E 4-D 5-C 6-E 7-C 8-B 9-A 10-E 11-D 12-B 13-D 14-A 15-D 16-B

1. $\sqrt[3]{4} \cdot \sqrt[5]{2} = 2^x$

$\Rightarrow$ x = ?

A) $\frac{11}{15}$ B) $\frac{12}{15}$ C) $\frac{13}{15}$ D) $\frac{14}{15}$ E) 1

2. $\sqrt[3]{7} \cdot \sqrt{7} = \sqrt[6]{7^x}$

$\Rightarrow$ x = ?

A) 4 B) 5 C) 6 D) 7 E) 8

3. $\sqrt[3]{4 \cdot \sqrt{4 \cdot \sqrt{2}}} = 2^a$

$\Rightarrow$ a = ?

A) $\frac{7}{6}$ B) $\frac{13}{12}$ C) 1 D) $\frac{11}{12}$ E) $\frac{5}{6}$

4. $\sqrt{\sqrt{2} \cdot \sqrt[3]{2}} = 2^m$

$\Rightarrow$ m = ?

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

5. $\sqrt{4 + 2\sqrt{3}} \cdot \sqrt{4 - 2\sqrt{3}} = ?$

A) $2\sqrt{3}$ B) 2 C) $\sqrt{3}$ D) 1 E) -2

6. $\sqrt{7 + \sqrt{40}} - \sqrt{5} = ?$

A) $2\sqrt{5} - \sqrt{2}$ B) $2\sqrt{5} + \sqrt{2}$ C) $2\sqrt{5}$ D) $\sqrt{5}$ E) $\sqrt{2}$

7. $\sqrt{6 + 2\sqrt{8}} - \sqrt{6 + 4\sqrt{2}} = ?$

A) $4 + 2\sqrt{2}$ B) $4 - 2\sqrt{2}$ C) $2 + \sqrt{2}$ D) 0 E) $-2 - \sqrt{2}$

8. $\sqrt{5 + x + 2\sqrt{5x}} = \sqrt{x} + \sqrt{a}$

$\Rightarrow$ a = ?

A) $\sqrt{5}$ B) $\sqrt{6}$ C) 3 D) 4 E) 5

9. $\sqrt{3+\sqrt{5}}+\sqrt{3-\sqrt{5}}=?$

A) $2\sqrt{5}$ B) $\sqrt{15}$ C) $\sqrt{10}$ D) 3 E) $\sqrt{8}$

10. $\sqrt{7\,.\,\sqrt{7\,.\,\sqrt{7\,.\,\sqrt{7\,...}}}}=?$

A) 1 B) 4 C) 7 D) 35 E) 49

11. $\sqrt[4]{27\,.\,\sqrt[4]{27\,.\,\sqrt[4]{27\,...}}}=?$

A) 12 B) 9 C) 7 D) 4 E) 3

12. $\sqrt[5]{64:\sqrt[5]{64:\sqrt[5]{64:...}}}=?$

A) $\sqrt[3]{2^6}$ B) $\sqrt[3]{2^5}$ C) $\sqrt[3]{2^4}$ D) 2 E) 1

13. $\sqrt{20+\sqrt{20+\sqrt{20+...}}}-\sqrt{30-\sqrt{30-...}}=?$

A) 0 B) 1 C) 2 D) $\frac{5}{2}$ E) $\sqrt{5}-\sqrt{2}$

14. $\sqrt{a-\sqrt{a-\sqrt{a-...}}}=4$

$\Rightarrow$ a = ?

A) $\sqrt{5}$ B) $2\sqrt{5}$ C) 6 D) $3\sqrt{2}$ E) 20

15. $\sqrt[3]{2\,.\,\sqrt[5]{3\,.\,\sqrt[3]{2\,.\,\sqrt[5]{3\,.\,...}}}}=?$

A) $\sqrt{18}$ B) $\sqrt{12}$ C) $\sqrt{6}$ D) $\sqrt[14]{96}$ E) $\sqrt[14]{18}$

16. $\sqrt{a-\sqrt{5-\sqrt{a-\sqrt{5-...}}}}=4$

$\Rightarrow$ a = ?

A) 17 B) 16 C) 9 D) 5 E) 4

1-C 2-B 3-B 4-D 5-B 6-E 7-D 8-E 9-C 10-C 11-E 12-D 13-A 14-E 15-D 16-A

1. $\sqrt{x+\sqrt{x+\sqrt{x+\ldots}}}+x=4$

$\Rightarrow$ $x=?$

A) 1 B) 2 C) 4 D) 6 E) 7

2. $\dfrac{\sqrt[5]{81\,.\,\sqrt[5]{81\,.\,\sqrt[5]{81\,.\,\ldots}}}}{\sqrt[5]{64:\sqrt[5]{64:\sqrt[5]{64:\ldots}}}}=?$

A) $\frac{9}{4}$ B) $\frac{9}{2}$ C) $\frac{5}{2}$ D) $\frac{3}{2}$ E) 1

3. $\sqrt{\sqrt{90+\sqrt{90+\sqrt{90+\ldots}}}}+a=\sqrt{12+2\sqrt{20}}$

$\Rightarrow$ $a^2=?$

A) 1 B) 2 C) 4 D) 6 E) 7

4. $\sqrt[4]{x+2+\sqrt[4]{x+2+\sqrt[4]{x+2+\sqrt{\ldots}}}}=2$

$\Rightarrow$ $x=?$

A) 12 B) 10 C) 8 D) 9 E) 4

5. $x=\sqrt[3]{5}$

$y=\sqrt[3]{7}$

$z=\sqrt[3]{9}$

$\Rightarrow$ $?>?>?$

A) $x>y>z$ B) $x>z>y$ C) $y>z>x$ D) $y>x>z$ E) $z>y>x$

6. $a=2\sqrt{7}$

$b=3\sqrt{2}$

$c=4\sqrt{3}$

$\Rightarrow$ $?>?>?$

A) $b>a>c$ B) $b>c>a$ C) $c>a>b$ D) $c>b>a$ E) $a>b>c$

7. $a=\sqrt[3]{4}$

$b=\sqrt{8}$

$c=\sqrt[4]{2}$

$\Rightarrow$ $?>?>?$

A) $b>c>a$ B) $c>a>b$ C) $a>b>c$ D) $a>c>b$ E) $b>a>c$

8. $a=\dfrac{1}{\sqrt[3]{5}}$

$b=\dfrac{1}{\sqrt[4]{4}}$

$c=\dfrac{1}{\sqrt[5]{3}}$

$\Rightarrow$ $?>?>?$

A) $a>c>b$ B) $a>b>c$ C) $b>a>c$ D) $c>b>a$ E) $c>a>b$

9. $x \cdot \sqrt{0,18} = 3$

$\Rightarrow$ **x = ?**

A) $18\sqrt{3}$ B) $9\sqrt{2}$ C) $6\sqrt{2}$ D) $5\sqrt{2}$ E) $4\sqrt{2}$

10. $\dfrac{\sqrt[3]{3} \cdot \sqrt{27}}{\sqrt[3]{9} \cdot \sqrt{3}} = ?$

A) 3 B) $\sqrt{3}$ C) $\sqrt[3]{9}$ D) $3\sqrt[3]{3}$ E) $\sqrt[6]{3}$

11. $\dfrac{3^4 + 1}{\sqrt[4]{3^5}} = ?$

A) $\dfrac{\sqrt[5]{3^4} - 2}{81}$ B) $\dfrac{82}{\sqrt[4]{3}}$ C) $\dfrac{\sqrt[4]{3} - 3^4}{\sqrt[4]{3}}$ D) $\dfrac{\sqrt[4]{9} + 3^4}{3}$ E) $\dfrac{82\sqrt[4]{27}}{9}$

12. $\dfrac{x}{y} \cdot \sqrt[3]{\dfrac{y}{x} \cdot \sqrt{\dfrac{x}{y}}} = ?$

A) $\sqrt[6]{\left(\dfrac{x}{y}\right)^5}$ B) $\sqrt[6]{\left(\dfrac{y}{x}\right)^5}$ C) $\sqrt[6]{\dfrac{x}{y}}$ D) $\sqrt[5]{\left(\dfrac{x}{y}\right)^6}$ E) $\sqrt[5]{\left(\dfrac{y}{x}\right)^6}$

13. $b = \dfrac{\sqrt{2a} \cdot \sqrt[6]{a^3}}{\sqrt{8} + 4}$

$a = 2 + \sqrt{2}$

$\Rightarrow$ **b = ?**

A) $\dfrac{\sqrt{2}}{2}$ B) $\sqrt{2}$ C) $\dfrac{2}{\sqrt{2}}$ D) 2 E) 4

14. $4^x = 5$

$9^y = 7$

$\Rightarrow$ $2^{3x} \cdot 3^{3y} = ?$

A) 35^2 B) $35\sqrt{35}$ C) $35\sqrt{7}$ D) $35\sqrt{5}$ E) 35

15. $\sqrt{243x + 81} - 12 = \sqrt{27x + 9}$

$\Rightarrow$ **x = ?**

A) $\dfrac{1}{6}$ B) $\dfrac{1}{3}$ C) 1 D) 3 E) 6

16. $\dfrac{a\sqrt{b} + b\sqrt{a}}{\sqrt{a^3b^3}} - \dfrac{1}{b\sqrt{a}} = ?$

A) $\dfrac{1}{b\sqrt{a}}$ B) $\dfrac{1}{ab}$ C) $\dfrac{1}{a\sqrt{b}}$ D) $\dfrac{1}{\sqrt{a}}$ E) $\dfrac{1}{\sqrt{b}}$

1-B 2-D 3-B 4-A 5-E 6-C 7-E 8-D 9-D 10-A 11-E 12-A 13-A 14-B 15-C 16-C

1. $\sqrt{\dfrac{2-\sqrt{3}}{2+\sqrt{3}}} - \sqrt{\dfrac{2+\sqrt{3}}{2-\sqrt{3}}} = ?$

A) $-2\sqrt{3}$ B) $-\sqrt{3}$ C) $\sqrt{3}$ D) 2 E) 4

2. $x = \dfrac{\sqrt{3}+\sqrt{5}}{2}$

$y = \dfrac{\sqrt{3}-\sqrt{5}}{2}$

$\Rightarrow \dfrac{x}{y} + \dfrac{y}{x} = ?$

A) $8 + 2\sqrt{15}$ B) $8 - \sqrt{15}$ C) $12 + \sqrt{15}$ D) -8 E) $12 - 2\sqrt{15}$

3. $a = 18{,}13$

$b = 15{,}63$

$\Rightarrow \sqrt{-4ab + (a+b)^2} = ?$

A) $\dfrac{3}{2}$ B) $\dfrac{5}{2}$ C) 3 D) 3,12 E) 3,51

4. $\sqrt{\dfrac{1}{3} + \dfrac{1}{4} + \dfrac{1}{9}} = ?$

A) $\dfrac{2}{3}$ B) $\dfrac{5}{6}$ C) 1 D) $\dfrac{6}{5}$ E) $\dfrac{9}{4}$

5. $\dfrac{5}{\sqrt{5} - \dfrac{1}{\sqrt{5} - \dfrac{2}{\sqrt{5}}}} = ?$

A) $\sqrt{15}$ B) $\sqrt{18}$ C) $\sqrt{\dfrac{38}{2}}$ D) $\dfrac{3\sqrt{5}}{4}$ E) $\dfrac{3\sqrt{5}}{2}$

6. $\sqrt{\dfrac{9}{16} - 2 + \dfrac{16}{9}} = ?$

A) $-\dfrac{7}{12}$ B) $-\dfrac{1}{12}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{2}$ E) $\dfrac{7}{12}$

7. $\sqrt{190 \cdot 200 + 25} = ?$

A) 185 B) 190 C) 195 D) 200 E) 225

8. $(2\sqrt{5} + 5\sqrt{2})^2 - (2\sqrt{5} - 5\sqrt{2})^2 = ?$

A) $50\sqrt{10}$ B) $40\sqrt{10}$ C) $30\sqrt{10}$ D) $20\sqrt{10}$ E) $10\sqrt{10}$

9. $x = \sqrt{7} - 2$

$y = \sqrt{7} + 2$

$\Rightarrow \sqrt{x^2 - 2xy + y^2} = ?$

A) 16 B) 4 C) $\sqrt{7}$ D) 2 E) $\frac{\sqrt{7}}{2}$

10. $a = \sqrt{2}$

$b = \sqrt{3}$

$c = \sqrt{5}$

$\Rightarrow \sqrt{360} = ?$

A) ab^3c^2 B) ab^2c^3 C) a^2bc^3 D) a^3b^2c E) a^2b^2c

11. $x > 2$

$\Rightarrow \sqrt{2x + 2\sqrt{x^2 - 4}} + \sqrt{2x - 2\sqrt{x^2 - 4}} = ?$

A) $\sqrt{x^2 - 4}$ B) $2\sqrt{x - 2}$ C) $2\sqrt{x + 2}$ D) $\sqrt{x^2 + 4}$ E) $\sqrt{x - 2}$

12. $2x + x\sqrt{3} - 1 = 0$

$\Rightarrow x + \sqrt{3} = ?$

A) $2 - 2\sqrt{3}$ B) $2 - \sqrt{3}$ C) $2\sqrt{3}$ D) $\sqrt{3}$ E) 2

13. $-3 > x > -4$

$\Rightarrow \sqrt{x^2 + 6x + 9} - \sqrt{x^2 + 8x + 16} = ?$

A) $-2x$ B) $-2x + 7$ C) $-2x - 7$ D) -7 E) 7

14. $x = \sqrt{3} + 5$

$\Rightarrow (x - 2).(x - 4).(x - 6).(x - 8) = ?$

A) 16 B) 12 C) 6 D) -12 E) -18

15. $\frac{x - y}{x\sqrt{y} + y\sqrt{x}} = \frac{2}{\sqrt{x}}$

$\Rightarrow \frac{\sqrt{y}}{\sqrt{x}} = ?$

A) 16 B) 9 C) 3 D) 2 E) $\frac{1}{3}$

16. $\sqrt[3]{\frac{162}{\sqrt{27} - \sqrt{3}}} = ?$

A) $3\sqrt[6]{3}$ B) $2\sqrt[6]{3}$ C) $\sqrt[6]{3}$ D) $3\sqrt[4]{3}$ E) $3\sqrt{3}$

1-A 2-D 3-B 4-B 5-E 6-E 7-C 8-B 9-B 10-D 11-C 12-E 13-C 14-D 15-E 16-A

1. $\frac{1}{\sqrt{3x}} + \frac{6}{\sqrt{27x}} = 12$

$\Rightarrow$ **x = ?**

A) $\frac{1}{48}$ B) $\frac{1}{36}$ C) $\frac{1}{24}$ D) $\frac{1}{12}$ E) $\frac{1}{6}$

2. $a = \sqrt{9} + \sqrt{6}$

$b = \sqrt{10} + \sqrt{5}$

$c = \sqrt{8} + \sqrt{7}$

$\Rightarrow$ **? > ? > ?**

A) c > b > a B) c > a > b C) a > b > c

D) a > c > b E) b > a > c

3. $\sqrt{\frac{\sqrt{x}+3}{\sqrt{x}-3}} = \sqrt{x} + 3$

$\Rightarrow$ **x = ?**

A) 3 B) 6 C) 9 D) 10 E) 11

4. $(\sqrt{5} + \sqrt{2})^x = 3$

$\Rightarrow$ $(\sqrt{5} - \sqrt{2})^x = ?$

A) 3^{x-1} B) 3^x C) 3^{x+1} D) 3^{2x} E) 3^{2x+1}

5. $x\left(\sqrt{\frac{1}{x} + \frac{1}{x^2}}\right) = \frac{3}{2}$

$\Rightarrow$ **x = ?**

A) $\frac{4}{5}$ B) $\frac{5}{4}$ C) $\frac{5}{3}$ D) $\frac{5}{2}$ E) 5

6. $x = \sqrt{75} - \sqrt{50}$

$y = \sqrt{48} + \sqrt{32}$

$\Rightarrow$ **x . y = ?**

A) $16\sqrt{6}$ B) $18\sqrt{2}$ C) 20

D) $20\sqrt{3}$ E) $20\sqrt{6}$

7. $x - 3\sqrt{x} - 4 = 0$

$\Rightarrow$ $\frac{6x}{(x-4)^2} = ?$

A) $\frac{6}{5}$ B) $\frac{5}{4}$ C) $\frac{3}{4}$ D) $\frac{2}{3}$ E) $\frac{1}{3}$

8. x = 0,444 . . .

$\Rightarrow$ $\sqrt{\frac{1}{x}} = ?$

A) $\frac{7}{2}$ B) 3 C) $\frac{5}{2}$ D) 2 E) $\frac{3}{2}$

9. $\sqrt[3]{54} - \dfrac{6}{\sqrt[3]{54}} + \sqrt[3]{4} = ?$

A) $3\sqrt[6]{2}$ B) $3\sqrt[3]{2}$ C) $3\sqrt[3]{3}$ D) $3\sqrt{2}$ E) $2\sqrt[3]{5}$

10. $x < y < 0$

$\sqrt{x^2 + 6xy + 9y^2} + \sqrt{x^2 - 2xy + y^2} - \sqrt{4x^2} = 8$

$\Rightarrow$ **y = ?**

A) -4 B) -3 C) -2 D) -1 E) $-\dfrac{1}{2}$

11. $\sqrt[3]{4\sqrt[4]{x}} = \sqrt[3]{4} \cdot \sqrt{3}$

$\Rightarrow$ **x = ?**

A) 2^6 B) 3^6 C) 3^7 D) 4^6 E) 4^7

12. $x = \sqrt{a^3 + 1}$

$y = a^2 - a + 1$

$\Rightarrow$ $x^3 \cdot y^{-\frac{1}{2}} = ?$

A) $(a^3 - 1)\sqrt{a^3 + 1}$ B) $(a^3 + 1)\sqrt{a + 1}$ C) $(a^3 + 1)\sqrt{a - 1}$ D) $\sqrt{a^3 + 1}$ E) $(a^3 - 1)\sqrt{a + 1}$

13. $\sqrt{x + \sqrt{x}} - \sqrt{x - \sqrt{x}} = 4$

$\Rightarrow$ **x = ?**

A) $\dfrac{63}{15}$ B) $\dfrac{64}{15}$ C) $\dfrac{69}{15}$ D) $\dfrac{71}{15}$ E) $\dfrac{72}{15}$

14. $a, b, c \in R^+$

$\dfrac{a}{3} = \dfrac{b}{5} = c^2$

$\Rightarrow$ $\sqrt{3a} + \sqrt{5b} = ?$

A) $-8c$ B) $-8a$ C) $8b$ D) $4c$ E) $8c$

15. $x > y,$

$\sqrt{\dfrac{3^x}{3^{-y}}\left(-2 + \dfrac{3^x}{3^y} + \dfrac{3^y}{3^x}\right)} = ?$

A) 3^{2x+2y} B) $3^x + 3^y$ C) $3^x - 3^y$ D) 3^{x+y} E) 3^{x-y}

16. $A = \sqrt{3} + \sqrt{2}$

$B = \sqrt{3} - \sqrt{2}$

$\Rightarrow$ $\left(\dfrac{A + B}{A - B}\right)^{-\frac{1}{2}} = ?$

A) $\sqrt{\dfrac{4}{3}}$ B) $\sqrt{\dfrac{2}{3}}$ C) $\sqrt{\dfrac{3}{2}}$ D) $\sqrt[4]{\dfrac{2}{3}}$ E) $\sqrt[4]{\dfrac{3}{2}}$

1-A 2-B 3-D 4-A 5-B 6-C 7-D 8-E 9-B 10-A 11-B 12-B 13-B 14-E 15-C 16-D

ÜNİTE 6

Unit 6

Çarpanlara Ayırma / Factorising

1. $\dfrac{204 \,.\, 103 + 204 \,.\, 107}{102 \,.\, 99 + 111 \,.\, 102} = ?$

A) 204 B) 102 C) 99 D) 2 E) 1

2. $\dfrac{6xy + 9xy^2}{2 + 3y} = ?$

A) $-5xy$ B) $-3xy$ C) $2xy$ D) $3xy$ E) xy

3. $\dfrac{a + a^2}{a^3 + a^2} = ?$

A) $\dfrac{1}{a^3}$ B) $\dfrac{1}{a^2}$ C) $\dfrac{1}{a}$ D) 1 E) a

4. $\dfrac{1 + a + a^2 + a^3}{a^2 + 1} - 1 = ?$

A) $a + 1$ B) a C) $a - 1$ D) $a^2 + 1$ E) a^2

5. $\dfrac{3x^2y + 4xy^2}{xy} = ?$

A) $3x + 4y$ B) $3x - 4y$ C) $3x - y$ D) $4x - 3y$ E) $4x + 3y$

6. $\dfrac{8x - 2xy}{3x^2y - 12x^2} = ?$

A) $-\dfrac{3}{2}$ B) $-\dfrac{3x}{2}$ C) $-\dfrac{2x}{3}$ D) $-\dfrac{3}{2x}$ E) $-\dfrac{2}{3x}$

7. $\dfrac{3a - 3b}{a - b} + \dfrac{4a - 4b}{2b - 2a} + \dfrac{b + a}{3a + 3b} = ?$

A) $\dfrac{1}{3}$ B) $\dfrac{2}{3}$ C) 1 D) $\dfrac{4}{3}$ E) $\dfrac{5}{3}$

8. $\dfrac{2xy^2}{xy} + \dfrac{(x - y)^2}{x - y} + \dfrac{3x^3y^2}{x^2y^2} = ?$

A) $y - 4x$ B) $y + 4x$ C) $x - 4y$ D) $x + 4y$ E) $4x + 4y$

9. $\dfrac{ax + by - ay - bx}{a - b} = ?$

A) $b - y$ B) $a - x$ C) $a - b$ D) $x + y$ E) $x - y$

10. $\dfrac{m(a - b) + n(b - a) + m(b - a)}{b - a} = ?$

A) m B) $a - b$ C) $b - a$ D) n E) $-n$

11. $\dfrac{x^3 + x^2 + x + (x^2 + x + 1)^2}{(x^2 + x + 1)^2 + x^2 + x + 1} = ?$

A) $\dfrac{x^2 + 2x + 1}{x^2 + x + 2}$ B) $\dfrac{x^2 + x + 1}{x^2 + x + 2}$ C) $\dfrac{x^2 + 2x + 2}{x^2 + x + 1}$ D) $\dfrac{x^2 + x}{x^2 + 1}$ E) $\dfrac{x^2 - x}{x^2 + x + 1}$

12. $\dfrac{a^3 - 2a^2 + a - 2}{a^2 + 1} = ?$

A) a B) $a + 2$ C) $a - 2$ D) $a^2 + 1$ E) $a^2 - 1$

13. $\dfrac{21a - 28b + 39a^2b - 52ab^2}{7 + 13ab} = ?$

A) $3b - 4a$ B) $3a - 4b$ C) $3a + 4b$ D) $7 + 13ab$ E) $7 + 13a$

14. $\dfrac{ax + by - ab - xy}{a(x - b)} = ?$

A) $\dfrac{y - a}{a}$ B) $1 - \dfrac{y}{a}$ C) $\dfrac{y - b}{a}$ D) $\dfrac{y}{a} + 1$ E) $\dfrac{y}{x} + \dfrac{b}{a}$

15. $1000x + 1000y = 1000 \,.\, 999$

$x = 99$

$\Rightarrow y = ?$

A) 90 B) 888 C) 899 D) 900 E) 1000

16. $a > b$

$\dfrac{\sqrt{(a - b)^2} + \sqrt{(b - a)^2}}{(a - b)} = ?$

A) 4 B) 3 C) 2 D) -1 E) -2

1-D 2-D 3-C 4-B 5-A 6-E 7-D 8-B 9-E 10-D 11-A 12-C 13-B 14-B 15-D 16-C

TEST 2

1. $\dfrac{x^2+5x+4}{x^2-2x-3}=?$

A) $\dfrac{x-4}{x+3}$ B) $\dfrac{x+3}{x-4}$ C) $\dfrac{x+4}{x-3}$ D) $\dfrac{x-3}{x+4}$ E) $\dfrac{x+3}{x+4}$

2. $\dfrac{a^2-4a+3}{a^2-7a+6}=?$

A) $\dfrac{a-3}{a+6}$ B) $\dfrac{a-3}{a-6}$ C) $\dfrac{a+3}{a+6}$ D) $\dfrac{a+6}{a-3}$ E) $\dfrac{a-6}{a-3}$

3. $\dfrac{m^2+8m+15}{m^2+7m+10}=?$

A) $\dfrac{m+5}{m+2}$ B) $\dfrac{m+3}{m+5}$ C) $\dfrac{m+5}{m+7}$ D) $\dfrac{m+3}{m+2}$ E) $\dfrac{m+2}{m+3}$

4. $\dfrac{a^2+11a-12}{a^2+5a-6}:\dfrac{a+12}{a+6}=?$

A) 1 B) -1 C) $\dfrac{a+2}{a+6}$ D) $\dfrac{a+12}{a-6}$ E) $\dfrac{a-12}{a-6}$

5. $\dfrac{x+1}{x-2}:\dfrac{x^2-2x-3}{x^2-5x+6}=?$

A) $\dfrac{x+1}{x-2}$ B) $\dfrac{x-2}{x+1}$ C) 1 D) $\dfrac{x-3}{x-2}$ E) $\dfrac{x-2}{x-3}$

6. $\dfrac{x^2-7x+6}{x^2-8x+12}:\dfrac{2x-2}{3x-6}=?$

A) $\dfrac{3}{2}$ B) $\dfrac{x-2}{x-1}$ C) $\dfrac{x-1}{x-2}$ D) $\dfrac{x-1}{x-6}$ E) $\dfrac{2}{3}$

7. $\dfrac{x^2+3x+ax+3a}{x^2-5x-24}=\dfrac{x+5}{x-8}$

$\Rightarrow$ a = ?

A) -24 B) -8 C) -2 D) 3 E) 5

8. $\dfrac{x^2-xy-2y^2}{x^2+3xy+2y^2}=\dfrac{2}{3}$

$\Rightarrow \dfrac{x}{y}=?$

A) 12 B) 10 C) $\dfrac{1}{3}$ D) $-\dfrac{1}{3}$ E) -10

9. $\dfrac{5x^2 - 2x - 3}{4x^2 - x - 3} = ?$

A) $\dfrac{5x-3}{4x-4}$ B) $\dfrac{5x+3}{x-3}$ C) $\dfrac{4x-3}{5x+4}$ D) $\dfrac{5x-3}{3x-4}$ E) $\dfrac{5x+3}{4x+3}$

10. $\dfrac{2x^2 + 7x - 15}{2x^2 - x - 3} = ?$

A) $\dfrac{x+1}{x+5}$ B) $\dfrac{x+5}{x+1}$ C) $\dfrac{x-5}{x-1}$ D) $\dfrac{x-1}{x+5}$ E) $\dfrac{2x+3}{2x+1}$

11. $\dfrac{12x^2 - 5x - 2}{4x^2 - 11x - 3} : \dfrac{6x-4}{x-3} = ?$

A) $\dfrac{1}{2}$ B) $\dfrac{x-3}{3x-2}$ C) $\dfrac{4x+3}{5x+3}$ D) $\dfrac{2x-3}{2x+1}$ E) 2

12. $\dfrac{3m^2 + 4mn + n^2}{9m + 3n} = ?$

A) $\dfrac{6}{m+n}$ B) $\dfrac{3}{3m+n}$ C) $\dfrac{m-n}{3}$ D) $\dfrac{m+n}{3}$ E) $\dfrac{3m+n}{3}$

13. $\dfrac{2x^2 + 2ax + x + a}{2x^2 + 7x + 3} = \dfrac{x+7}{x+3}$

$\Rightarrow$ a = ?

A) 3 B) 4 C) 5 D) 6 E) 7

14. $\dfrac{a^2 + 4a}{a^2 + 6a + 8} = ?$

A) $\dfrac{a+4}{a}$ B) $\dfrac{a}{a+4}$ C) $\dfrac{a+2}{2}$ D) $\dfrac{a}{a+2}$ E) 1

15. $\dfrac{a^2 + 4a}{a^2 + 6a + 8} \cdot \dfrac{a^2 + 5a + 6}{-a^2 - 3a} = ?$

A) $\dfrac{a+3}{a+4}$ B) $\dfrac{a+3}{a-3}$ C) -1 D) 1 E) 2

16. $\dfrac{x^2 + ax + 15}{x^2 + 9x + 20} = \dfrac{x+3}{x+4}$

$\Rightarrow$ a = ?

A) 8 B) 7 C) 6 D) 3 E) -3

1-C 2-B 3-D 4-A 5-C 6-A 7-E 8-B 9-E 10-B 11-A 12-D 13-E 14-D 15-C 16-A

1. $x \neq y$

$$\frac{2x^2 + xy - 3y^2}{3x^2 - xy - 2y^2} = 4$$

$$\Rightarrow \frac{x}{y} = ?$$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) 1 D) $\frac{1}{2}$ E) 2

2. $$\frac{x^2 + x\left(\frac{1}{a} + a\right) + 1}{x^2 + \frac{3x}{a} + \frac{2}{a^2}} = 3$$

$$\Rightarrow \frac{a^2 - 6}{ax} = ?$$

A) -2 B) $-\sqrt{2}$ C) 0 D) 1 E) 2

3. $$\frac{x^2 - \frac{x}{m} - \frac{6}{m^2}}{x - \frac{3}{m}} - x = ?$$

A) $-m$ B) $\frac{3}{m}$ C) $\frac{m}{3}$ D) $\frac{m}{2}$ E) $\frac{2}{m}$

4. $$\frac{x^2 + 2xy - 3y^2}{x^2 + 8xy + 15y^2} = ?$$

A) $\frac{x - y}{x + 5y}$ B) $\frac{x + y}{x + 5y}$ C) $\frac{x - 5y}{x + y}$ D) $\frac{x + 5y}{x - y}$ E) $\frac{x - 5y}{x + 5y}$

5. $$\frac{a^3 - 7a^2 + 12a}{a^3 + a^2 - 12a} = ?$$

A) $\frac{a - 4}{a + 4}$ B) $\frac{a + 4}{a - 4}$ C) $\frac{a - 3}{a + 3}$ D) $\frac{a + 3}{a - 3}$ E) $\frac{a + 3}{a + 4}$

6. $$\frac{x^2 + mx - 2m^2}{x^2 + 9mx + 14m^2} = ?$$

A) $\frac{x + m}{x - 7m}$ B) $\frac{x - m}{x + 7m}$ C) $\frac{x + 2m}{x + 7m}$ D) $\frac{x - m}{x + 2m}$ E) $\frac{x + m}{x + 2m}$

7. $$\frac{a^2 + \frac{5a}{6} + \frac{1}{6}}{6a^2 + 5a + 1} \cdot \frac{6a + 6}{1 + \frac{1}{a}} = ?$$

A) $6a$ B) $\frac{6}{a}$ C) 6 D) a E) $\frac{1}{a}$

8. $$\frac{(x + y)^2 + 4(x + y) + 3}{x + y + 1} = ?$$

A) $x - y + 3$ B) $x + y - 3$ C) $x + y + 1$ D) $x + y + 3$ E) $x + y - 1$

9. $\dfrac{x^2y^2 + 3xy + 2}{xy + 2} - 1 = ?$

A) $xy + 1$ B) $xy - 1$ C) $xy - 2$ D) xy E) $-xy$

10. $\dfrac{a^2b^2 + ab - 2}{a^2b^2 + 2ab - 3} = \dfrac{ab + 1}{ab - 1}$

$\Rightarrow$ **ab = ?**

A) $\dfrac{5}{3}$ B) $\dfrac{3}{5}$ C) 0 D) $-\dfrac{3}{5}$ E) $-\dfrac{5}{3}$

11. $\dfrac{28m^2 + 5m - 12}{4m^2 - 17m - 15} = ?$

A) $\dfrac{7m - 5}{m - 4}$ B) $\dfrac{7m - 4}{m - 5}$ C) $\dfrac{7m + 4}{m + 5}$ D) $\dfrac{7m + 4}{m - 4}$ E) $\dfrac{7m - 4}{m - 3}$

12. $\dfrac{(x + y + z)^2 + (x + y + z) - 2}{(x + y + z)^2 - 2(x + y + z) + 1} - \dfrac{3}{x + y + z - 1} = ?$

A) -1 B) 0 C) 1 D) 2 E) 3

13. $\dfrac{(m - a)^2 - 8(m - a) + 15}{(m - a)^2 - 2(m - a) - 15} = ?$

A) $\dfrac{m - a}{m + a}$ B) $\dfrac{m - a - 3}{m + a - 3}$ C) $\dfrac{m - a - 3}{m - a + 3}$ D) $\dfrac{m - a - 2}{m - a - 5}$ E) $\dfrac{m + a + 3}{m + a - 3}$

14. $\dfrac{5\Delta^2 + 4\Delta - 9}{2\Delta^2 - 4\Delta + 2} = ?$

A) $\dfrac{5\Delta + 9}{2\Delta - 2}$ B) $\dfrac{5\Delta - 9}{\Delta - 2}$ C) $\dfrac{5\Delta - 9}{\Delta + 2}$ D) $\dfrac{\Delta - 1}{2\Delta + 1}$ E) $\dfrac{\Delta - 1}{\Delta + 1}$

15. $\dfrac{(x - y + z)^2 + 3(x - y + z)}{(x - y + z)^2 + 5(x - y + z) + 6} = ?$

A) $\dfrac{x - y + z}{x - y + z}$ B) $\dfrac{x - y + z}{x - y + z + 2}$ C) $\dfrac{x - y + z}{x - y - z}$ D) $\dfrac{x + z + 1}{x - y + z}$ E) $\dfrac{x + y + z + 2}{x + y + z + 1}$

16. $\dfrac{\sqrt{a^2} + 3\sqrt{a} + 2}{\sqrt{a^2} - \sqrt{a} - 2} = 2$

$\Rightarrow$ **a = ?**

A) 6 B) 16 C) 25 D) 36 E) 39

1-A 2-E 3-E 4-A 5-A 6-B 7-D 8-D 9-D 10-E 11-B 12-C 13-C 14-A 15-B 16-D

1. $\dfrac{x^2 - xy - 6y^2}{x^2 - 2xy - 3y^2} = ?$

A) $\dfrac{x-y}{x+y}$ B) $\dfrac{x-2y}{x-y}$ C) $\dfrac{x-2y}{x+y}$ D) $\dfrac{x+2y}{x+y}$ E) $\dfrac{x+2y}{x-y}$

2. $\dfrac{x^2 + 2xy - 15y^2}{x^2 - 7xy + 12y^2} = ?$

A) $\dfrac{x+4y}{x-3y}$ B) $\dfrac{x+5y}{x-3y}$ C) $\dfrac{x-3y}{x-4y}$ D) $\dfrac{x+5y}{x+4y}$ E) $\dfrac{x+5y}{x-4y}$

3. $a \neq -2b$

$a^2 - 5ab - 13b^2 = b^2$

$\Rightarrow \dfrac{a}{b} = ?$

A) -7 B) $\dfrac{1}{7}$ C) 2 D) 7 E) 14

4. $m \neq 3n$

$2m^2 - 3mn - 8n^2 = n^2$

$\Rightarrow \dfrac{m}{n} = ?$

A) -3 B) $-\dfrac{3}{2}$ C) $-\dfrac{2}{3}$ D) $\dfrac{2}{3}$ E) $\dfrac{3}{2}$

5. $\dfrac{m^2 + 3mn + 2n^2}{m^2 - 3mn - 4n^2} : \dfrac{1}{3m - 12n} = ?$

A) $m + n$ B) $3m - 6n$ C) $3m + 6n$ D) $m + 2n$ E) $m - 6n$

6. $\dfrac{\dfrac{a-b}{a^2 + 2ab - 3b^2}}{\dfrac{a+b}{a^2 - 2ab - 3b^2}} = 2$

$\Rightarrow \dfrac{b}{a} = ?$

A) -9 B) $-\dfrac{1}{9}$ C) 2 D) $\dfrac{1}{9}$ E) 9

7. $\dfrac{\dfrac{2a^2 + ab - b^2}{2a - b}}{\dfrac{2x^2 - xy - y^2}{2x + y}} = ?$

A) $\dfrac{a+b}{x+2y}$ B) $\dfrac{a-b}{2x+y}$ C) $\dfrac{2a-b}{2x+y}$ D) $\dfrac{a-b}{x-y}$ E) $\dfrac{a+b}{x-y}$

8. $\dfrac{m(m-2) + (m+1).(m-2) - m + 2}{2m} = ?$

A) $m - 2$ B) m C) $m + 2$ D) $2m$ E) $2m + 2$

9. $\dfrac{(a+2)^2+(a+2)-2}{(a+3)^2-3(a+3)-4}=?$

A) $\dfrac{a-1}{a+1}$ B) $\dfrac{a+1}{a-1}$ C) $\dfrac{a+4}{a-1}$ D) $\dfrac{a-4}{a+1}$ E) $\dfrac{a+1}{a-4}$

10. $\dfrac{(a+3)^3+3(a+3)^2+2(a+3)}{a^2+9a+20}=?$

A) $a+3$ B) $a+2$ C) $a+1$ D) $\dfrac{a+1}{a}$ E) a^2+3a

11. $\dfrac{x^2+x(a+1)+a}{x^2+3x+2}=\dfrac{3x+1}{3x+6}$

$\Rightarrow$ $a=?$

A) 4 B) 3 C) $\dfrac{1}{3}$ D) $\dfrac{1}{6}$ E) $\dfrac{1}{18}$

12. $\dfrac{2x^2+x(a-2)-a}{x^2-6x+5}=\dfrac{2x-4}{x-5}$

$\Rightarrow$ $a=?$

A) -6 B) -4 C) 1 D) 2 E) 5

13. $\dfrac{(x^2-3x+2)(x^2-7x+12)}{(x^2-x)(x^2-5x+6)}=?$

A) $1+\dfrac{4}{x}$ B) $1-\dfrac{4}{x}$ C) $x+\dfrac{1}{4}$ D) $x-\dfrac{1}{4}$ E) $1-\dfrac{x}{4}$

14. $\dfrac{\dfrac{1}{x^2}-\dfrac{1}{x}-2}{\dfrac{1}{x^2}+\dfrac{1}{x}}=?$

A) $1+\dfrac{x}{2}$ B) $1-\dfrac{x}{2}$ C) $1+\dfrac{2}{x}$ D) $1-2x$ E) $1+2x$

15. $\dfrac{\dfrac{1}{m^2}-\dfrac{4}{mn}+\dfrac{3}{n^2}}{\dfrac{n^2-4mn+3m^2}{mn}}=?$

A) $\dfrac{1}{mn}$ B) $-\dfrac{1}{mn}$ C) $-mn$ D) mn E) $n-3m$

16. $\dfrac{2a^3+3a^2-5a}{2a^4+7a^3+5a^2}=?$

A) $\dfrac{a^2+a}{a-1}$ B) $\dfrac{2a+5}{2a+3}$ C) $\dfrac{a^2-a}{a+1}$ D) $\dfrac{a+2}{a^2+a}$ E) $\dfrac{a-1}{a^2+a}$

1-D 2-E 3-D 4-B 5-C 6-B 7-E 8-A 9-B 10-A 11-C 12-B 13-B 14-D 15-A 16-E

1. $\dfrac{a^2 - 4b^2}{a + 2b} = ?$

A) $2a - b$ B) $2a + b$ C) $a + b$ D) $a + 2b$ E) $a - 2b$

2. $\dfrac{a^2 - 9}{a^2 + 5a + 6} = ?$

A) $\dfrac{a+3}{a+2}$ B) $\dfrac{a-3}{a+2}$ C) $\dfrac{a-3}{a-2}$ D) $\dfrac{a-3}{a+1}$ E) $\dfrac{a+3}{a-2}$

3. $\dfrac{x^2 - 5x - 24}{x^2 - 64} + \dfrac{5}{x + 8} = ?$

A) $\dfrac{x+8}{x+3}$ B) $\dfrac{x+3}{x+8}$ C) 1 D) $\dfrac{x-3}{x+8}$ E) -1

4. $x, y \in Z^+$

$x^2 - y^2 = 31$

$\Rightarrow$ $x = ?$

A) 11 B) 12 C) 13 D) 15 E) 16

5. $\dfrac{a - 1}{\sqrt{a} + 1} + 1 = ?$

A) $\sqrt{a}$ B) a C) 1 D) $-\sqrt{a}$ E) -1

6. $\dfrac{(a + b)^2 - (a - b)^2}{(2a - 3b)^2 - (2a + 3b)^2} = ?$

A) $-\dfrac{1}{32}$ B) $-\dfrac{1}{24}$ C) $-\dfrac{1}{6}$ D) $\dfrac{1}{6}$ E) 6

7. $x, y \in Z^+$

$x^2 - y^2 = -11$

$\Rightarrow$ $2xy = ?$

A) 60 B) 30 C) -11 D) -30 E) -60

8. $(\sqrt{a} - 1).(a + 1) = 3$

$\Rightarrow$ $\dfrac{a^2 - 4}{\sqrt{a}} = ?$

A) $\sqrt{3}$ B) 3 C) 4 D) 9 E) 16

9. $\dfrac{19^2 - 17^2}{48^2 - 24^2} = ?$

A) 24 B) $\dfrac{1}{12}$ C) $\dfrac{1}{24}$ D) $-\dfrac{1}{12}$ E) -12

10. $\dfrac{14^2 - 7^2}{21^2 - 14^2} = ?$

A) $\dfrac{3}{2}$ B) $\dfrac{3}{5}$ C) $\dfrac{1}{3}$ D) $\dfrac{1}{6}$ E) $-\dfrac{2}{3}$

11. $\dfrac{4x^2 - 9y^2}{2x^2 - xy - 3y^2} \cdot \dfrac{x^2 - y^2}{2x^2 + xy - 3y^2} = ?$

A) 1 B) 2 C) $\dfrac{5}{2}$ D) 3 E) $\dfrac{7}{2}$

12. $\dfrac{(3m - 1)^2 - (m + 2)^2}{4m^2 - 9} = ?$

A) $\dfrac{4m - 1}{2m - 3}$ B) $\dfrac{4m - 1}{2m + 3}$ C) $\dfrac{2m + 3}{4m + 1}$ D) $\dfrac{4m + 1}{2m + 3}$ E) $\dfrac{4m + 1}{2m - 3}$

13. $\dfrac{(a - 2b)^2 - (a + 3b)^2}{(2a + 5b)^2 - (2a + b)^2} = ?$

A) $\dfrac{2a + b}{4a + 6b}$ B) $\dfrac{a + 3b}{2a + b}$ C) $\dfrac{-10a - 5b}{16a + 24b}$ D) $-\dfrac{5}{8}$ E) $-\dfrac{5}{16}$

14. $\dfrac{(a + b + 1)^2 - (a + b - 1)^2}{(a - b + 1)^2 - (a - b - 1)^2} = ?$

A) $\dfrac{a + b}{a - b}$ B) $\dfrac{2a + b}{2a - b}$ C) $\dfrac{a - b}{a + b}$ D) $\dfrac{2a - 2b}{a + 3b}$ E) $\dfrac{a + b + 1}{a - b - 1}$

15. $(2 + 1).(4 + 1).(16 + 1) = 2^a - 1$

$\Rightarrow$ a = ?

A) 9 B) 8 C) 7 D) 6 E) 5

16. $(\sqrt{5} + 1).(5 + 1).(5^2 + 1) = \dfrac{m}{\sqrt{5} - 1}$

$\Rightarrow$ m = ?

A) 124 B) 126 C) 623 D) 624 E) 625

1-E 2-B 3-C 4-E 5-A 6-C 7-A 8-B 9-C 10-B 11-A 12-D 13-C 14-A 15-B 16-D

TEST 6

1. $x^2 + 4x + 4 = ?$

A) $x + 2$ B) $(x + 2)^2$ C) $x - 2$ D) $(x - 2)^2$ E) $x^2 + 4$

2. $4x^2 + 12xy + 9y^2 = ?$

A) $(2x + 3y)^2$ B) $(2x - 3y)^2$ C) $(3x - 2y)^2$ D) $(3x + 2y)^2$ E) $(x - 2y)^2$

3. $a^2 + 8 + \frac{16}{a^2} = ?$

A) $\left(a + \frac{4}{a}\right)^2$ B) $\left(a - \frac{4}{a}\right)^2$ C) $\left(a^2 + \frac{16}{a}\right)^2$ D) $\left(a + \frac{16}{a}\right)^2$ E) $\left(a - \frac{8}{a}\right)^2$

4. $x^2 + 2 + \frac{1}{x^2} = ?$

A) $\left(x - \frac{1}{x}\right)^2$ B) $x - \frac{1}{x}$ C) $\left(x + \frac{1}{x}\right)^2$ D) $x + \frac{1}{x}$ E) $x^2 + \frac{1}{2x}$

5. $x - y = 2$

$x \cdot y = 3$

$\Rightarrow x^2 + y^2 = ?$

A) 10 B) 7 C) 6 D) 4 E) 3

6. $a + b = 5$

$a \cdot b = 5$

$\Rightarrow a^2 + b^2 = ?$

A) 35 B) 30 C) 25 D) 20 E) 15

7. $a^2 + b^2 = 40$

$a \cdot b = 2$

$\Rightarrow (a - b)_{max} = ?$

A) -6 B) 4 C) 5 D) 6 E) 7

8. $a^2 + b^2 = 7$

$a \cdot b = -3$

$\Rightarrow (a + b)_{min} = ?$

A) 3 B) 2 C) 1 D) 0 E) -1

9. $x + \frac{1}{x} = 7$

$\Rightarrow \left(x - \frac{1}{x}\right)_{max} = ?$

A) $3\sqrt{5}$ B) $4\sqrt{5}$ C) 9 D) $\sqrt{84}$ E) $3\sqrt{10}$

10. $a + \frac{1}{a} = 12$

$\Rightarrow a^2 + \frac{1}{a^2} = ?$

A) 150 B) 149 C) 149 D) 146 E) 142

11. $a^2 + b^2 - 6b - 4a + 13 = 0$

$\Rightarrow a + b = ?$

A) 6 B) 5 C) 2 D) – 5 E) – 6

12. $a^2 + 14a + b^2 + 49 = 0$

$\Rightarrow a \,.\, b = ?$

A) – 14 B) – 7 C) 0 D) 7 E) 14

13. $x + \frac{1}{2x} = 6$

$\Rightarrow 4x^2 + \frac{1}{x^2} = ?$

A) 140 B) 142 C) 144 D) 146 E) 148

14. $3x + \frac{2}{x} = 4$

$\Rightarrow x^2 + \frac{4}{9x^2} = ?$

A) $\frac{1}{9}$ B) $\frac{4}{9}$ C) $\frac{9}{4}$ D) 2 E) 4

15. $a^2 + 4a + 4 = -b^2 + 4b - 4$

$\Rightarrow a - b = ?$

A) – 4 B) – 2 C) 0 D) 2 E) 4

16. $a^2 - 8a + b^2 - 6b + 18$

ifadesinin <u>en küçük</u> değeri kaçtır?

What is <u>the smallest</u> value of the expression?

A) 7 B) 6 C) – 6 D) – 7 E) – 8

1-B 2-A 3-A 4-C 5-A 6-E 7-D 8-E 9-A 10-E 11-B 12-C 13-A 14-B 15-A 16-D

1. $a + b + c = 11$

$a^2 + b^2 + c^2 = 81$

$\Rightarrow$ **$ab + ac + bc = ?$**

A) 19 B) 20 C) 21 D) 31 E) 41

2. $a - b - c = 10$

$2ab + 2ac - 2bc = 22$

$\Rightarrow$ **$a^2 + b^2 + c^2 = ?$**

A) 78 B) 88 C) 122 D) 152 E) 162

3. $a^2 + b^2 + c^2 = 118$

$-ab + ac + bc = 9$

$\Rightarrow$ **$(-a - b + c)^2 = ?$**

A) 136 B) 127 C) 118 D) 109 E) 100

4. $a^2 + 2ab = 13$

$b^2 + 2bc = 17$

$c^2 + 2ab = 19$

$\Rightarrow$ **$(a + b + c)^2 = ?$**

A) 49 B) 48 C) 47 D) 46 E) 44

5. $\dfrac{a^3 + 1}{a^2 - a + 1} - 1 = ?$

A) $-a$ B) a C) 0 D) -1 E) 1

6. $\dfrac{a^3 + 8}{a^3 + 27} \cdot \dfrac{a^2 - 3a + 9}{a^2 - 2a + 4} = ?$

A) $\dfrac{a+3}{a-2}$ B) $\dfrac{a-2}{a-3}$ C) $\dfrac{a-2}{a+3}$ D) $\dfrac{a+2}{a+3}$ E) $\dfrac{a+3}{a+2}$

7. $\dfrac{x^2 - \frac{1}{x}}{x - 1} \cdot \dfrac{x + 1}{x^2 + x + 1} = ?$

A) $-\dfrac{1}{x}$ B) $\dfrac{x}{x+1}$ C) $\dfrac{x}{x-1}$ D) $1 + \dfrac{1}{x}$ E) $1 - \dfrac{1}{x}$

8. $a + \dfrac{3}{a} = 4$

$\Rightarrow$ $a^3 + \dfrac{27}{a^3} = ?$

A) 28 B) 30 C) 34 D) 36 E) 40

9. $a + b = 5$

$a \cdot b = 6$

$\Rightarrow$ $a^3 + b^3 = ?$

A) 25 B) 35 C) 40 D) 45 E) 50

10. $\dfrac{(x^3 - y^3) \cdot (x^3 + y^3)}{(x^2 + xy + y^2) \cdot (x^2 - xy + y^2)} + x^2 + y^2 = ?$

A) $2y^2$ B) $2x^2 + 2y^2$ C) $2x^2 - 2y^2$ D) $x^2 - y^2$ E) $2x^2$

11. $(a + b).(a^4 - a^3b + a^2b^2 - ab^3 + b^4) = 242$

$b = -1$

$\Rightarrow$ $a = ?$

A) -3 B) -2 C) -1 D) 3 E) 4

12. $2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 1 = ?$

A) 118 B) 122 C) 124 D) 127 E) 128

13. $\dfrac{x^7 - 1}{x^6 + x^5 + x^4 + x^3 + x + 1} \cdot \dfrac{x^4 + x^3 + x^2 + x + 1}{x^5 - 1} = ?$

A) 1 B) 0 C) -1 D) $x - 1$ E) $x + 1$

14. $(x - 2)(x^4 + 2x^3 + 4x^2 + 8x + 16) = a$

$x = \sqrt[5]{34}$

$\Rightarrow$ $a = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

15. $\dfrac{a^3 + 8}{a^2 + 5a + 6} \cdot \dfrac{a^2 - 9}{a^2 - 3a} = ?$

A) $\dfrac{a^2 + 2a}{a + 3}$ B) $a + \dfrac{2}{a}$ C) $a - 2 + \dfrac{4}{a}$ D) $a^2 + \dfrac{4}{a}$ E) $\dfrac{a^2 + 2a + 4}{a}$

16. $\dfrac{a^2 - \dfrac{125}{a}}{a^2 - 5a} : \left(a + 5 + \dfrac{25}{a}\right) = ?$

A) $a + 5$ B) $a - 5$ C) $\dfrac{1}{a}$ D) $\dfrac{1}{a - 5}$ E) $\dfrac{1}{a + 5}$

1-B 2-C 3-E 4-A 5-B 6-D 7-D 8-A 9-B 10-E 11-D 12-D 13-A 14-A 15-C 16-C

1. $\dfrac{x^3 - 3x^2y + 3xy^2 - y^3}{x^2 - 2xy + y^2} = ?$

A) $x - y$ B) $x + y$ C) $x^3 + y^3$ D) $x^2 - y^2$ E) $x^2 + y^2$

2. $a^3 + (3ab^2) = 14$

$b^3 + 3a^2b = 13$

$\Rightarrow (a + b) = ?$

A) 27 B) 3 C) – 3 D) – 13 E) – 30

3. $x^5 + 5x^4y + 10x^3y^2 + 10x^2y^3 + 5xy^4 + y^5 = -32$

$x = -4$

$\Rightarrow y = ?$

A) – 2 B) 2 C) 3 D) 5 E) 7

4. $\dfrac{(a + b)^3 - (a - b)^3}{3a^2 + b^2} = ?$

A) 3ab B) a C) 2b D) a + b E) a – b

5. $x - y = 5$

$z + y = 5$

$\Rightarrow x^2 + z^2 - 2y^2 = ?$

A) 25 B) 45 C) 50 D) 55 E) 65

6. $x, y \in R$

$x \,.\, y < 0$

$2x^2 + 5xy - 12y^2 = 0$

$\Rightarrow \dfrac{x}{y} = ?$

A) $-\dfrac{1}{4}$ B) $-\dfrac{2}{3}$ C) $-\dfrac{3}{2}$ D) – 3 E) – 4

7. $\sqrt{2016 \,.\, 2024 + 16} = ?$

A) 2020 B) 2016 C) 2012 D) 2008 E) 2004

8. $\sqrt{3 \,.\, 5 \,.\, 17 + 1} = ?$

A) 4 B) 9 C) 15 D) 16 E) 17

9. $x \in R$,

$A = x^2 + 4x + 13$

$\Rightarrow A_{min} = ?$

A) 10 B) 9 C) 8 D) 6 E) 4

10. $x \in R$,

$A = -x^2 - 6x - 10$

$\Rightarrow A_{max} = ?$

A) 1 B) 0 C) – 1 D) – 2 E) – 3

11. $x \in R$,

$A = x^2 + x + 2$

$\Rightarrow A_{min} = ?$

A) 4 B) 3 C) 2 D) $\frac{7}{4}$ E) $\frac{4}{7}$

12. $x^2 - 3x = -1$

$\Rightarrow x^2 + \frac{1}{x^2} = ?$

A) 15 B) 13 C) 11 D) 9 E) 7

13. $x^2 + 2 = -1 + 4x$

$\Rightarrow x^2 + \frac{9}{x^2} = ?$

A) 6 B) 7 C) 8 D) 10 E) 22

14. $x^2 + 5x + 1 = 0$

$\Rightarrow \left(x + \frac{1}{x}\right)^2 = ?$

A) 15 B) 25 C) 29 D) 31 E) 35

15. $a + \frac{4}{a+3} = 5$

$\Rightarrow (a+3)^2 + \frac{16}{(a+3)^2} = ?$

A) 56 B) 60 C) 64 D) 68 E) 72

16. $a + 5 + \frac{2}{a+3} = 5$

$\Rightarrow (a+3)^2 + \frac{4}{(a+3)^2} = ?$

A) 12 B) 11 C) 9 D) 6 E) 5

1-A 2-B 3-B 4-C 5-C 6-E 7-A 8-D 9-B 10-C 11-D 12-E 13-D 14-B 15-A 16-E

1. $x \neq 0$

$x^2 + 3x - 2 = 0$

$\Rightarrow x^2 + \frac{6}{x} = ?$

A) 7 B) 8 C) 9 D) 10 E) 11

2. $a^2 - a + 1 = 0$

$\Rightarrow (a-3)^2 + (1-a)^2 = ?$

A) $8a + 10$ B) $-6a + 8$ C) $a + 8$ D) $a - 1$ E) $a - 10$

3. $a^2 + a + 1 = 0$

$\Rightarrow a^{102} = ?$

A) 1 B) -1 C) $a + 1$ D) $a - 1$ E) $a^2 + a + 1$

4. $a^2 - a - 1 = 0$

$\Rightarrow a^5 = ?$

A) $3a - 5$ B) $5a - 3$ C) $5a + 3$ D) $3a + 3$ E) $5a - 5$

5. $1 > x > 0,$

$x + \frac{1}{x} = 4$

$\Rightarrow x - \frac{1}{x} = ?$

A) $-\sqrt{12}$ B) -3 C) -2 D) 3 E) $\sqrt{12}$

6. $x^2 + y^2 + z^2 - 4x - 6y - 8z + 29 = 0$

$\Rightarrow x \cdot y \cdot z = ?$

A) 6 B) 9 C) 12 D) 18 E) 24

7. $(3^a + 1).(9^a + 1).(81^a + 1) = \frac{3^8 - 1}{3^a - 1}$

$\Rightarrow a = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

8. $x = 2000$

$y = 1333$

$\Rightarrow 16x^4 - 24x^3y + 36x^2y^2 - 54xy^3 + 81y^4 = ?$

A) 5 B) 4 C) 2 D) 1 E) 0

9. $\dfrac{ay^2 - 9a - 2y^2 + 18}{ay - 2y - 3a + 6} + \dfrac{ay - 2y - 3a + 6}{a - 2} = ?$

A) $-2y$ B) $2y$ C) 6 D) $a + 3y$ E) -6

10. $\left(2 - \dfrac{2x}{x + y}\right) : \left(3 - \dfrac{3y}{x + y}\right) = ?$

A) $\dfrac{x}{y}$ B) $\dfrac{3}{2}$ C) $\dfrac{2}{3}$ D) $\dfrac{2y}{3x}$ E) $\dfrac{3x}{2y}$

11. $a - 3b = 4$

$\Rightarrow a^2 + 2a + 9b^2 - 6ab - 6b = ?$

A) 24 B) 28 C) 30 D) 32 E) 34

12. $\left(\dfrac{1 + m}{1 - m} - \dfrac{1 - m}{1 + m}\right) . \left(\dfrac{1}{m} - m\right) = ?$

A) $1 - m^2$ B) $\dfrac{4}{m}$ C) $\dfrac{m}{4}$ D) $\dfrac{1}{4}$ E) 4

13. $a > b$

$a^2 + b^2 = \sqrt{7}$

$a . b = 1$

$\Rightarrow a^4 - b^4 = ?$

A) $3\sqrt{7}$ B) $\sqrt{21}$ C) $2\sqrt{5}$ D) 4 E) 3

14. $x, y \in Z$

$3x^3 - 7xy^2 = 2a$

$7y^3 - 3yx^2 = 5a$

$\Rightarrow \dfrac{x + 5y}{y - 3x} = ?$

A) $-\dfrac{23}{11}$ B) $-\dfrac{11}{23}$ C) $\dfrac{23}{11}$ D) $\dfrac{24}{13}$ E) $\dfrac{27}{17}$

15. $(2^a - 1)(2^a + 1)(2^{2a} + 1)(2^{4a} + 1)(2^{8a} + 1) + 1 = 2^{32}$

$\Rightarrow a = ?$

A) 2 B) $\dfrac{5}{2}$ C) 3 D) $\dfrac{7}{2}$ E) 4

16. $\dfrac{3^{5x} - 3^x}{3^{2x} + 1} = 2 . 3^x$

$\Rightarrow x = ?$

A) $\dfrac{5}{2}$ B) 2 C) $\dfrac{3}{2}$ D) 1 E) $\dfrac{1}{2}$

1-E 2-B 3-A 4-C 5-A 6-E 7-D 8-D 9-B 10-D 11-A 12-E 13-B 14-C 15-A 16-E

1. $A = 103$

$\Rightarrow$ $A^2 - 6A = ?$

A) $100^2 - 3^2$ B) $100^2 + 3^2$ C) $103^2 + 3^2$ D) $106^2 + 1$ E) $106^2 + 3^2$

2. $a^2 + 3a + 1 = 0$

$\Rightarrow$ $\dfrac{a^6 + a^2}{a^4} = ?$

A) 9 B) 7 C) 5 D) 3 E) -7

3. $\dfrac{2^{\frac{8}{3}} - 1}{\left(2^{\frac{4}{3}} + 1\right)\left(2^{\frac{2}{3}} + 1\right)} = a - 1$

$\Rightarrow$ $a^3 = ?$

A) $2^{\frac{8}{3}}$ B) $2^{\frac{3}{2}}$ C) $2^{\frac{1}{2}}$ D) 2 E) 4

4. $\dfrac{x^2 + ax + b}{x^2 - x - 6} = \dfrac{x - 4}{x + 2}$

$\Rightarrow$ $a + b = ?$

A) 19 B) 12 C) 7 D) 5 E) -5

5. $\dfrac{x - y}{x\sqrt{y} - y\sqrt{x}} = \dfrac{4}{\sqrt{y}}$

$\Rightarrow$ $\dfrac{x}{y} = ?$

A) $\dfrac{1}{2}$ B) $\dfrac{1}{3}$ C) $\dfrac{1}{9}$ D) $\dfrac{1}{12}$ E) $\dfrac{1}{16}$

6. $a, b, c \in R,\ a - b - c = bc$

$a \neq 0,\ b \neq 0,\ c \neq 0,$

$\Rightarrow$ $\dfrac{a^2 - ab - ac + bc}{abc} = ?$

A) $\dfrac{a}{a-1}$ B) $\dfrac{a-1}{a}$ C) $\dfrac{a+1}{a}$ D) $\dfrac{a}{a+1}$ E) $\dfrac{a-1}{a+1}$

7. $a^3 + 4 = 0$

$\Rightarrow$ $\dfrac{-3}{a^2 - a + 1} = ?$

A) $3a + 1$ B) $a^2 + 1$ C) $a^2 - 1$ D) $a + 1$ E) $a - 1$

8. $\dfrac{a^2}{b} + \dfrac{b^2}{a} = 2(a + b)$

$\Rightarrow$ $\dfrac{a}{b} + \dfrac{b}{a} = ?$

A) $\dfrac{1}{3}$ B) $\dfrac{1}{2}$ C) 1 D) 2 E) 3

9. $x + 1 + \frac{1}{x-1} = \frac{1}{x}$

$\Rightarrow$ $(x^3 + 1) = ?$

A) x B) $-x$ C) $-x+1$ D) x^2+x+1 E) x^2-x+1

10. $f(x) = \frac{x^4 + x^3 + x + 1}{x^2 - x + 1}$

$\Rightarrow$ $f(\sqrt[12]{3} - 1) = ?$

A) $\sqrt[12]{3}$ B) $\sqrt[6]{3}$ C) $\sqrt[4]{3}$ D) $\sqrt[4]{6}$ E) $\sqrt{3}$

11. $a = \frac{1}{b-3}$

$\Rightarrow$ $b + ab - 3a - \frac{1}{a} + 4 = ?$

A) 0 B) 3 C) 4 D) 7 E) 8

12. $\frac{5^{2a} - 2 \cdot 5^a \cdot 7^b + 7^{2b}}{5^{2a} - 7^{2b}} + \frac{2 \cdot 7^b}{5^a + 7^b} = ?$

A) $\frac{7^a + 5^b}{5^a}$ B) 1 C) $\frac{5^a}{7^a + 5^b}$ D) $\frac{5^a - 7^b}{5^a + 7^b}$ E) $\frac{1}{5^a}$

13. $\frac{5^{3x} - 5^{-3x}}{5^{2x} + 5^{-2x} + 1} : \frac{5^x - 5^{-x}}{5^x + 5^{-x}} = ?$

A) 5^x B) $5^x - 5^{-x}$ C) $5^x + 5^{-x}$ D) $5^{2x} - 5^x$ E) $5^{2x} + 5^x$

14. $\left(x^2 - \frac{1}{x^2}\right) \cdot \left(\frac{x}{5x-7}\right) = \frac{x^2+1}{x}$

$\Rightarrow$ $(x)_{max} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

15. $\frac{A}{x-4} + \frac{B}{x-3} = \frac{2x-4}{x^2 - 7x + 12}$

$\Rightarrow$ $\frac{A}{B} = ?$

A) 2 B) $\frac{1}{2}$ C) 1 D) $-\frac{1}{2}$ E) -2

16. $2a + 3b = 0$

$4a^2 - 12ab + 9b^2 - 8a + 12b + 4 = 0$

$\Rightarrow$ $a = ?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{5}$

1-A 2-B 3-E 4-D 5-C 6-C 7-D 8-E 9-A 10-B 11-E 12-B 13-C 14-D 15-E 16-B

ÜNİTE 7

Unit 7

Basit Eşitsizlik / Simple İnequality

TEST 1

1. $x \in Z$

$$x + 2(x - 3) + 4 > x - 7$$

$\Rightarrow$ $(x)_{min} = ?$

A) -2 B) -1 C) 0 D) 1 E) 2

2. $x \in Z$

$$x + 2x + 3x - 11 < x$$

$\Rightarrow$ $(x)_{max} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $x \in Z$

$$2(-x + 1) + 3(x - 2) > 4x - 11$$

$\Rightarrow$ $(x)_{max} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

4. $x \in Z$

$$\frac{x}{2} - x + 4 > 0$$

$\Rightarrow$ $(x)_{max} = ?$

A) 11 B) 10 C) 9 D) 8 E) 7

5. $x \in Z$

$$3x + \frac{x}{2} > \frac{x}{3} - 4$$

$\Rightarrow$ $(x)_{min} = ?$

A) -4 B) -3 C) -2 D) -1 E) 0

6. $x \in Z$

$$\frac{x+1}{2} + \frac{x-2}{3} < 0$$

$\Rightarrow$ $(x)_{max} = ?$

A) -4 B) -3 C) -2 D) -1 E) 0

7. $$\frac{x-2}{7} > \frac{x+1}{2}$$

$\Rightarrow$ **S.S. = ?**

A) $\left(0, \frac{11}{5}\right)$ B) $\left(-\frac{11}{5}, \frac{11}{5}\right)$ C) $\left(-\infty, -\frac{11}{5}\right)$ D) $\left(\frac{1}{5}, \frac{11}{5}\right)$ E) $\left(-\infty, \frac{11}{5}\right)$

8. $$x + \frac{4}{3} > 2x - \frac{1}{3}$$

$\Rightarrow$ **S.S. = ?**

A) $\left(-\infty, \frac{5}{3}\right)$ B) $\left(-\infty, -\frac{5}{3}\right)$ C) $(-\infty, 1)$ D) $(1, \infty)$ E) $\left(\frac{5}{3}, \infty\right)$

9. $x - 2(x - 3) > \frac{x}{4}$

$\Rightarrow$ **S.S. = ?**

A) $\left(-\frac{24}{5}, \frac{24}{5}\right)$ B) $\left(-\infty, \frac{24}{5}\right)$ C) $\left(-\frac{24}{5}, \infty\right)$

D) $\left(\frac{5}{24}, \infty\right)$ E) $\left(-\frac{5}{24}, \frac{5}{24}\right)$

10. $\frac{4}{x} > 2$

$\Rightarrow$ **S.S. = ?**

A) $(-2, \infty)$ B) $(-\infty, -2)$ C) $(0, 2)$

D) $(2, \infty)$ E) $(-2, 2)$

11. $\frac{3}{x+2} > \frac{4}{x+7}$

$\Rightarrow$ **S.S. = ?**

A) $(-\infty, 13) - [-7, -2]$ B) $(-\infty, 29)$

C) $(-13, 13)$ D) $(-29, 29)$

E) $(-29, 29) - \{-7, -2\}$

12. $x + a - 3x > \frac{x}{4} \Rightarrow S.S. = \left(-\infty, \frac{8}{9}\right)$

$\Rightarrow$ **a = ?**

A) 2 B) 1 C) 0 D) – 2 E) – 3

13. $x \in Z$

$3(x - 7) \geq a + 5$

$(x)_{min} = 9$

$\Rightarrow$ **a = ?**

A) – 1 B) 1 C) 3 D) 4 E) 5

14. $5 > 2x - 1 > -3$

$\Rightarrow$ **S.S. = ?**

A) $(-1, 1)$ B) $(-1, 3)$ C) $(-3, -1)$

D) $[-1, 1]$ E) $[-1, 3)$

15. $4 > x > 2$

$\Rightarrow$ $(5x + 4)_{max}$ **= ?**

A) 19 B) 20 C) 21 D) 22 E) 23

16. $x \in Z$

$11 > 2x + 1 > 3$

$\Rightarrow$ Σx **= ?**

A) 17 B) 16 C) 15 D) 10 E) 9

1-A 2-B 3-C 4-E 5-D 6-E 7-C 8-A 9-B 10-C 11-A 12-A 13-B 14-B 15-E 16-E

1. $4 < \frac{x+1}{2} \leq 5$

$\Rightarrow$ **S.S. = ?**

A) $(7, 9]$ B) $(7, 9)$ C) $(-7, 9]$ D) $[-7, 9]$ E) $[7, 9]$

2. $-7 \leq \frac{2x-3}{5} \leq 1$

$\Rightarrow$ **S.S. = ?**

A) $[-4, 16]$ B) $[-16, -4]$ C) $[-16, 4]$ D) $[4, 16]$ E) $(-16, 4)$

3. $x - 4 < 2x < x + 5$

$\Rightarrow$ **S.S. = ?**

A) $(-4, 4)$ B) $(4, 5)$ C) $(-4, 5)$ D) $(-5, 4)$ E) $(-5, 5)$

4. $x \in Z$

$3x + 4 < 16$

$5 < 2x - 1$

$\Rightarrow$ **S.S. = ?**

A) $(-3, 4)$ B) $(-3, 5)$ C) $(-4, 3)$ D) $(3, 4)$ E) $(-3, -2)$

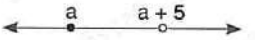
5. $x + 3 < \frac{x+1}{3}$

$-2(x + 10) < \frac{x-8}{4}$

$\Rightarrow$ **S.S. = ?**

A) $(4, 8)$ B) $(-4, 8)$ C) $(-8, 4)$ D) $[4, 8]$ E) $(-8, -4)$

6. $x \in [a, a+5]$



$2x \in [2, 12)$

$\Rightarrow$ **a = ?**

A) 6 B) 5 C) 3 D) 2 E) 1

7. $4(x + 1) > -x + 9$

$x - 3 < -2x + 4$

$\Rightarrow$ **S.S. = ?**

A) $\left(1, \frac{7}{3}\right)$ B) $(1, 2)$ C) $\left(2, \frac{7}{3}\right)$ D) $\left(1, \frac{8}{3}\right)$ E) $\left(2, \frac{8}{3}\right)$

8. $\frac{1}{x} > \frac{2}{x+1}$

$-x < 4$

$\Rightarrow$ **S.S. = ?**

A) $(2, 4)$ B) $(-4, 1) - \{-1, 0\}$ C) $(-4, 1)$ D) $(1, 4)$ E) $(-1, 4) - \{-1, 0\}$

9. $x \in R$

$4 < x < 6$

$\Rightarrow$ **?** $< x^2 <$ **?**

A) (16, 36) B) (0, 36) C) (0, 16) D) (9, 25) E) (9, 16)

10. $x \in R$

$-4 < x \leq 2$

$\Rightarrow$ **?** $< x^2 <$ **?**

A) $[0, 16]$ B) $[0, 16)$ C) $[4, 16]$ D) $[4, 16)$ E) $[0, 4]$

11. $x \in R$

$-7 \leq x < -2$

$\Rightarrow$ **?** $< x^2 <$ **?**

A) $(-4, 49]$ B) $(-49, -4)$ C) $[4, 49]$ D) $(4, 49]$ E) $(0, 49]$

12. $x \in Z$

$-11 \leq x < 3$

$\Rightarrow$ $(x^2)_{max} + (x^2)_{min} =$ **?**

A) 121 B) 130 C) 131 D) 132 E) 134

13. $x, y \in R$

$3 < x < 5$

$4 < y < 6$

$\Rightarrow$ **?** $< x \cdot y <$ **?**

A) (18, 20) B) (12, 30) C) (15, 24) D) (25, 36) E) (16, 25)

14. $x, y \in R$

$-1 < x \leq 4$

$-2 < y \leq 3$

$\Rightarrow$ **?** $< x \cdot y <$ **?**

A) $(-3, 13]$ B) $[-3, -8]$ C) $[-12, 12]$ D) $(-8, 12]$ E) $[2, 12]$

15. $-4 < x < 3$

$\Rightarrow$ **?** $< x^3 <$ **?**

A) (– 3, 16) B) (– 64, – 27) C) (27, 64) D) (9, 16) E) (– 64, 27)

16. $x \in Z$

$-\frac{7}{2} \leq x \leq -\frac{3}{2}$

$\Rightarrow$ $\max(x^2) =$ **?**

A) 1 B) 4 C) 9 D) 16 E) $\frac{49}{4}$

1-A 2-C 3-C 4-D 5-E 6-E 7-A 8-B 9-A 10-B 11-D 12-A 13-B 14-D 15-E 16-C

1. $x, y \in Z$

$-1 < x < 4$

$-2 < y < 5$

$\Rightarrow$ **max(x + y) = ?**

A) 9 B) 8 C) 7 D) 6 E) 5

2. $x, y \in Z$

$-4 < x < 5$

$-3 < y < 6$

$\Rightarrow$ **min(x − y) = ?**

A) −7 B) −8 C) −9 D) −10 E) −11

3. $x, y \in R$, $(x + y) \in Z$

$1 < x < 5$

$-2 < y < 3$

$\Rightarrow$ **max(x + y) = ?**

A) 11 B) 10 C) 9 D) 8 E) 7

4. $x, y \in R$, $(x - 2y) \in Z$

$-4 < x < 3$

$-1 < y < 2$

$\Rightarrow$ **max(x − 2y) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

5. $a, b \in Z$,

$-4 < a < -1$

$-3 < b < 3$

$\Rightarrow$ **max(2a + 3b) = ?**

A) 2 B) 5 C) 6 D) 7 E) 8

6. $x, y \in Z$,

$-2 < 2x < 8$

$-4 < 2y < 10$

$\Rightarrow$ **min(x + 4y) = ?**

A) −8 B) −7 C) −6 D) −5 E) −4

7. $a, b \in R$, $(2a + 3b) \in Z$

$-4 < a < -1$

$-3 < b < 3$

$\Rightarrow$ **max(2a + 3b) = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

8. $a, b \in R$, $(2a + b) \in Z$

$1 < a < 4$

$1 < b < 3$

$\Rightarrow$ **min(2a + b) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

9. $(x^2 + y^2) \in Z$

$-2 < x < 4$

$-3 \leq y < 1$

$\Rightarrow$ **max$(x^2 + y^2)$ = ?**

A) 17 B) 24 C) 25 D) 27 E) 34

10. $(x^2 - y^2) \in Z$

$-3 < x \leq -1$

$4 < y < 6$

$\Rightarrow$ **min$(x^2 - y^2)$ = ?**

A) −34 B) −33 C) −17 D) −10 E) −7

11. $A \in Z$,

$A = x^2 + 4x + 3$

$-2 < x < 1$

$\Rightarrow$ **max(A) = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

12. $B \in Z$,

$B = b^2 - 8b + 10$

$0 < b < 3$

$\Rightarrow$ **min(B) = ?**

A) −6 B) −5 C) −4 D) 9 E) 10

13. $a, b \in Z$,

$18 < a - b < 25$

$\frac{a + b}{b} = 4$

$\Rightarrow$ **max(a + b) = ?**

A) 36 B) 48 C) 50 D) 52 E) 54

14. $a, b \in Z$,

$-14 < 2a + b < 35$

$\frac{a - b}{2} = b$

$\Rightarrow$ **min(a + b) = ?**

A) −7 B) −6 C) −5 D) −4 E) −3

15. $a, b \in Z$, $c \in Z^+$,

$a < b < 0$

$a + 2b + c = -11$

$\Rightarrow$ **min(c) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

16. $a, b, c \in Z^+$, $\left(\frac{b + c}{a}\right) \in Z$

$1 < a \leq 7$

$2 \leq b < 4$

$3 < c < 10$

$\Rightarrow$ **max$\left(\frac{b + c}{a}\right)$ = ?**

A) 9 B) $\frac{17}{2}$ C) 8 D) $\frac{15}{2}$ E) 6

1-C 2-B 3-E 4-A 5-A 6-E 7-A 8-C 9-B 10-A 11-B 12-C 13-B 14-D 15-B 16-E

1. $x < y < 0$

$z = \dfrac{2x + y}{y}$

$\Rightarrow$ **? < z < ?**

A) $(3, \infty)$ B) $(-\infty, 3)$ C) $(-3, 3)$ D) $(\infty, -3)$ E) $(3, 5)$

2. $a < b < 0$

$c = \dfrac{b - 2a}{b}$

$\Rightarrow$ **? < c < ?**

A) $(1, \infty)$ B) $(-\infty, 1)$ C) $(-\infty, -1)$ D) $(-1, \infty)$ E) $(-1, 1)$

3. $a, b, c \in Z$,

$a < 0$

$3b < a$

$a + b + c = -7$

$\Rightarrow$ **min(c) = ?**

A) -1 B) -2 C) -3 D) -4 E) -5

4. $-3 < x + 1 < 4$

$-2 < y - 2 < 4$

$\Rightarrow$ **? < x . y < ?**

A) $(-5, 8)$ B) $(6, 16)$ C) $(18, 24)$ D) $(0, 18)$ E) $(-24, 18)$

5. $m = a^2 - 4$

$-5 < a < 2$

$\Rightarrow$ **? < m < ?**

A) $(-4, 25)$ B) $(0, 25)$ C) $(4, 25)$ D) $(0, 21)$ E) $[-4, 21)$

6. $4 < x + 7 < 5$

$-7 < 2x + 1 < 7$

$\Rightarrow$ **S.S. = ?**

A) $(-4, 3)$ B) $(-3, -2)$ C) $(-4, -2)$ D) $(-3, 3)$ E) $(-3, 4)$

7. **$(x < y < 0) \Rightarrow$ aşağıdakilerden hangisi doğrudur?**

If $(x < y < 0)$, which of the following is true?

A) $x + y > 0$ B) $x . y < 0$ C) $2x - y < 0$ D) $2x - y > 0$ E) $3x + 2y > 0$

8. $x, y, z \in R$

$x . y < 0$

$x . z^2 < 0$

$y . z < 0$

$x - z < 0$

$\Rightarrow$ **? < ? < ?**

A) $z < y < x$ B) $y < z < x$ C) $x < y < z$ D) $y < x < z$ E) $x < z < y$

9. $a, b \in R$

$3 < a < 5$

$-4 < b < 7$

$m < \frac{a+b}{3} < n$

$\Rightarrow$ **(m, n) = ?**

A) $\left(-\frac{1}{3}, 4\right)$ B) $(-1, 12)$ C) $\left(-\frac{1}{2}, 3\right)$

D) $\left(-\frac{1}{3}, 2\right)$ E) $\left(\frac{1}{3}, 4\right)$

10. $a^2 . b^3 . c < 0$

$a^4 . b^4 . c^3 > 0$

$a . b . c < 0$

$\Rightarrow$ **a, b, c = ?, ?, ?**

A) +, +, − B) +, −, + C) +, +, +

D) −, +, + E) −, −, −

11. $0 < a < 1$

Aşağıdakilerden hangisi doğrudur?
Which of the the following is true?

A) $a^2 < a$ B) $a^3 < a^4$ C) $\frac{1}{a} < \frac{1}{a+1}$

D) $-a < -a - 1$ E) $a^{13} < a^{14}$

12. $x \in R$, $(2 - x) \in Z$

$-5 < 3x < 4$

$\Rightarrow$ **$\Sigma(2 - x)$ = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

13. $a, b \in Z$

$3 < a + b < a < 7$

$\Rightarrow$ **Σb = ?**

A) −9 B) −8 C) −7 D) −6 E) −3

14. $a, b \in R$, $(a + b) \in Z$

$4 < a < 15$

$2a = 5b$

$\Rightarrow$ **max(a + b) = ?**

A) 21 B) 20 C) 19 D) 11 E) 10

15. $n \in Z^+$, $x \in R$

$A_n = \left\{x \in R, \frac{2}{n} < x < \frac{4}{n}\right\}$

$\Rightarrow$ **$A_3 \cap A_2$ = ?**

A) $\left(\frac{2}{3}, 4\right)$ B) $(1, 4)$ C) $\left(1, \frac{4}{3}\right)$

D) $\left(\frac{2}{3}, \frac{4}{3}\right)$ E) $(2, 4)$

16. $x, y \in R$,

$0 < x < 2x^2$

$y + 3 = 4x$

$\Rightarrow$ **min(y ∈ Z) = ?**

A) −2 B) −1 C) 0 D) 1 E) 2

1-A 2-C 3-E 4-E 5-E 6-B 7-C 8-E 9-A 10-B 11-A 12-E 13-E 14-B 15-C 16-C

1. $0 < x < y$

$x \cdot z = 3x + 2y$

$\Rightarrow$ **? < z < ?**

A) (1, 5) B) (– 5, 5) C) (5, ∞) D) (– ∞, – 5) E) (– ∞, 5)

2. $a^2 < a$

$\Rightarrow$ **? < 2a + 5 < ?**

A) (5, 7) B) [5, 7] C) (5, 12) D) (7, 12) E) (– 5, 5)

3. $-7 < a < 4$

$\Rightarrow$ **? < a^2 + 4a < ?**

A) [– 4, 32] B) [– 4, 32) C) [– 32, 4] D) [– 32, 4) E) (– 4, 32)

4. $-\frac{1}{4} < x < y < z < \frac{3}{4}$

$(2x + 3y + 4z) \in Z$

$\Rightarrow$ **max(2x + 3y + 4z) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

5. $2 < a < b < c < 10$

$\left(\frac{5}{a} + \frac{6}{b} + \frac{8}{c}\right) \in Z$

$\Rightarrow$ $\left(\frac{5}{a} + \frac{6}{b} + \frac{8}{c}\right)_{max}$ **= ?**

A) 9 B) 10 C) 11 D) 12 E) 15

6. $(x \cdot y) \in Z$

$4 < x^2 < 9$

$0 \le y^2 < 16$

$\Rightarrow$ **max(x . y) = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

7. $x \in Z$

$\left(\frac{3}{5}\right)^{x+7} > \left(\frac{5}{3}\right)^{x+4}$

$\Rightarrow$ **max(x) = ?**

A) –5 B) –6 C) –7 D) –8 E) –9

8. $a > b > 0$

$a = 2x - 3$

$b = x - 7$

$\Rightarrow$ **x ∈ (?, ?)**

A) (– 7, – 4) B) (4, 7) C) (4, ∞) D) (– 4, 7) E) (7, ∞)

9. $x, y, z \in R$

$x + y > y + z > x + z$

$\Rightarrow$ **? < ? < ?**

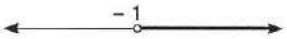
A) $z > x > y$ B) $x > z > y$ C) $x > y > z$

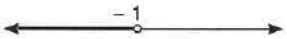
D) $y > z > x$ E) $y > x > z$

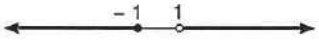
10. $x \in R$

$-4x - \frac{7}{11} < \frac{37}{11}$

$\Rightarrow$ **S.S. = ?**

A) 

B) 

C) 

D) 

E) 

11. $y \in Z,\ x \in R$

$-11 < 2x + 1 \leq 7$

$2x + y + 5 = 0$

$\Rightarrow$ **Σy = ?**

A) –36 B) –45 C) –50 D) –57 E) –67

12. $y \in Z,$

$x < -1$

$4x - y > xy - 4$

$\Rightarrow$ **min(y) = ?**

A) 13 B) 11 C) 7 D) 6 E) 5

13. $a \in Z^+,\ b, c \in R^+$

$c > 1$

$\frac{abc + a^2b}{2c - 2} > \frac{4bc + 4ba}{3c - 3}$

$\Rightarrow$ **min(a) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14. $a < 0 < b < c$

Aşağıdakilerden hangisi doğrudur?

Which of the following is true?

A) $\frac{a \cdot b}{c} > 0$ B) $\frac{a \cdot c}{b} > 0$ C) $\frac{a + b}{c}$

D) $\frac{b - a}{c} > 0$ E) $\frac{a - b}{c} > 0$

15. $a, b, c \in R$

$-1 < a < 2$

$2 < b < 4$

$-4 < c < -1$

$(2a + 3b - c) \in Z$

$\Rightarrow$ **min(2a + 3b – c) = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

16. $a < b < 0 < c$

Aşağıdakilerden hangisi doğrudur?

Which of the following is true?

A) $a + b + c > 0$ B) $a + b - c > 0$

C) $a^2 + b^2 - c^2 > 0$ D) $\frac{a \cdot b + c^2}{b - a} > 0$

E) $\frac{a \cdot b \cdot c + a^2}{a - c} > 0$

1-C 2-A 3-B 4-D 5-A 6-D 7-B 8-E 9-E 10-A 11-B 12-E 13-C 14-D 15-E 16-D

ÜNİTE 8

Unit 8

Mutlak Değer / Absolute Value

1. $|3| + |-3| + |2| + |-2| = ?$

A) 11 B) 10 C) 6 D) 2 E) 0

2. $|1| + |-2| + |3| + |-4| = ?$

A) 12 B) 11 C) 10 D) 2 E) −2

3. $|2| - |-2| + |4| - |-3| = ?$

A) 11 B) 7 C) 3 D) 1 E) 0

4. $||4| - |5|| + ||7| - |6|| = ?$

A) 3 B) 2 C) 0 D) −1 E) −2

5. $|5 - |-2| + 3| - |6| = ?$

A) 0 B) 2 C) 4 D) 6 E) 8

6. $\dfrac{|2| + 3.|-4|}{|-8| - |-6|} = ?$

A) 5 B) 7 C) 8 D) 9 E) 10

7. $|-5 - |-6| - 7 - |-8|| = ?$

A) −26 B) −2 C) 0 D) 2 E) 26

8. $|-|3| - |-|-5|| | = ?$

A) 8 B) 2 C) 0 D) −2 E) −8

9. $a > 0$

$\Rightarrow \ |a| + |-a| = ?$

A) 0 B) a C) 2a D) 1 E) 2

10. $a > 3$

$\Rightarrow \ |-4-a| + |a-2| = ?$

A) −6 B) 6 C) 2a D) 2a − 2 E) 2a + 2

11. $4 < a < 5$

$\Rightarrow \ |a-5| - |4-a| = ?$

A) 9 − 2a B) 9 + 2a C) 9 D) 1 E) −1

12. $a > 9$

$\Rightarrow \ |a-9| + |18-2a| = ?$

A) 9 − a B) a − 9 C) 3a − 9 D) 27 − 3a E) 3a − 27

13. $a > 0 > b$

$\Rightarrow \ |a-b| + |3-b| - |-2b+3a| = ?$

A) 3 + 2a B) 3 − 2a C) −3 + 2a D) −4b + 3 E) 4b − 3

14. $a < b < 0$

$\Rightarrow \ -|a+b| + |a-b| = ?$

A) 2b B) 2a C) 0 D) 2a − 2b E) − 2a + 2b

15. $a > b > c$

$\Rightarrow \ |a-b| + |b-c| - |c-a| = ?$

A) 2a − 2b B) b − c C) 2c − 2a D) 0 E) 2b − 2a

16. $a > b > 0$

$\Rightarrow \ |2a-b| - |a+b| + |3b+a| = ?$

A) 3b − 2a B) a + b C) a − b D) b + 2a E) b − 2a

1-B 2-C 3-D 4-B 5-A 6-B 7-E 8-A 9-C 10-E 11-A 12-E 13-B 14-A 15-D 16-D

1. $|x+4| = 0$

$\Rightarrow$ **x = ?**

A) -5 B) -4 C) -2 D) 0 E) 4

2. $|x| = 2$

$\Rightarrow$ **S.S. = ?**

A) $\{2\}$ B) $\{-2, 2\}$ C) $\{-2\}$ D) $\left\{\frac{1}{2}\right\}$ E) $\{2, 1\}$

3. $|x| = -3$

$\Rightarrow$ **S.S. = ?**

A) $\{-3\}$ B) $\{3\}$ C) $\varnothing$ D) $\{-3, 3\}$ E) $\{3, -3\}$

4. $|x-7| = -1$

$\Rightarrow$ **S.S. = ?**

A) $\{6\}$ B) $\{8\}$ C) $\{6, 8\}$ D) $\{-6, 8\}$ E) $\varnothing$

5. $|2x-4| = 10$

$\Rightarrow$ **S.S. = ?**

A) $\{-3, 7\}$ B) $\{-3\}$ C) $\{7\}$ D) $\varnothing$ E) $(-3, 7)$

6. $||x+1| + 10| = 12$

$\Rightarrow$ **S.S. = ?**

A) $\{-3\}$ B) $\{-3, 1\}$ C) $\{1\}$ D) $\varnothing$ E) $(-3, 1)$

7. $|4 - |x+3|| = 5$

$\Rightarrow$ **S.S. = ?**

A) $\{-12\}$ B) $\{6\}$ C) $\varnothing$ D) $\{-12, 6\}$ E) $(-12, 6)$

8. $\frac{|x+4|}{2} = 1$

$\Rightarrow$ **S.S. = ?**

A) $\varnothing$ B) $\{-2\}$ C) $\{-6\}$ D) $(-6, -2)$ E) $\{-6, -2\}$

9. $|a| + |-a| = 6$

$\Rightarrow$ **S.S. = ?**

A) $\{-3\}$ B) $\{3\}$ C) $[-3, 3]$ D) $\{-3, 3\}$ E) $\varnothing$

10. $|a| + |2a| + |-3a| = 12$

$\Rightarrow$ **S.S. = ?**

A) $\{-2\}$ B) $\{2\}$ C) $[-2, 2]$ D) $\varnothing$ E) $\{-2, 2\}$

11. $3|x+2| - |2x+4| = 5$

$\Rightarrow$ **S.S. = ?**

A) $\{-2\}$ B) $\{-7\}$ C) $[-7, 3]$ D) $\varnothing$ E) $\{-7, 3\}$

12. $\dfrac{|-x+4|}{2} = 1$

$\Rightarrow$ **S.S. = ?**

A) $\varnothing$ B) $\{-2\}$ C) $\{-6\}$ D) $(-6, -2)$ E) $\{2, 6\}$

13. $\dfrac{|x|.|-x|}{|x^2+1|} = \dfrac{1}{2}$

$\Rightarrow$ **max(x) = ?**

A) -1 B) 1 C) 2 D) 3 E) 4

14. $|-a-3| + |-2a-6| + |-3a-9| = 6$

$\Rightarrow$ **Σa = ?**

A) 2 B) 0 C) -2 D) -3 E) -6

15. $\dfrac{|-x| + |x|}{|-3x| - |5x|} = |x|$

$\Rightarrow$ **S.S. = ?**

A) $\{0\}$ B) $\varnothing$ C) R D) $\{-1\}$ E) $\{1\}$

16. $\left|x + \dfrac{1}{2}\right| + |2x+1| = 3$

$\Rightarrow$ **S.S. = ?**

A) $\left\{-\dfrac{3}{2}\right\}$ B) $\left\{\dfrac{1}{2}\right\}$ C) $\left\{-\dfrac{3}{2}, \dfrac{1}{2}\right\}$ D) $\left\{-\dfrac{1}{2}\right\}$ E) $\varnothing$

1-B 2-B 3-C 4-E 5-A 6-B 7-D 8-E 9-D 10-E 11-E 12-E 13-B 14-E 15-B 16-C

1. $|x| = |x - 1|$

$\Rightarrow$ **x = ?**

A) $\frac{1}{2}$ B) 1 C) 2 D) $\frac{5}{2}$ E) 3

2. $|x + 3| = |x - 5|$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 5

3. $|2x + 7| = |x - 3|$

$\Rightarrow$ **S.S. = ?**

A) $\{-10, 3\}$ B) $\{3\}$ C) $\{-10\}$ D) $\left\{-10, -\frac{4}{3}\right\}$ E) $\left\{-\frac{7}{2}, 3\right\}$

4. $|3x - 11| = |x + 5|$

$\Rightarrow$ **S.S. = ?**

A) $\left\{-5, \frac{11}{3}\right\}$ B) $\left\{\frac{3}{2}, 8\right\}$ C) $\{-5, 8\}$ D) $\left\{\frac{3}{2}, \frac{11}{3}\right\}$ E) $\{8\}$

5. $|x + 3| + |y + 5| = 0$

$\Rightarrow$ **(x + y) = ?**

A) -12 B) -10 C) -8 D) 0 E) 8

6. $|x + 2| + |2x - 4| = 0$

$\Rightarrow$ **S.S. = ?**

A) $\{-2\}$ B) $\{0\}$ C) $\{2\}$ D) $\varnothing$ E) R

7. $|x^2 - 4| = |x + 2|$

$\Rightarrow$ **S.S. = ?**

A) $\{-2\}$ B) $\{3\}$ C) $\{1, 3\}$ D) $\{-2, 1, 3\}$ E) $\{-2, 3\}$

8. $|x + y - 5| + |2x - y - 4| = 0$

$\Rightarrow$ **x . y = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

9. $|x+4| = -x-3$

$\Rightarrow$ **x = ?**

A) $-\frac{7}{2}$ B) -3 C) 0 D) 3 E) $\frac{7}{2}$

10. $|2x+1| = x+7$

$\Rightarrow$ **S.S. = ?**

A) $\left\{-7, -\frac{1}{2}\right\}$ B) $\{-7, 6\}$ C) $\left\{-\frac{8}{3}, -6\right\}$ D) $\left\{-\frac{8}{3}\right\}$ E) $\left\{-\frac{8}{3}, 6\right\}$

11. $|-x+4| = x$

$\Rightarrow$ **S.S. = ?**

A) $\{6\}$ B) $\{5\}$ C) $\{4\}$ D) $\{3\}$ E) $\{2\}$

12. $|3x+1| = x-7$

$\Rightarrow$ **S.S. = ?**

A) $\{-4\}$ B) R C) $\varnothing$ D) $\left\{\frac{3}{2}\right\}$ E) $\{7\}$

13. $|x+1| + |x-4| = 5$

$\Rightarrow$ **S.S. = ?**

A) $\{1, 4\}$ B) $\{-1, 0, 1, 2\}$ C) $\{-1, 4\}$ D) $[-1, 4]$ E) $(-1, 4)$

14. $|x| + |x+3| = 3$

$\Rightarrow$ **S.S. = ?**

A) $(-3, 0)$ B) $[-3, 0]$ C) $[-3, 0)$ D) $\{-3, 0\}$ E) $\{-3, -2, -1, 0\}$

15. $|x-4| + |x+5| = 7$

$\Rightarrow$ **S.S. = ?**

A) $\{-5, 4\}$ B) $\varnothing$ C) $\{-5\}$ D) $\{4\}$ E) $(-5, 4)$

16. $|x+2| + |x+7| = 6$

$\Rightarrow$ **S.S. = ?**

A) $\{-7, -2\}$ B) $\left(-\frac{15}{2}, -\frac{3}{2}\right)$ C) $\left\{-\frac{15}{2}, -\frac{3}{2}\right\}$ D) $\left[-\frac{15}{2}, -\frac{3}{2}\right]$ E) $\left\{-7, -\frac{3}{2}\right\}$

1-A 2-B 3-D 4-B 5-C 6-D 7-D 8-E 9-A 10-E 11-E 12-C 13-D 14-B 15-B 16-C

1. $a > 0$

$\Rightarrow \sqrt{a^2} - \sqrt[4]{a^4} = ?$

A) $-2a$ B) $-a$ C) 0 D) a E) $2a$

2. $a > 0 > b$

$\Rightarrow \sqrt[3]{a^3} - \sqrt[4]{b^4} = ?$

A) $a^3 - b^4$ B) $-a-b$ C) $-a+b$ D) $a+b$ E) $a-b$

3. $a > 0 > b$

$\Rightarrow \sqrt{(a-b)^2} + \sqrt{(b-a)^2} + \sqrt{4b^2} = ?$

A) $2b$ B) $-2a$ C) $2a$ D) $-2a+4b$ E) $2a-4b$

4. $|x| = -x$

$\Rightarrow \sqrt[3]{x^3} + \sqrt[4]{x^4} + \sqrt[5]{x^5} = ?$

A) $-3x$ B) $-x$ C) x D) $3x$ E) $x^3 + x^4 + x^5$

5. $a \geq 2$

$\Rightarrow \sqrt{a^2 - 4a + 4} + \sqrt{(2a-4)^2} = ?$

A) $4a - b$ B) $3a - 6$ C) $2a + 4$ D) $2a$ E) $4a$

6. $x \geq 1$

$\Rightarrow \sqrt{x^2 - 3x + \sqrt{x^2 + 2x + 1}} = ?$

A) $x - 1$ B) $x + 1$ C) $-x + 1$ D) $-x - 1$ E) $2x + 1$

7. $y > -\frac{1}{2} > x$

$\Rightarrow \sqrt{y^2 + y + \frac{1}{4}} + \sqrt{x^2 + x + \frac{1}{4}} = ?$

A) $y + x$ B) $y - x$ C) $-y - x$ D) $-x - y$ E) $x + y + 1$

8. $3 > x > 2$

$\Rightarrow \sqrt{(x-3)^2} + \sqrt{x^2 - 4x + 4} + \sqrt[3]{x^3} = ?$

A) -1 B) 0 C) $1 + x$ D) $2x - 5$ E) $-2x + 5$

9. $x \leq -3$

$\Rightarrow \sqrt{x^2 - 7x + 19 + \sqrt{x^2 + 6x + 9}} = ?$

A) $2x + 4$ B) $x + 4$ C) $x - 4$ D) $-x - 4$ E) $-x + 4$

10. $|x + 2| \leq 4$

$\Rightarrow$ **S.S. = ?**

A) $[5, 11]$ B) $(-2, 4)$ C) $\{-6, 2\}$ D) $[-6, 2]$ E) $(-6, 2)$

11. $|2x + 3| < 11$

$\Rightarrow$ **S.S. = ?**

A) $\{-7, 4\}$ B) $[-7, 4]$ C) $(-7, 4)$ D) $(-7, 4]$ E) $[-7, 4)$

12. $|-x - 6| \leq 0$

$\Rightarrow$ **S.S. = ?**

A) $\{-8\}$ B) $\{-6\}$ C) 0 D) $\{6\}$ E) $\{8\}$

13. $|2x + 2| < 0$

$\Rightarrow$ **S.S. = ?**

A) $\varnothing$ B) R C) $\{-1\}$ D) $\{1\}$ E) $\{2\}$

14. $|x| > 10$

$\Rightarrow$ **S.S. = ?**

A) $(-10, \infty)$ B) $(-\infty, -10) \cup (10, \infty)$ C) $(-10, 10)$ D) $(10, \infty)$ E) $(-\infty, -10] \cup [10, \infty)$

15. $|x + 7| \geq 4$

$\Rightarrow$ **S.S. = ?**

A) $(-\infty, 11]$ B) $(-3, \infty)$ C) $(-11, 3)$ D) $(-\infty, -11] \cup [-3, \infty)$ E) $[-11, 3]$

16. $|3x + 4| > 11$

$\Rightarrow$ **S.S. = ?**

A) $\left(-5, \frac{7}{3}\right)$ B) $\left(-\frac{7}{3}, 5\right)$ C) $\left[\frac{7}{3}, \infty\right)$ D) $(-\infty, -5)$ E) $(-\infty, -5) \cup \left(\frac{7}{3}, \infty\right)$

1-C 2-D 3-E 4-C 5-B 6-A 7-B 8-C 9-E 10-D 11-C 12-B 13-A 14-B 15-D 16-E

1. $x \in Z$,

$2 < |x| < 7$

$\Rightarrow$ **Σx = ?**

A) 0 B) 3 C) 4 D) 5 E) 12

2. $x \in Z$,

$3 < |x+3| < 5$

$\Rightarrow$ **S.S. = ?**

A) $\{1, 2\}$ B) $\{-7, -1\}$ C) $\{-7, 0\}$ D) $\{-7, 1\}$ E) $\{0, 2\}$

3. $x \in Z$,

$13 < |x+2| \leq 17$

$\Rightarrow$ **Σx = ?**

A) 54 B) 26 C) 16 D) 0 E) -16

4. $|4x + 11| > 0$

$\Rightarrow$ **S.S. = ?**

A) R B) $R - \left\{-\frac{11}{4}\right\}$ C) $\left\{-\frac{11}{4}\right\}$ D) $\varnothing$ E) $\left(0, \frac{11}{4}\right)$

5. $x < |x|$

$|x+3| < 5$

$\Rightarrow$ **S.S. = ?**

A) $(0, 2)$ B) $(-8, 2)$ C) $(-8, 0)$ D) $[-8, 0)$ E) $[-8, 2)$

6. $|x| > x$

$|4x - 3| > 5$

$\Rightarrow$ **S.S. = ?**

A) $\left(\frac{3}{4}, 2\right)$ B) $\left(-\infty, -\frac{1}{2}\right)$ C) $\left(-\frac{1}{2}, 2\right)$ D) $(2, \infty)$ E) $\left(-\infty, -\frac{1}{2}\right) \cup (2, \infty)$

7. $|x+3| \geq 2$

$|2x - 7| \leq 5$

$\Rightarrow$ **S.S. = ?**

A) $(-\infty, -5) \cup (-1, \infty)$ B) $(-5, -1)$ C) $(-1, 5)$ D) $[1, 6]$ E) $(-1, \infty)$

8. $|x| > x$

$|x+2| = 10$

$\Rightarrow$ **S.S. = ?**

A) $[-12, 8]$ B) $(-12, 8)$ C) $\{-12, 8\}$ D) $\{-12\}$ E) $\{8\}$

9. $||x| - 3| = 4$

$\Rightarrow$ **S.S. = ?**

A) $\{7\}$ B) $\{-7, 7\}$ C) $\{-7\}$ D) $\{0\}$ E) $\{-7, 0, 7\}$

10. $|x| > x$

$\Rightarrow \dfrac{|-x| + |-3x| + 2}{2|-x| + 1} = ?$

A) -2 B) 0 C) 2 D) 3 E) 4

11. $|x - 3| = |2x - 4|$

$\Rightarrow$ **S.S. = ?**

A) $\{2, 3\}$ B) $\left\{\frac{7}{3}, 3\right\}$ C) $\{2, 1\}$ D) $\left\{1, \frac{7}{3}\right\}$ E) $\{1\}$

12. $\sqrt{x^2 - 4} = x + 3$

$\Rightarrow$ **S.S. = ?**

A) $\left\{\frac{13}{6}\right\}$ B) $\{-2, 2\}$ C) $\{-3, -2, 2\}$ D) $\{-3, 2\}$ E) $\left\{-\frac{13}{6}\right\}$

13. $\sqrt{x^2 + 7} = x + 1$

$\Rightarrow$ **S.S. = ?**

A) $\{3\}$ B) $\{0\}$ C) $\{-3\}$ D) $\varnothing$ E) R

14. $|x| = 3x + 5$

$\Rightarrow$ **S.S. = ?**

A) $\left\{-\frac{5}{2}\right\}$ B) $\left\{-\frac{5}{2}, -\frac{5}{4}\right\}$ C) $\left\{-\frac{5}{4}\right\}$ D) $\left\{0, \frac{5}{4}\right\}$ E) $\left\{-\frac{5}{4}, 0\right\}$

15. $x \in R$

$y = \dfrac{7}{|x + 1| + |x + 2|}$

$\Rightarrow$ **max(y) = ?**

A) 1 B) $\frac{7}{2}$ C) 7 D) 14 E) 21

16. $x \in R$

$m = \dfrac{20}{|x + 3| + |4x - 8|}$

$\Rightarrow$ **max(m) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

1-A 2-D 3-E 4-B 5-C 6-B 7-D 8-D 9-B 10-C 11-D 12-E 13-A 14-C 15-C 16-D

1. $A = |x - 3y|$

$\min(A) \Rightarrow \dfrac{x + 4y}{x - 5y} = ?$

A) $\frac{7}{2}$ B) $\frac{3}{2}$ C) 0 D) $-\frac{3}{2}$ E) $-\frac{7}{2}$

2. $x \neq 0,\ y \neq 0,\ x \neq y$

$A = |2x + 5y|$

$\min(A) \Rightarrow \dfrac{x}{y} = ?$

A) 0 B) $-\frac{1}{2}$ C) $-\frac{3}{2}$ D) $-\frac{5}{2}$ E) $-\frac{7}{2}$

3. $x, y \in R$

$|x| < 3$

$2x + y = 5$

$\Rightarrow\ ? < y < ?$

A) $(-1, 11]$ B) $[-1, 11)$ C) $(-1, 11)$ D) $\{-1\}$ E) $\{11\}$

4. $x, y \in Z$

$|2x + 1| \leq 7$

$x + y = 10$

$\Rightarrow\ \Sigma y = ?$

A) 90 B) 84 C) 70 D) 57 E) 45

5. $|x + 1| < |x + 3|$

$\Rightarrow$ S.S. = ?

A) $(-2, \infty)$ B) $(-2, 2)$ C) $(-\infty, 2)$ D) $(2, \infty)$ E) $(-2, -\infty)$

6. $|x + 4| \leq |x - 3|$

$\Rightarrow$ S.S. = ?

A) $(-4, 3]$ B) $\left(-\infty, -\frac{1}{2}\right]$ C) $\left(-\infty, -\frac{1}{2}\right)$ D) $\left(-\frac{1}{2}, \infty\right)$ E) $\left[-\frac{1}{2}, \infty\right)$

7. $x = -\frac{1}{3},\ y = \frac{1}{2},\ z = -\frac{1}{4}$

$\Rightarrow\ \big||x| - |y + z|\big| = ?$

A) $\frac{7}{12}$ B) $\frac{5}{12}$ C) $\frac{1}{12}$ D) $\frac{1}{14}$ E) $\frac{1}{24}$

8. $x, y, z \in R^+$

$\frac{1}{a} > \frac{1}{b} > \frac{1}{c}$

$\Rightarrow\ |a - c| - |a - b| + |b - c| = ?$

A) $2c - 2a$ B) $2a - 2b$ C) 0 D) $2c - 2b$ E) $2b - 2c$

9. $3 < x < 4$

$$\Rightarrow \frac{\left|\,|x-4|\,.\,|x-3| + 3 - x\right|}{x^2 - x - 6} = ?$$

A) $\frac{x+2}{x-3}$ B) $\frac{x+3}{x-2}$ C) $\frac{x+3}{x+2}$ D) $\frac{x-5}{x+2}$ E) $\frac{x-3}{x+2}$

10. $x > 0 > y$

$|x| + |2y| = 13$

$x + y = 7$

$\Rightarrow$ **x . y = ?**

A) -14 B) -16 C) -18 D) -20 E) -22

11. $a^4 < a^3$, $|b| > b$

$$\Rightarrow \frac{|a-b|\,.\,|a| - |a^2|}{|a|} = ?$$

A) b B) $-b$ C) 0 D) a E) $a - b$

12. $1 > b > 0 > a$

$$\Rightarrow \frac{|b-1| + |a-b|}{|1-a|} = ?$$

A) $1-a$ B) $a-b$ C) -1 D) 0 E) 1

13. $x < 0$

$\left|x - |x - |x|\,|\,\right| = 6$

$\Rightarrow$ **x = ?**

A) -2 B) -1 C) 0 D) 2 E) 3

14. $|x| + |2x| + |3x| + \ldots + |10x| = 110$

$\Rightarrow$ **max(x) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $x \in Z$

$|4 - x|^{|x+1|} = 1$

$\Rightarrow$ **Σx = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

16. $3 < |x+4| < 11$

$x \geq 0$

$\Rightarrow$ **$? < x^2 < ?$**

A) $[0, 49)$ B) $(0, 49)$ C) $(1, 49)$ D) $[1, 49]$ E) $[7, 49]$

1-E 2-D 3-C 4-B 5-A 6-B 7-C 8-D 9-E 10-C 11-B 12-E 13-A 14-B 15-D 16-A

1. $a, b, c \in R,\ a \neq b \neq c$

$a - b = |a|$

$b - c = |b|$

$\Rightarrow$ **? > ? > ?**

A) $a > b > c$ B) $a > c > b$ C) $b > c > a$ D) $c > a > b$ E) $b > a > c$

2. $x, y \in R,\ x \neq 0,\ y \neq 0$

$|x \cdot y| = 4x$

$\frac{|y|}{|x|} = -2y$

$\Rightarrow$ **$x + y = ?$**

A) 4 B) $\frac{7}{2}$ C) 0 D) $-\frac{7}{2}$ E) -4

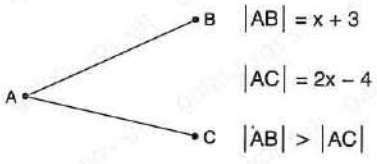
3. $x > y$

$|y| - |x| = |x - y|$ $\Rightarrow$ aşağıdaki eşitsizliklerden hangisi daima doğrudur?

Which of the following inequalities is always true?

A) $x \cdot y < 0$ B) $y - x \geq 0$ C) $\frac{x}{y} \leq 0$ D) $x + y \geq 0$ E) $x \cdot y \geq 0$

4.



$|AB| = x + 3$

$|AC| = 2x - 4$

$|AB| > |AC|$

$\Rightarrow$ **? > x > ?**

A) $(-\infty, 7)$ B) $(2, 7)$ C) $(-\infty, \infty)$ D) $(2, \infty)$ E) $(-2, \infty)$

5. $x < y < z$

$|x| = 3,\ |y| = 4,\ |z| = 5$

$x \cdot y \cdot z < 0$

$\Rightarrow$ **$x + y + z = ?$**

A) 9 B) 8 C) 6 D) -6 E) -9

6. $x, y \in R$

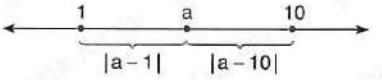
$x + y = 3$

$|x + y| - x = -1$

$\Rightarrow$ **$y = ?$**

A) 3 B) 2 C) 1 D) 0 E) -1

7.



$|a - 1| = 7,\ |a - 10| = 2$

$\Rightarrow$ **$a = ?$**

A) 10 B) 9 C) 8 D) 2 E) 1

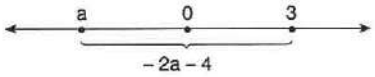
8. $f(x) \in R$

$f(x) = \sqrt{4 - |x + 1|}$

$\Rightarrow$ **? > x > ?**

A) $[-5, 3]$ B) $(-5, 3)$ C) $[3, 5]$ D) $(3, 5)$ E) $(-3, -5]$

9. $a \in Z$



$\Rightarrow$ **a = ?**

A) – 10 B) – 9 C) – 7 D) – 2 E) – 1

10. $x = |\sqrt{7} - 3|$

$y = |x - 3|$

$z = |y - 5|$

$\Rightarrow$ **z = ?**

A) $5 - \sqrt{7}$ B) $3 - \sqrt{7}$ C) $3 + \sqrt{7}$ D) $5 + \sqrt{7}$ E) $-3 + \sqrt{7}$

11. $|x + 3| \cdot |x - 7| = x + 3$

$\Rightarrow$ **S.S. = ?**

A) $(-3, 6)$ B) $(-3, 8)$ C) $\{-3, 6\}$ D) $\{-6, 8\}$ E) $\{-3, 6, 8\}$

12. $x < y < 0$

$\sqrt{x^2 + 2xy + y^2} + |x - y| + \sqrt[4]{x^4} = 12$

$\Rightarrow$ **x = ?**

A) – 3 B) – 4 C) – 6 D) – 12 E) – 18

13. $x - 3|x| + 8 = 0$

$\Rightarrow$ $\Sigma x = ?$

A) – 2 B) 0 C) 2 D) 4 E) 5

14. $|a| \leq 4$

$a^2 + b = 5$

$\Rightarrow$ **? > b > ?**

A) $-11 < b < 5$ B) $5 < b \leq 11$ C) $-11 \leq b \leq 5$ D) $-11 \leq b \leq -5$ E) $-11 < b \leq 5$

15. $|a - 2| + |b - 3| + |c - 4| + |d| = 0$

$\Rightarrow$ **a . b . c . d = ?**

A) 12 B) 8 C) 6 D) 0 E) – 12

16. $x \in R$

$A = |3x + 18| + |5x - 10|$

$\Rightarrow$ **min(A) = ?**

A) 24 B) 30 C) 36 D) 40 E) 44

1-A 2-D 3-E 4-B 5-C 6-E 7-C 8-A 9-C 10-A 11-E 12-B 13-C 14-C 15-D 16-A

ÜNİTE 9

Unit 9

Taban Aritmetiği / Base Arithmetic

1. $xx + yy = 121$

$\Rightarrow$ **max(x . y) = ?**

A) 36 B) 30 C) 28 D) 24 E) 20

2. $xy + yx + xx + yy = 132$

$\Rightarrow$ **x + y = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

3. $ab - ba = 72$

$\Rightarrow$ **max(a + b) = ?**

A) 14 B) 13 C) 12 D) 11 E) 10

4.

$$\begin{array}{r} abc \\ bca \\ +\ cab \\ \hline 1332 \end{array}$$

$\Rightarrow$ $(a \,.\, b \,.\, c)_{max} = ?$

A) 64 B) 42 C) 38 D) 32 E) 30

5. $\dfrac{abc + cab + bca}{aaa + bbb + ccc} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

6. $abc - cba = 594$

$\Rightarrow$ **min(a + c) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

7. $abc + ab + c = 123$

$\Rightarrow$ **(a + b + c) = ?**

A) 1 B) 2 C) 3 D) 4 E) 6

8. $ab + bb = 68$

$\Rightarrow$ **(a . b) = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

9. ab, ba, xy, yz iki basamaklı sayılardır.

ab, ba, xy, yz are two - digit numbers.

$ab + ba = 77$

$xy + yx = 66$

$\Rightarrow$ **max(x . a) = ?**

A) 36 B) 30 C) 29 D) 28 E) 24

10. $x = 3a4b2$

$y = 1a2b3$

$\Rightarrow$ **x − y = ?**

A) 20279 B) 20289 C) 20290 D) 20199 E) 29299

11. $A = 2m5n$

$B = m7n$

$\Rightarrow$ **A − B = ?**

A) 1980 B) 1970 C) 1960 D) 1950 E) 1940

12. $abc + acb = 444$

$\Rightarrow$ **(a + b + c) = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

13. km iki basamaklı sayıdır.

km is two - digit number.

$km = 7(k + m)$

$\Rightarrow$ **max(km) = ?**

A) 84 B) 73 C) 63 D) 52 E) 42

14. ab ve ba iki basamaklı sayılardır.

ab and ba are two - digit numbers.

$ab - ba = 2a + 5b$

$\Rightarrow$ **Σab = ?**

A) 147 B) 178 C) 189 D) 210 E) 230

15. ab iki basamaklı sayıdır.

ab is two - digit number.

$ab - a = 13 + 2a$

$\Rightarrow$ **(a + b) = ?**

A) 11 B) 10 C) 9 D) 8 E) 7

16. $a,b + b,c + c,a = 22$

$\Rightarrow$ **max[ab + ac] = ?**

A) 189 B) 190 C) 191 D) 193 E) 195

1-B 2-D 3-E 4-A 5-B 6-E 7-C 8-A 9-B 10-D 11-A 12-C 13-A 14-D 15-E 16-C

TEST 2

1. abc + cab = 455

⇒ **(a + b + c) = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

2. a + b + c = ab − ac + 7

⇒ **max(c) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. (ab + ba) = 7 . x

(ab − ba) = 5 . y

⇒ **(x + y) = ?**

A) 16 B) 18 C) 19 D) 20 E) 22

4. abc − cba = 297

⇒ **max(abc) = ?**

A) 956 B) 976 C) 988 D) 986 E) 996

5. (ab − ba) = 3x

3x iki basamaklı bir sayıdır.

3x is two - digit number.

⇒ **x = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

6. $\frac{aa}{a} + \frac{ab}{a+b} + \frac{ba}{a+b} = ?$

A) 18 B) 19 C) 22 D) 23 E) 25

7. $\frac{a0a0}{a} + \frac{b0b0}{b} + \frac{c0c0}{c} = ?$

A) 3003 B) 3030 C) 3033 D) 3330 E) 3333

8. $\frac{abcd + cdab}{ab + cd} = ?$

A) 101 B) 102 C) 110 D) 111 E) 121

9. $\dfrac{(ab + ba).(ab - ba)}{17} = 99$

$\Rightarrow$ **a . b = ?**

A) 72 B) 63 C) 56 D) 42 E) 36

10. $\dfrac{aaa}{a0a} - \dfrac{a0}{a0a} = ?$

A) – 1 B) 0 C) 1 D) 2 E) 10

11. $\dfrac{abc + bca + cab}{ab + bc + ca} = ?$

A) $\dfrac{11}{3}$ B) 8 C) 9 D) $\dfrac{111}{11}$ E) 11

12. ab, ba iki basamaklı sayılar

ab, ba are two - digit numbers.

$ab + 12 < ba$

$\Rightarrow$ $(b)_{min} = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

13. $\dfrac{x}{y} = \dfrac{2}{3}$

$\Rightarrow$ $(xy + yx)_{max} = ?$

A) 165 B) 154 C) 143 D) 132 E) 121

14. $abc + ab + a = 256$

$\Rightarrow$ $(a + b + c) = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

15. $ABC = 2(2AB)$

$\Rightarrow$ $(A + B + C)_{max} = ?$

A) 25 B) 24 C) 23 D) 22 E) 21

16. $2b = a + c$

$199 < abc < 250$

$\Rightarrow$ $\Sigma abc = ?$

A) 702 B) 888 C) 900 D) 912 E) 918

1-B 2-C 3-A 4-E 5-B 6-C 7-B 8-A 9-A 10-C 11-D 12-D 13-A 14-B 15-E 16-D

TEST 3

1. $(16)_a$

$\Rightarrow$ $(a)_{min} = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

2. $(23a)_7$

$\Rightarrow$ $\Sigma a = ?$

A) 6 B) 18 C) 19 D) 21 E) 42

3. $(132)_5 = (a)_{10}$

$\Rightarrow$ $a = ?$

A) 34 B) 36 C) 38 D) 42 E) 45

4. $(217)_9 = (A)_{10}$

$\Rightarrow$ $A = ?$

A) 170 B) 178 C) 180 D) 184 E) 188

5. $(1010101)_2 = (A)_{10}$

$\Rightarrow$ $A = ?$

A) 68 B) 79 C) 80 D) 84 E) 85

6. $(21,14)_5 = (B)_{10}$

$\Rightarrow$ $B = ?$

A) 11,36 B) 11,1 C) 11 D) 10,36 E) 10,06

7. $(20,34)_5 = (C)_{10}$

$\Rightarrow$ $C = ?$

A) 10,68 B) 10,76 C) 10,74 D) 10,80 E) 10,84

8. $(22,\overline{3})_4 = (?)_4$

A) 22 B) 22,12 C) 22,22 D) 23 E) 23,2

9. $(1,\overline{5})_7 = (?)_{10}$

A) $\frac{11}{6}$ B) 2 C) $\frac{13}{6}$ D) $\frac{17}{6}$ E) 3

10. $(12,5\overline{6})_7 = (?)_7$

A) 12,5 B) 12,6 C) 12,61 D) 12,63 E) 12,65

11. $19 = (A)_2$

$\Rightarrow$ **A = ?**

A) 11111 B) 11101 C) 11100 D) 1100 E) 10011

12. $127 = (B)_6$

$\Rightarrow$ **B = ?**

A) 311 B) 321 C) 331 D) 333 E) 335

13. $249 = (A)_8$

$\Rightarrow$ **A = ?**

A) 371 B) 372 C) 373 D) 374 E) 375

14. $(43)_5 = (x)_3$

$\Rightarrow$ **x = ?**

A) 210 B) 212 C) 214 D) 215 E) 216

15. $(108)_9 = (x)_6$

$\Rightarrow$ **x = ?**

A) 223 B) 224 C) 225 D) 226 E) 227

16. $(12312)_4 = (x)_8$

$\Rightarrow$ **x = ?**

A) 642 B) 644 C) 648 D) 650 E) 666

1-E 2-D 3-D 4-B 5-E 6-A 7-B 8-D 9-A 10-B 11-E 12-C 13-A 14-B 15-C 16-E

1. $2^4 + 2^3 + 2^2 + 1 = (x)_2$

$\Rightarrow$ x = ?

A) $(11101)_2$ B) $(11100)_2$ C) $(11011)_2$ D) $(11000)_2$ E) $(10101)_2$

2. $2.5^6 + 3.5^4 + 2.5^2 + 3 = (x)_5$

$\Rightarrow$ x = ?

A) 23233 B) 23232 C) 23230 D) 2030203 E) 203203

3. $7^3 + 7^2 + 8 = (x)_7$

$\Rightarrow$ x = ?

A) 1110 B) 1111 C) 1112 D) 1113 E) 1114

4. $4.8^4 + 3.8^3 + 2.8 + \frac{1}{8} = (x)_8$

$\Rightarrow$ x = ?

A) 430,21 B) 43020,1 C) 43021,1 D) 14322,2 E) 14332,3

5.

$$\begin{array}{r} (23)_5 \\ \times\ (24)_5 \\ \hline (x)_5 \end{array}$$

$\Rightarrow$ x = ?

A) 1210 B) 1211 C) 1212 D) 1213 E) 1214

6.

$$\begin{array}{r} (234)_6 \\ (342)_6 \\ + \\ \hline (x)_6 \end{array}$$

$\Rightarrow$ x = ?

A) 1121 B) 1120 C) 1020 D) 1010 E) 1000

7.

$$\begin{array}{r} (1303)_6 \\ (4253)_6 \\ + \\ \hline (x)_6 \end{array}$$

$\Rightarrow$ x = ?

A) 10^8 B) 10^7 C) 10^6 D) 10^5 E) 10^4

8.

$$\begin{array}{r} (23)_5 \\ (12)_5 \\ + \\ \hline (x)_5 \end{array}$$

$\Rightarrow$ x = ?

A) 44 B) 43 C) 42 D) 41 E) 40

9.

$$\begin{array}{r} (200)_8 \\ (1)_8 \\ - \\ \hline (x)_8 \end{array}$$

⇒ **x = ?**

A) 177 B) 176 C) 175 D) 174 E) 173

10.

$$\begin{array}{r} (245)_7 \\ (56)_7 \\ - \\ \hline (x)_7 \end{array}$$

⇒ **x = ?**

A) 152 B) 153 C) 154 D) 155 E) 156

11.

$$\begin{array}{r} (12)_4 \\ (23)_4 \\ \times \\ \hline (A)_4 \end{array}$$

⇒ **A = ?**

A) 132 B) 133 C) 1000 D) 1001 E) 1002

12. $(11)_2 \cdot (101)_2 = (A)_2$

⇒ **A = ?**

A) 11111 B) 11110 C) 11101 D) 1111 E) 1110

13. $(13)_4 + (18)_9 = (A)_9$

⇒ **A = ?**

A) 23 B) 24 C) 25 D) 26 E) 27

14. $(26)_5 - (12)_4 = (A)_5$

⇒ **A = ?**

A) 19 B) 20 C) 21 D) 22 E) 23

15. $(143)_5 - (10101)_2 = (A)_3$

⇒ **A = ?**

A) 222 B) 1000 C) 1001 D) 1002 E) 1011

16. $\dfrac{(200)_5}{(10)_5} = (A)_5$

⇒ **A = ?**

A) 10 B) 12 C) 20 D) 22 E) 24

1-A 2-D 3-B 4-B 5-C 6-C 7-E 8-E 9-A 10-E 11-E 12-D 13-D 14-B 15-B 16-C

1. $A \neq 0,\ B \neq 0,$

$AB - BA = 54$

$\Rightarrow$ **$\Sigma(AB) = ?$**

A) 216 B) 238 C) 240 D) 246 E) 360

2. $A \neq 0,\ B \neq 0,$

$\frac{AA}{BB} = x$

$\Rightarrow$ **max(x) = ?**

A) 7,9 B) 8 C) 8,9 D) 9 E) 9,9

3. $(AA) \cdot (BB) = 1815$

$\Rightarrow$ **(A + B) = ?**

A) 7 B) 8 C) 9 D) 14 E) 16

4. $A, B, C, D \in N,\quad ABCD \in N,\quad A \neq B \neq C \neq 0,$

$A + D = B + C$

$\Rightarrow$ **max(ABCD) − min(ABCD) = ?**

A) 8919 B) 8912 C) 8642 D) 8532 E) 8419

5. $ABCD \in N,\quad A \neq B \neq C \neq 0,$

$A \cdot D = B \cdot C$

$\Rightarrow$ **max(ABCD) = ?**

A) 9632 B) 8643 C) 6923 D) 6946 E) 6834

6.

$$\begin{array}{r} AAB \\ -\ CAD \\ \hline 305 \end{array} \qquad \begin{array}{r} AB \\ -\ CD \\ \hline x \end{array}$$

$\Rightarrow$ **x = ?**

A) 15 B) 27 C) 25 D) 30 E) 35

7.

$$\begin{array}{r} AA8 \\ -\ BB \\ \hline 95B \end{array}$$

$\Rightarrow$ **(A + B) = ?**

A) 17 B) 16 C) 15 D) 14 E) 13

8. $AB + B = BA + A$

$\Rightarrow$ **$\frac{A}{B} = ?$**

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) 1 D) 2 E) 3

9. $(121)_x = (A)_{x+1}$

$\Rightarrow$ **A = ?**

A) 100 B) 101 C) 102 D) 120 E) 121

10. $2^8 = (x)_8$

$\Rightarrow$ **x = ?**

A) 472 B) 444 C) 424 D) 404 E) 400

11. $\frac{13}{2} = (A)_8$

$\Rightarrow$ **A = ?**

A) 6,3 B) 6,4 C) 7 D) 7,2 E) 7,6

12. $\frac{121}{9} = (A)_6$

$\Rightarrow$ **A = ?**

A) 212,4 B) 21,24 C) 2,124 D) 0,2124 E) 0,02124

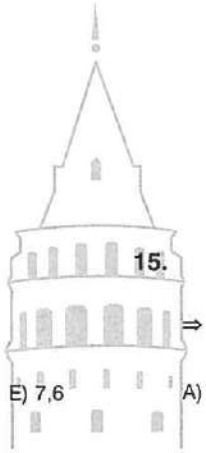
13. $4 . 3^3 + 3^4 + 3^2 + 7 = (x)_3$

$\Rightarrow$ **x = ?**

A) 14123 B) 14122 C) 21121 D) 14120 E) 14011

14. $(14,21)_6 = ?$

A) $\frac{359}{36}$ B) $\frac{369}{36}$ C) $\frac{370}{36}$ D) $\frac{373}{36}$ E) $\frac{379}{36}$



15. $(1 \times 4)_6 + (143)_x = (A)_{10}$

$\Rightarrow$ **A = ?**

A) 112 B) 116 C) 118 D) 122 E) 124

16. $x > 6,$

$(x + 1)^4 = (A)_x$

$\Rightarrow$ **A = ?**

A) 121 B) 1331 C) 13461 D) 14641 E) 14644

1-D 2-D 3-B 4-C 5-A 6-E 7-E 8-C 9-A 10-E 11-B 12-B 13-C 14-D 15-C 16-D

ÜNİTE 10

Unit 10

Sayılar / Numbers

1. a ve b asal sayı (prime number)

5^{a-b} sayısı asal sayı (prime number)

$\Rightarrow$ **a + b = ?**

A) 1 B) 3 C) 5 D) 6 E) 7

2. $a, b \in Z^+$

$a + 2b = 2n - 1$

a, b asal sayılar ise a aşağıdakilerden hangisi olamaz?

if a and b are prime numbers which of the following cannot be a?

A) 2 B) 3 C) 5 D) 7 E) 11

3. $a, b \in Z^+$

a ve b asal sayılar (a and b are prime numbers)

$a^3 + b^2 = 17$

$\Rightarrow$ **a + b = ?**

A) 3 B) 5 C) 6 D) 7 E) 8

4. $a, b \in Z^+$

$a^2 - b^2 = 17$

$\Rightarrow$ **a + b = ?**

A) 1 B) 7 C) 9 D) 13 E) 17

5. $a, b \in Z^+$

b asal sayı (b is a prime number)

$\frac{14}{a} = b$

$\Rightarrow$ **max(a) = ?**

A) 1 B) 2 C) 4 D) 7 E) 14

6. $a, b, c \in Z$,

$a \cdot b + b \cdot c = 37$

$\Rightarrow$ **max(a . c) = ?**

A) 342 B) 340 C) 336 D) 330 E) 324

7. $a \in Z^+$

$(a + 4)^{10}$ bir tek sayı ise aşağıdakilerden hangisi tektir?

if $(a + 4)^{10}$ is an odd number where $a \in Z^+$,

Which of the following is odd?

A) 2a + 4 B) a + 13 C) a + 7 D) a + 4 E) 3a − 5

8. $a, n \in Z$,

$(a + 2)^n$ tek sayı ise aşağıdakilerden hangisi daima çifttir?

if $(a + 2)^n$ is an odd number where $a, n \in Z$,

Which of the following is always even?

A) a + 7 B) a + n C) 3a + 3n D) 2a − 4n E) 2a − 5n

9. $a \in Z^+$

$(2a + 1).(b - 2) = 12$

$\Rightarrow$ **$(a + b) = ?$**

A) 5 B) 7 C) 8 D) 13 E) 14

10. $a, b \in Z^+$

$(2a - 3).(2b + 3) = 75$

$\Rightarrow$ **$\max(a \,.\, b) = ?$**

A) 72 B) 54 C) 36 D) 18 E) 9

11. $x, y, z \in N^+, \; x \neq y \neq z$

$x + 2y - 3z = 28$

$\Rightarrow$ **$\min(x + y) = ?$**

A) 20 B) 19 C) 18 D) 17 E) 16

12. $a, b \in N$

$a \,.\, b = 3b + 8$

$\Rightarrow$ **$\Sigma b = ?$**

A) 14 B) 15 C) 16 D) 17 E) 18

13. $x, y \in Z$

$x \,.\, y + x = y + 13$

$\Rightarrow$ **$\max(x) = ?$**

A) 10 B) 11 C) 12 D) 13 E) 14

14. A: asal sayı (A: prime number)

$p^3 + 1 = A$

$\Rightarrow$ **$p = ?$**

A) 0 B) 1 C) 2 D) 7 E) 11

15. $a, b \in Z^+$

$a, b > 30$

$a + b = 95$

$\Rightarrow$ **$\max(a) - \min(a) = ?$**

A) 64 B) 50 C) 33 D) 31 E) 30

16. $a, b, c \in Z^+$

$a < b < c$

$a + b + c = 125$

$\Rightarrow$ **$\max(a) = ?$**

A) 40 B) 41 C) 42 D) 43 E) 44

1-C 2-A 3-B 4-E 5-D 6-A 7-D 8-D 9-B 10-A 11-D 12-B 13-D 14-B 15-C 16-A

1. $1 + 2 + 3 + \ldots + 10 = ?$

A) 54 B) 55 C) 77 D) 99 E) 110

2. $2 + 4 + 6 + \ldots + 20 = ?$

A) 100 B) 110 C) 210 D) 315 E) 420

3. $1 + 3 + 5 + \ldots + 21 = ?$

A) 121 B) 132 C) 143 D) 154 E) 165

4. $7 + 8 + 9 + \ldots + 15 = ?$

A) 81 B) 85 C) 95 D) 99 E) 100

5. $8 + 10 + 12 + \ldots + 24 = ?$

A) 156 B) 150 C) 144 D) 142 E) 138

6. $9 + 11 + 13 + \ldots + 31 = ?$

A) 288 B) 272 C) 260 D) 256 E) 240

7. $1 + 2 + 3 + \ldots + n = 153$

$\Rightarrow$ $n = ?$

A) 15 B) 16 C) 17 D) 18 E) 19

8. $2 + 4 + 6 + \ldots + 2n = 420$

$\Rightarrow$ $n = ?$

A) 21 B) 20 C) 19 D) 18 E) 17

9. $1 + 3 + 5 + \ldots + (2n - 1) = 144$

$\Rightarrow$ **n = ?**

A) 15 B) 14 C) 13 D) 12 E) 11

10. $8 + 9 + 10 + \ldots + n = 92$

$\Rightarrow$ **n = ?**

A) 14 B) 15 C) 16 D) 17 E) 18

11. $12 + 14 + 16 + \ldots + 2n = 210$

$\Rightarrow$ **n = ?**

A) 14 B) 15 C) 16 D) 17 E) 18

12. $11 + 13 + 15 + \ldots + (2n - 1) = 416$

$\Rightarrow$ **(2n − 1) = ?**

A) 21 B) 27 C) 31 D) 37 E) 41

13. $3 + 6 + 9 + \ldots + 39 = ?$

A) 227 B) 238 C) 249 D) 260 E) 273

14. $6 + 11 + 16 + \ldots + 76 = ?$

A) 600 B) 615 C) 620 D) 630 E) 645

15. $25 - 26 + 27 - 28 + \ldots + 41 - 42 = ?$

A) −7 B) −8 C) −9 D) −10 E) −11

16. $A = 1 + 3 + 5 + \ldots + 19$

$B = 2 + 4 + 6 + \ldots + 20$

$\Rightarrow$ **B − A = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

1-B 2-B 3-A 4-D 5-C 6-E 7-C 8-B 9-D 10-B 11-B 12-E 13-E 14-B 15-C 16-D

1. $a, b \in N$

$\Rightarrow$ **min(3a + 4b) = ?**

A) 0 B) 3 C) 4 D) 7 E) 8

2. $a, b \in N, \ a \neq b$

$\Rightarrow$ **min(2a + 5b) = ?**

A) 0 B) 2 C) 5 D) 7 E) 10

3. $a, b, c \in Z^+, \ a \neq b \neq c$

$\Rightarrow$ **min(2a + 4b + 6c) = ?**

A) 0 B) 2 C) 6 D) 12 E) 20

4. $a, b \in Z^-,$

$\Rightarrow$ **max(4a + 7b) = ?**

A) −4 B) −7 C) −11 D) −15 E) −16

5. $a, b, c \in N, \ a \neq b \neq c$

$\Rightarrow$ **min(10a + 11b + 12c) = ?**

A) 0 B) 21 C) 22 D) 23 E) 31

6. $a, b \in Z^+, \ a \neq b$

$\Rightarrow$ $\max\left(\frac{2}{a} + \frac{4}{b}\right) = ?$

A) 8 B) 7 C) 6 D) 5 E) 4

7. $a, b \in Z^-$

$\Rightarrow$ $\min\left(\frac{5}{a} + \frac{3}{b}\right) = ?$

A) −8 B) $-\frac{13}{2}$ C) −6 D) $-\frac{11}{2}$ E) −5

8. $a, b \in Z^+, \ \left(4a + 5b + \frac{8}{a}\right) \in Z^+$

$\Rightarrow$ $\min\left(4a + 5b + \frac{8}{a}\right) = ?$

A) 17 B) 13 C) 11 D) 10 E) 9

9. $a, b \in N^+$

$2a = 7b$

$\Rightarrow$ **min(a + b) = ?**

A) 0 B) 4 C) 7 D) 9 E) 10

10. $a, b \in Z^+$

$4a = 12b$

$\Rightarrow$ **min(a + b) = ?**

A) 1 B) 3 C) 4 D) 8 E) 9

11. $a, b \in Z^-$

$10a = 15b$

$\Rightarrow$ **max(a + b) = ?**

A) −5 B) −6 C) −7 D) −10 E) −15

12. $a, b \in N$

$13a = 14b$

$\Rightarrow$ **min(a + b) = ?**

A) 40 B) 27 C) 14 D) 13 E) 0

13. $a, b, c \in Z^+$

$2a = 5b$

$3b = 4c$

$\Rightarrow$ **min(a + b + c) = ?**

A) 17 B) 22 C) 30 D) 38 E) 42

14. $a, b, c \in N^+$

$a \cdot b = 10$

$b \cdot c = 14$

$\Rightarrow$ **min(a + b + c) = ?**

A) 12 B) 14 C) 16 D) 18 E) 20

15. $a, b, c \in Z$

$a \cdot b = 14$

$b \cdot c = 21$

$\Rightarrow$ **max(a + b + c) = ?**

A) 12 B) 27 C) 35 D) 36 E) 38

16. $a, b, c \in Z$

$a \cdot b = 20$

$b \cdot c = 36$

$\Rightarrow$ **min(a + b + c) = ?**

A) −58 B) −57 C) −18 D) 18 E) 57

1-A 2-B 3-E 4-C 5-E 6-D 7-A 8-A 9-D 10-C 11-A 12-E 13-A 14-B 15-D 16-B

1. $0! + 1! + 2! + 3! = ?$

A) 34 B) 20 C) 16 D) 10 E) 8

2. $\frac{5!}{4!} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\frac{5! - 4!}{4! - 3!} = ?$

A) $\frac{16}{3}$ B) 5 C) $\frac{14}{3}$ D) $\frac{13}{3}$ E) 4

4. $\frac{2! + 3! + 4!}{3! + 2!} = ?$

A) 3 B) 4 C) 6 D) 10 E) 12

5. $\frac{10! \cdot 9!}{8! \cdot 7! \cdot 6!} = ?$

A) $\frac{21}{2}$ B) 10 C) 9 D) $\frac{17}{2}$ E) 8

6. $\frac{15! + 14!}{13! + 12!} = ?$

A) 220 B) 218 C) 208 D) 190 E) 185

7. $\frac{n!}{(n-1)!} = 5$

$\Rightarrow n = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

8. $\frac{(n+1)!}{(n-1)!} = 12$

$\Rightarrow n = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

9. $\dfrac{(n+1)!}{n!} + \dfrac{n!}{(n-1)!} = 7$

$\Rightarrow$ **n! = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

10. $\dfrac{(n+3)!\,.\,(n+1)!\,.\,n!}{(n+2)!\,.\,(n-1)!\,.\,(n+4)!} = \dfrac{3}{35}$

$\Rightarrow$ **n = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

11. $5!\,.\,7 = x$

$\Rightarrow$ **5! + 6! + 7! = ?**

A) 8x B) 7x C) 6x D) 5x E) 4x

12. $\dfrac{(n-3)! + n!}{(3-n)! + (n+1)!} = ?$

A) $\dfrac{7}{22}$ B) $\dfrac{7}{23}$ C) $\dfrac{7}{24}$ D) $\dfrac{7}{25}$ E) $\dfrac{7}{26}$

13. $\dfrac{(n+1)!}{3!} = 120$

$\Rightarrow$ **n = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

14. $\dfrac{72}{n!} = 12$

$\Rightarrow$ **n = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

15. $\dfrac{8!\,.\,9\,.\,10}{12!} = \dfrac{1}{11} - \dfrac{1}{n}$

$\Rightarrow$ **n = ?**

A) 14 B) 13 C) 12 D) 11 E) 10

16. $6\,.\,n! = m!$

$\Rightarrow$ **max(n + m) = ?**

A) 11 B) 13 C) 120 D) 123 E) 126

1-D 2-E 3-A 4-B 5-C 6-C 7-A 8-B 9-E 10-E 11-B 12-D 13-A 14-A 15-C 16-A

1. $x, y \in Z^+$

$10! = 2^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 9 B) 8 C) 7 D) 6 E) 5

2. $x, y \in Z^+$

$15! = 3^x \cdot y$

$\Rightarrow$ Σx **= ?**

A) 6 B) 7 C) 17 D) 21 E) 22

3. $x, y \in Z^+$

$23! = 5^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

4. $x, y \in Z^+$

$27! = 10^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

5. $x, y \in Z^+$

$18! = 6^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

6. $x, y \in Z^+$

$29! = 15^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

7. $x, y \in Z^+$

$32! = 4^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 31 B) 28 C) 21 D) 16 E) 15

8. $x, y \in Z^+$

$33! = 8^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 4 B) 6 C) 8 D) 10 E) 11

9. $(48! - 1)$

sayısının sondan kaç basamağı 9 dur?
How many digits from the last of $(48! - 1)$ number is 9?

A) 15 B) 13 C) 11 D) 10 E) 9

10. $(25! - 1)$

sayısının sondan 6 basamağındaki rakamların toplamı kaçtır?
What is the sum of the last 6 digits of the number $(25! - 1)$?

A) 54 B) 45 C) 36 D) 27 E) 18

11. $x, y \in Z^+$

$8! + 9! = 2^x \cdot y$

$\Rightarrow$ $\Sigma x = ?$

A) 45 B) 36 C) 30 D) 27 E) 25

12. $x, y \in Z^+$, y tek sayı (y is an odd number)

$\frac{10!}{2^x} = y$

$\Rightarrow$ **max(x) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

13. $A, B \in Z^+$, B tek sayı (B is an odd number)

$\frac{15!}{A} = B$

$\Rightarrow$ **max(A) = ?**

A) 15! B) 1500 C) 50 D) 15 E) 1

14. $x, y, z \in Z^+$

$29! = 2^x \cdot 3^y \cdot z$

$\Rightarrow$ **max(x + y) = ?**

A) 63 B) 51 C) 38 D) 25 E) 13

15. $x, y \in Z^+$

$76! - 70! = 10^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 14 B) 15 C) 16 D) 17 E) 18

16. $x, y \in Z^+$

$9! + 10! + 11! = 11^x \cdot y$

$\Rightarrow$ **max(x) = ?**

A) 1 B) 2 C) 3 D) 5 E) 7

1-B 2-D 3-B 4-A 5-C 6-E 7-E 8-D 9-D 10-A 11-B 12-E 13-A 14-C 15-C 16-B

1. $a, b \in Z^+$

$3 \cdot a = b^2$

$\Rightarrow$ **min(a) = ?**

A) 3 B) 4 C) 9 D) 12 E) 36

2. $a, b \in Z^+$

$6 \cdot a = b^2$

$\Rightarrow$ **min(a + b) = ?**

A) 6 B) 12 C) 20 D) 36 E) 42

3. $a, b \in Z^+$

$20 \cdot a = b^2$

$\Rightarrow$ **min(a) = ?**

A) 4 B) 5 C) 8 D) 20 E) 45

4. $a, b \in Z^+$

$54 \cdot a = b^2$

$\Rightarrow$ **min(b) = ?**

A) 6 B) 9 C) 18 D) 36 E) 40

5. $a, b \in Z^+$

$12 \cdot a = b^3$

$\Rightarrow$ **min(a) = ?**

A) 6 B) 9 C) 15 D) 16 E) 18

6. $a, b \in Z^+$

$\frac{a}{15} = b^3$

$\Rightarrow$ **min(a) = ?**

A) 120 B) 45 C) 30 D) 15 E) 1

7. $a, b \in Z^+$

$\frac{a^4}{24} = b$

$\Rightarrow$ **min(a + b) = ?**

A) 38 B) 42 C) 48 D) 54 E) 60

8. $a, b \in Z^+$

$18a^2 = b^3$

$\Rightarrow$ **min(a) = ?**

A) 18 B) 36 C) 72 D) 108 E) 120

9. $a, b \in Z^+$

$\frac{72}{a} = b^3$

$\Rightarrow$ **max(a) = ?**

A) 72 B) 36 C) 9 D) 2 E) 1

10. $a, b \in Z^+$

$200 \,.\, a = b^4$

$\Rightarrow$ **min(a) = ?**

A) 5 B) 10 C) 25 D) 50 E) 75

11. $a, b \in Z^+$

$36 \,.\, a = b$

$\Rightarrow$ **min(a) = ?**

A) 16 B) 9 C) 4 D) 1 E) 0

12. $a, b, c \in Z^+$, min(c) için, (for min(c))

$36 \,.\, a \,.\, b = c^3$

$\Rightarrow$ **max(a + b) = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

13. $a, b, c \in Z^+$, min(c) için, (for min(c))

$28 \,.\, a \,.\, b = c^2$

$\Rightarrow$ **(a + b) = ?**

A) 6 B) 7 C) 8 D) 9 E) 14

14. $a, b, c, d \in Z^+$

$120 \,.\, a \,.\, b \,.\, c = d^2$

$\Rightarrow$ **min(a + b + c + d) = ?**

A) 32 B) 62 C) 90 D) 70 E) 95

15. $a, b \in Z^+$

$7! \,.\, a = b^2$

$\Rightarrow$ **min(a) = ?**

A) 5 B) 7 C) 18 D) 25 E) 35

16. $a, b \in Z^+$

$11! \,.\, a = b^2$

$\Rightarrow$ **min(a) = ?**

A) 88 B) 80 C) 77 D) 70 E) 66

1-A 2-B 3-B 4-C 5-E 6-D 7-E 8-A 9-A 10-D 11-D 12-B 13-C 14-D 15-E 16-C

1. $a, b \in N$

$a + b = 10$

$\Rightarrow$ **min(a . b) = ?**

A) 0 B) 9 C) 16 D) 21 E) 24

2. $a, b \in N,$

$a + b = 10$

$\Rightarrow$ **max(a . b) = ?**

A) 16 B) 21 C) 24 D) 25 E) 26

3. $a, b \in Z^+,$

$a + b = 13$

$\Rightarrow$ **max(a . b) = ?**

A) 48 B) 42 C) 40 D) 36 E) 30

4. $a, b \in Z^+,$

$a + b = 100$

$\Rightarrow$ **max(a . b) = ?**

A) 99 B) 900 C) 1600 D) 2400 E) 2500

5. $a, b \in Z^-$

$a + b = -7$

$\Rightarrow$ **min(a . b) = ?**

A) -6 B) -4 C) 0 D) 6 E) 14

6. $a, b \in Z^-$

$a + b = -7$

$\Rightarrow$ **max(a . b) = ?**

A) 15 B) 14 C) 12 D) 10 E) 6

7. $k, a, b \in Z^-$

$a + b = k$

$\Rightarrow$ **min(a . b) = ?**

A) $-k$ B) $-k - 1$ C) $-k + 1$ D) k E) $k + 1$

8. $m, a, b \in Z^+$, m: çift (m: even)

$a + b = m$

$\Rightarrow$ **max(a . b) = ?**

A) $\frac{m^2}{4}$ B) $\frac{m^2 - 1}{4}$ C) $\frac{m - 1}{2}$ D) $m - 1$ E) $m - 2$

9. $a, b \in N$

$a \cdot b = 10$

$\Rightarrow$ **max(a + b) = ?**

A) −11 B) −7 C) 0 D) 7 E) 11

10. $a, b \in N$,

$a \cdot b = 20$

$\Rightarrow$ **min(a + b) = ?**

A) 21 B) 12 C) 9 D) 8 E) 6

11. $a, b \in Z$,

$a \cdot b = 30$

$\Rightarrow$ **min(a + b) + max(a + b) = ?**

A) 0 B) 27 C) 31 D) 42 E) 62

12. $a, b, c \in Z$

$a \cdot b = 14$

$b \cdot c = 21$

$\Rightarrow$ **min(a + b + c) = ?**

A) −36 B) −35 C) 24 D) 18 E) 12

13. $a, b, c \in Z^+$

$a \cdot b = 15$

$b \cdot c = 10$

$\Rightarrow$ **min(a + b + c) = ?**

A) 9 B) 10 C) 12 D) 25 E) 26

14. $a, b \in Z^+$

$a \cdot b = k$

$\Rightarrow$ **max(a + b) = ?**

A) k − 1 B) k C) k + 1 D) 2k − 1 E) 2k

15. $a, b, c \in Z$

$a \cdot b = 72$

$a \cdot c = 27$

$\Rightarrow$ **max(a + b + c) = ?**

A) 100 B) 90 C) 81 D) 77 E) 68

16. $a, b, c \in Z^+$

$a \cdot b = k$

$b \cdot c = m$

$\Rightarrow$ **max(a + b + c) = ?**

A) k − m + 2 B) k − m + 1 C) k + m D) k + m + 1 E) k + m + 2

1-A 2-D 3-B 4-E 5-D 6-C 7-B 8-A 9-E 10-C 11-A 12-A 13-B 14-C 15-A 16-D

1.

$$\begin{array}{r|l} 1003 & 25 \\ \hline - & B \\ \hline K & \end{array}$$

⇒ **(B + K) = ?**

A) 40 B) 43 C) 45 D) 47 E) 48

2.

$$\begin{array}{r|l} A & 5 \\ \hline - & 7 \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} B & 4 \\ \hline - & 3 \\ \hline 3 & \end{array}$$

⇒ **(A + B) = ?**

A) 15 B) 37 C) 45 D) 52 E) 57

3.

$$\begin{array}{r|l} A & B \\ \hline - & 2 \\ \hline 4 & \end{array} \qquad \begin{array}{r|l} B & C \\ \hline - & 3 \\ \hline 5 & \end{array}$$

⇒ **C nin A türünden değeri nedir?**

What is the value of C in terms of A?

A) $6A - 14$ B) $\frac{A-6}{14}$ C) $\frac{A+6}{14}$ D) $\frac{A+14}{6}$ E) $\frac{A-14}{6}$

4.

$$\begin{array}{r|l} A & B \\ \hline - & 3 \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} B & 5 \\ \hline - & 3 \\ \hline 2 & \end{array}$$

⇒ **A = ?**

A) 51 B) 53 C) 55 D) 57 E) 59

5. $K \in Z^+$,

$$\begin{array}{r|l} A & B \\ \hline - & 12 \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} A & 6 \\ \hline - & \\ \hline K & \end{array}$$

⇒ **K = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

6. $A, B, C, K \in Z^+$

$$\begin{array}{r|l} A & B \\ \hline - & 4 \\ \hline 5 & \end{array} \qquad \begin{array}{r|l} B & C \\ \hline - & 4 \\ \hline 5 & \end{array} \qquad \begin{array}{r|l} A & 4 \\ \hline - & \\ \hline K & \end{array}$$

⇒ **K = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

7. $A, B, C \in Z^+$

$$\begin{array}{r|l} A & B \\ \hline - & 4 \\ \hline 3 & \end{array} \qquad \begin{array}{r|l} A & 2B+1 \\ \hline - & C \\ \hline 1 & \end{array}$$

⇒ **C = ?**

A) 2 B) $\frac{4B+2}{B+1}$ C) $\frac{B-2}{2B+1}$ D) 3 E) $\frac{4B-1}{B+1}$

8.

$$\begin{array}{r|l} ab0ab & ab \\ \hline - & B \\ \hline K & \end{array}$$

⇒ **B = ?**

A) 1000 B) 1001 C) 1002 D) 1010 E) 1011

9. A, B ∈ N,

$$\begin{array}{r|l} A & B \\ \hline & 7 \\ \hline - & \\ \hline 2B-7 & \end{array}$$

⇒ **max(A) = ?**

A) 34 B) 39 C) 41 D) 43 E) 47

10. A, x ∈ N^+,

$$\begin{array}{r|l} A & 16 \\ \hline & x \\ \hline - & \\ \hline x^2 & \end{array}$$

⇒ **A_{max} = ?**

A) 57 B) 54 C) 52 D) 48 E) 47

11. A, x ∈ Z^+,

$$\begin{array}{r|l} A & x^2 \\ \hline & x \\ \hline - & \\ \hline 29 & \end{array}$$

⇒ **min(A) = ?**

A) 196 B) 200 C) 216 D) 245 E) 256

12.

$$\begin{array}{r|l} abcd & 10 \\ \hline & \\ \hline - & \\ \hline 3 & \end{array}$$

⇒ **d = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

13.

$$\begin{array}{r|l} a00b & 5 \\ \hline & \\ \hline - & \\ \hline 3 & \end{array}$$

⇒ **$(b)_{max}$ = ?**

A) 2 B) 3 C) 5 D) 6 E) 8

14.

$$\begin{array}{r|l} 4a7b & 3 \\ \hline & \\ \hline - & \\ \hline 2 & \end{array}$$

⇒ **max(a + b) = ?**

A) 24 B) 21 C) 18 D) 15 E) 12

15.

$$\begin{array}{r|l} a0a & 15 \\ \hline & \\ \hline - & \\ \hline 2 & \end{array}$$

⇒ **(a) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

16.

$$\begin{array}{r|l} 1471 & 3 \\ \hline & \\ \hline - & \\ \hline A & \end{array} \qquad \begin{array}{r|l} 1471 & 4 \\ \hline & \\ \hline - & \\ \hline B & \end{array} \qquad \begin{array}{r|l} 1471 & 5 \\ \hline & \\ \hline - & \\ \hline C & \end{array}$$

⇒ **(A + B + C) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

1-B 2-D 3-E 4-B 5-A 6-B 7-A 8-B 9-E 10-A 11-D 12-B 13-E 14-C 15-D 16-A

1. 120 sayısının pozitif tam sayı bölenleri kaç tanedir?
How many positive integer divisors does the number 120 have?

A) 24 B) 16 C) 15 D) 12 E) 9

2. 80 sayısının pozitif tam sayı bölenlerinin toplamı kaçtır?
What is the sum of positive integer divisors of the number 80?

A) 10 B) 20 C) 60 D) 180 E) 186

3. 72 sayısının negatif tam sayı bölenlerinin toplamı kaçtır?
What is the sum of the negative integer divisors of the number 72?

A) −160 B) −180 C) −185 D) −195 E) −200

4. 140 sayısının tam bölenlerinin toplamı kaçtır?
What is the sum of the aliquot of the number 140?

A) 24 B) 12 C) 0 D) −12 E) −24

5. 150 sayısının asal olmayan pozitif tam sayı bölenleri kaç tanedir?
How many non - prime pozitive integer divisors does the number 150 have?

A) 12 B) 9 C) 8 D) 6 E) 3

6. 105 sayısının asal olmayan negatif tam sayı bölenleri kaç tanedir?
How many non - prime negative integer divisors does the number 105 have?

A) 8 B) 6 C) 5 D) 4 E) 3

7. 180 sayısının tam bölenleri kaç tanedir?
How many aliquot does the number 180 have?

A) 108 B) 72 C) 36 D) 18 E) 9

8. 50 sayısının asal olmayan tam bölenlerinin toplamı kaçtır?
What is the sum of the non - prime aliquot does the number 50 have?

A) −14 B) −7 C) 0 D) 7 E) 14

9. $A, a, b, c \in Z^+$,

$A = 3a = 2b = 4c$

$\Rightarrow$ **min(A) = ?**

A) 12 B) 18 C) 24 D) 30 E) 36

10. $a, b, c, A \in Z^+$, $A < 100$

$A = 2a = 3b = 5c$

$\Rightarrow$ **max(A) = ?**

A) 96 B) 90 C) 88 D) 78 E) 68

11. $a, b, c, A \in Z^+$

$A = 2a + 1 = 3b + 1 = 4c + 1$

$\Rightarrow$ **min(A) = ?**

A) 12 B) 13 C) 14 D) 16 E) 19

12. $a, b, c, A \in Z^+$, $A < 200$

$A = 3a + 2 = 4b + 1 = 5c - 2$

$\Rightarrow$ **max(A) = ?**

A) 183 B) 180 C) 173 D) 113 E) 53

13. $A, a, b, c \in Z^+$, $A < 140$

$A = 2a - 5 = 3b - 4 = 5c$

$\Rightarrow$ **ΣA = ?**

A) 100 B) 195 C) 210 D) 300 E) 325

14. $x \in Z^+$, $x < 200$

$\frac{x}{15} \in Z$, $\frac{x}{20} \in Z$

$\Rightarrow$ **Σx = ?**

A) 30 B) 90 C) 180 D) 360 E) 380

15. $x \in Z^+$,

$\frac{60}{x} \in Z$, $\frac{90}{x} \in Z$

$\Rightarrow$ **max(x) = ?**

A) 180 B) 90 C) 60 D) 30 E) 15

16. $x \in Z^+$,

$\frac{100}{x} \in Z$, $\frac{150}{x} \in Z$

$\Rightarrow$ **Σx = ?**

A) 93 B) 90 C) 50 D) 40 E) 35

1-B 2-E 3-D 4-C 5-B 6-A 7-C 8-B 9-A 10-B 11-B 12-C 13-E 14-D 15-D 16-A

1. $a, b \in Z^+$,

$a \cdot b = 24$

$\frac{a}{b} = \frac{2}{3}$

$\Rightarrow$ **$(a + b) = ?$**

A) 5 B) 10 C) 13 D) 14 E) 25

2. $a, b, c, d \in Z^+$, $a \neq b \neq c \neq d$

$\frac{a}{b}, \frac{b}{c}, \frac{c}{d} \in Z^+$

$\Rightarrow$ **$\min\left(\frac{a}{b} + \frac{b}{c} + \frac{c}{d}\right) = ?$**

A) 1 B) 2 C) 4 D) 5 E) 6

3. $a, b, c \in N$

$a + b + c = 20$

$\Rightarrow$ **$\max(a \cdot b \cdot c) = ?$**

A) 302 B) 300 C) 294 D) 275 E) 250

4. $A, B \in Z^+$

$A = 13 - 4x$

$B = 4x + 27$

$\Rightarrow$ **$\max(A \cdot B) = ?$**

A) 400 B) 375 C) 351 D) 275 E) 209

5. $\frac{1}{3} + \frac{5}{3} + \frac{9}{3} + \ldots + \frac{81}{3} = A$

$\Rightarrow$ **$A = ?$**

A) 266 B) 273 C) 280 D) 287 E) 294

6. **$5 - 6 - 7 + 8 - 9 - 10 + 11 - 12 - 13 + \ldots - 70 = ?$**

A) −869 B) −790 C) 0 D) 790 E) 869

7. $(x + 3) + (x + 5) + (x + 7) + \ldots + (x + 19) = 162$

$\Rightarrow$ **$x + (x + 1) + \ldots + (x + 10) = ?$**

A) 99 B) 110 C) 121 D) 132 E) 143

8. $n + (n + 1) + (n + 2) + \ldots + (n + 99) = x$

$(n + 7) + (n + 8) + (n + 9) + \ldots + (n + 100) = y$

$x - y = 17$

$\Rightarrow$ **$n = ?$**

A) 15 B) 16 C) 17 D) 18 E) 19

9. $20! = \dfrac{x}{21 \,.\, 22}$

$\Rightarrow$ **22! + 23! = ?**

A) 20x B) 22x C) 23x D) 24x E) 25x

10. $50! = x$

$\Rightarrow$ **4 . 8 . 12 . 16 . . . 204 = ?**

A) $55 \,.\, 2^{105} \,.\, x$ B) $55 \,.\, 2^{104} \,.\, x$

C) $51 \,.\, 2^{104} \,.\, x$ D) $51 \,.\, 2^{102} \,.\, x$

E) $51 \,.\, 2^{100} \,.\, x$

11. $5! + 6! + \ldots + 10! = A$

$$\begin{array}{r|l} A & 70 \\ \hline & \\ \hline K & \end{array}$$

$\Rightarrow$ **K = ?**

A) 0 B) 1 C) 5 D) 20 E) 35

12. **(2! . 2 + 3! . 3 + 4! . 4 + . . . + 10! . 10) = ?**

A) 11! + 2! B) 11! − 2! C) 10! + 1

D) 10! − 1 E) 9! + 8!

13. $\dfrac{5!}{7!} + \dfrac{6!}{8!} + \dfrac{7!}{9!} + \ldots + \dfrac{15!}{17!} = ?$

A) $\dfrac{17}{112}$ B) $\dfrac{15}{112}$ C) $\dfrac{13}{112}$ D) $\dfrac{11}{102}$ E) $\dfrac{7}{102}$

14. $1! + 2! + 3! + \ldots + 19! = A$

$$\begin{array}{r|l} A & 10 \\ \hline & \\ \hline K & \end{array}$$

$\Rightarrow$ **K = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

15. $x, y \in N$

$48! = 28^x \,.\, y$

$\Rightarrow$ **max(x) = ?**

A) 46 B) 23 C) 11 D) 7 E) 6

16. $m, x, y, z \in N$

$25! = 3^x \,.\, 4^y \,.\, 10^z \,.\, m$

$\Rightarrow$ **max(x + y + z) = ?**

A) 27 B) 29 C) 36 D) 38 E) 39

1-B 2-E 3-C 4-A 5-D 6-A 7-D 8-B 9-D 10-D 11-A 12-B 13-D 14-E 15-E 16-A

1. $a, b \in Z^+$,

$$\begin{array}{r|l} a & b \\ \hline & 3 \\ \hline & 4 \end{array}$$

$a - b = 44$

$\Rightarrow$ **a = ?**

A) 20 B) 40 C) 60 D) 64 E) 84

2. $K + B = 10014$

$$\begin{array}{r|l} abcabca & abc \\ \hline - & B \\ \hline & K \end{array}$$

$\Rightarrow$ **K = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

3. 2a iki basamaklı bir sayı, (2a is a two - digit number)

$$\begin{array}{r|l} 64\ldots & 2a \\ \hline - & 3\ldots \\ \hline & \ldots \end{array}$$

$\Rightarrow$ **Σa = ?**

A) 0 B) 1 C) 3 D) 6 E) 10

4. $A, B, C \in Z^+$,

$$\begin{array}{r|l} A & B \\ \hline & 4 \\ \hline & 13 \end{array} \qquad \begin{array}{r|l} C & 15 \\ \hline & 2 \\ \hline & B \end{array}$$

$\Rightarrow$ **A + B = ?**

A) 44 B) 55 C) 83 D) 100 E) 106

5. $A, x^2 \in Z$,

$$\begin{array}{r|l} A & 19 \\ \hline & 3 \\ \hline & x^2 \end{array}$$

$\Rightarrow$ **max(A) = ?**

A) 77 B) 76 C) 75 D) 74 E) 73

6.

$$\begin{array}{r|l} A & 8 \\ \hline & B \\ \hline & 3 \end{array} \qquad \begin{array}{r|l} B & 7 \\ \hline & C \\ \hline & 3 \end{array} \qquad \begin{array}{r|l} A & 28 \\ \hline & \\ \hline & K \end{array}$$

$\Rightarrow$ **K = ?**

A) 27 B) 26 C) 8 D) 7 E) 3

7. $C > 4$,

$$\begin{array}{r|l} A & B-1 \\ \hline & C+2 \\ \hline & 4 \end{array} \qquad \begin{array}{r|l} A & B+1 \\ \hline & C+1 \\ \hline & 5 \end{array} \qquad \begin{array}{r|l} B & C \\ \hline & \\ \hline & K \end{array}$$

$\Rightarrow$ **K = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

8. $A, x \in Z^+$,

$$\begin{array}{r|l} A & 28 \\ \hline & x \\ \hline & x^3 \end{array}$$

$\Rightarrow$ **max(A) = ?**

A) 64 B) 111 C) 120 D) 176 E) 265

9. $a, b \in Z^+$

$(4b - 1) . (a - 2) = 15$

$\Rightarrow$ **min(a . b) = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

10. ab, cd iki basamaklı sayılardır.

ab, cd are two - digit numbers.

$$\begin{array}{r} ab \\ \times\ cd \\ \hline 96 \\ +\ 48 \\ \hline 144 \end{array}$$

$\Rightarrow$ **ab(c + d) = ?**

A) 132 B) 138 C) 142 D) 144 E) 150

11. $aaa = \dfrac{999}{a}$

$\Rightarrow$ **a = ?**

A) 9 B) 6 C) 5 D) 4 E) 3

12. $a . x = 10$

$b . x = 11$

$c . x = 12$

$\Rightarrow$ **x(abc) = ?**

A) 1244 B) 1124 C) 1122 D) 1120 E) 1110

13. $a, b, c \in Z^+, \quad c > 10$

$3a = 2b$

$5b = 6c$

$\Rightarrow$ **min(a + b + c) = ?**

A) 15 B) 30 C) 45 D) 60 E) 75

14. $a, b \in Z$

$a . b = 63$

$\Rightarrow$ Σ**(a + b) = ?**

A) 104 B) 88 C) 80 D) 64 E) 0

15. $a, b \in N,$

$a + b = 21$

Kaç farklı (a, b) sıralı ikilisi vardır?

How many different (a, b) ordered pairs are there?

A) 10 B) 11 C) 19 D) 21 E) 22

16. $a, b, c \in N, \quad a \neq b \neq c$

$2a + 3b + 7c = 107$

$\Rightarrow$ **max(c) = ?**

A) 16 B) 15 C) 13 D) 11 E) 10

1-D 2-B 3-B 4-C 5-C 6-A 7-A 8-B 9-B 10-D 11-E 12-C 13-C 14-E 15-E 16-B

1. $A, a, b, c \in Z^+$

$A = 3a + 2 = 4b + 2 = 2c - 2$

$\Rightarrow$ **min(A) = ?**

A) 12 B) 14 C) 16 D) 24 E) 26

2. $A \in Z^+$, $a, b \in Z$, $A < 50$

$A = 3a - 18 = 2b + 17$

$\Rightarrow$ **ΣA = ?**

A) 260 B) 246 C) 243 D) 216 E) 165

3. $x \in Z^+$,

$\frac{52}{x} \in Z$, $\frac{65}{x} \in Z$

$\Rightarrow$ **Σx = ?**

A) 13 B) 14 C) 26 D) 39 E) 40

4. $x \in Z$,

$\frac{A}{x} \in Z$, $\frac{B}{x} \in Z$

$\Rightarrow$ **max(x) = ?**

A) A + B B) A − B C) A . B

D) EBOB(A, B) E) EKOK(A, B)

5. $x, y \in Z^+$,

$x \,.\, (8!) = y^2$

$\Rightarrow$ **min(x) = ?**

A) 70 B) 35 C) 14 D) 7 E) 5

6. $a \in Z^+$,

p: asal sayı ve $p = a^2 + 3$ için aşağıdakilerden hangisi daima doğrudur?

p: prime number.

Which of the following is a always true for $p = a^2 + 3$.

A) a: çift (a: even) B) a: tek (a: odd)

C) (p − 4): asal (p − 4): prime D) min(p) = 5

E) (p + 3): asal (p + 3): prime

7. $a, b \in Z^+$

$\frac{a!}{b!} = 210$

$\Rightarrow$ **$\Sigma(a + b)$ = ?**

A) 430 B) 419 C) 219 D) 109 E) 11

8.

$$\begin{array}{r} ABC \\ \times \quad 18 \\ \hline \bullet\bullet\bullet\bullet \\ + \quad 143 \\ \hline m \end{array}$$

$\Rightarrow$ **m = ?**

A) 2574 B) 2754 C) 2764

D) 2774 E) 2784

9. $a, b, c \in R$

$a \cdot b = 2$

$a \cdot c = 3$

$a + 2b + 4c = 8$

$\Rightarrow$ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

10. $a, b, c, d \in Z$

$8! - 7! = 2^a \cdot 3^b \cdot 5^c \cdot 7^d$

$\Rightarrow$ **a + b + c + d = ?**

A) 11 B) 10 C) 9 D) 8 E) 7

11. $x, y, z \in Z^+$

$2x = 5y = 6z$

$x + y + z < 160$

$\Rightarrow$ **max(x + y + z) = ?**

A) 156 B) 150 C) 130 D) 104 E) 100

12. $a, b \in Z^+$,

$(a + b^2 - ab - b)$

tek sayı ise aşağıdakilerden hangisi tektir?
if it is an odd number, which of the following is odd?

A) $a \cdot b$ B) $a^2 + 3$ C) $a + b$ D) $a \cdot b + b$ E) $a^b + b^a + 1$

13. $a, b, c \in R^+$,

$a \cdot b + b \cdot c = 4$

$\frac{a + c}{b} = \frac{1}{25}$

$\Rightarrow$ **a + b + c = ?**

A) $\frac{2}{51}$ B) $\frac{5}{52}$ C) 10 D) $\frac{52}{5}$ E) $\frac{51}{2}$

14. Aşağıdaki sayılardan hangisi asal olabilir?

Which of the following numbers can be prime?

A) $7! + 8!$ B) $3^8 - 5^3$ C) $2^{11} - 1$ D) 1269 E) 1474

15. $a \in Z^+$, $20A \in Z^+$,

$A = \frac{4a + 2}{a}$

$\Rightarrow$ **Σa = ?**

A) 50 B) 70 C) 90 D) 96 E) 98

16. $A > 1$,

$$\begin{array}{r|l} A & 5 \\ & x \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} A & 11 \\ & y \\ \hline & 1 \end{array}$$

$\Rightarrow$ **min(A) = ?**

A) 52 B) 53 C) 54 D) 55 E) 56

1-B 2-D 3-B 4-D 5-A 6-A 7-A 8-A 9-B 10-C 11-A 12-C 13-D 14-C 15-C 16-E

1. $a > b$

$$\begin{array}{r|l} a47b & 6 \\ \hline 0 & \end{array}$$

⇒ **max(a + b) için (a . b) = ?**
What is (a . b) for max(a + b)?

A) 64 B) 56 C) 42 D) 32 E) 24

2. $a \neq b$,

EKOK(a, b) = 40

⇒ **max(a + b) + min(a + b) = ?**

A) 60 B) 73 C) 83 D) 121 E) 141

3. $x = ABC$
$A + B + C = 11$

$$\begin{array}{r|l} x^2 & 9 \\ \hline K & \end{array}$$

⇒ **K = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

4. $A < 3500$,

$$\begin{array}{r|l} A & 5 \\ \hline 0 & \end{array} \quad , \quad \begin{array}{r|l} A & 7 \\ \hline 0 & \end{array} \quad , \quad \begin{array}{r|l} A & 9 \\ \hline 0 & \end{array}$$

⇒ **max(A) = ?**

A) 3400 B) 3455 C) 3465 D) 3470 E) 3475

5. $x, y \in Z^+$,

$x \cdot y^2 = y^2 + 36$

⇒ **Σx = ?**

A) 15 B) 42 C) 47 D) 49 E) 54

6. $n \in N^+$

aşağıdakilerden hangisi daima çifttir?

Which of the following is always even?

A) $n^2 - n$ B) $2n + 3n^2$ C) $4^n + 5^n$ D) $n^2 + n + 7$ E) n^4

7. $A = 3 \cdot 8 + 4 \cdot 9 + 5 \cdot 10 + \ldots + 13 \cdot 18$

$B = 2 \cdot 8 + 3 \cdot 9 + 4 \cdot 10 + \ldots + 12 \cdot 18$

⇒ **A − B = ?**

A) 140 B) 143 C) 145 D) 147 E) 149

8. $x + y = 17$

$$\begin{array}{r|l} ABC & AB \\ \hline - & x \\ \hline y & \end{array} \qquad \begin{array}{r|l} ABC & 5 \\ \hline - & \\ \hline z & \end{array}$$

⇒ **z = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

9. $a > 0,\ b < 0,$

$a^2b - c^2 > abc$

aşağıdakilerden hangisi doğrudur?
Which of the following is true?

A) $a - c < 0$ B) $a - c > 0$ C) $a \,.\, b \,.\, c = 0$

D) $\frac{a}{b} + a - c > 0$ E) $a^2 + b^2 + a < 0$

10. $1,\overline{9} + 2,\overline{9} + 3,\overline{9} + \ldots + 29,\overline{9} = ?$

A) 465 B) 464 C) 460 D) 457 E) 456

11. $10 \,.\, 20 \,.\, 30 \,.\, \ldots \,.\, 1100 = A$

$\frac{A}{B!} \in Z$

$\Rightarrow$ **max(B) = ?**

A) 1100 B) 1000 C) 770 D) 550 E) 110

12. $x, A \in Z^+$

$A = \frac{4x + 19}{x + 2} \in Z$

$\Rightarrow$ **max(x) = ?**

A) 11 B) 10 C) 9 D) 2 E) 1

13. $\frac{2}{3} + \frac{4}{5} + \frac{4}{3} + \frac{6}{5} + \ldots + \frac{22}{3} + \frac{24}{5} = ?$

A) $\frac{378}{5}$ B) $\frac{377}{5}$ C) $\frac{376}{5}$ D) $\frac{375}{5}$ E) $\frac{374}{5}$

14. $\frac{1,1 + 1,2 + 1,3 + \ldots + 2}{0,1 + 0,2 + \ldots + 1} = ?$

A) $\frac{31}{11}$ B) $\frac{32}{11}$ C) 3 D) $\frac{34}{11}$ E) $\frac{35}{11}$

15. $\frac{n-3}{n} + \frac{n-2}{n} + \frac{n-1}{n} + \ldots + \frac{n+7}{n} = 12$

$\Rightarrow$ $1 + 2 + 3 + \ldots n = ?$

A) 260 B) 253 C) 231 D) 210 E) 189

16. $x \in Z,\ A \in Z^+$

$A = \frac{2x + 21}{x + 3}$

$\Rightarrow$ $\Sigma x = ?$

A) 14 B) 12 C) 0 D) −6 E) −18

1-C 2-B 3-A 4-C 5-E 6-A 7-B 8-C 9-A 10-B 11-E 12-C 13-E 14-A 15-B 16-D

ÜNİTE 11

Unit 11

Oran - Orantı / Ratio and Proportion

1. $\frac{x}{y} = \frac{3}{7}$

$x + y = 30$

$\Rightarrow$ **x = ?**

A) 9 B) 10 C) 11 D) 12 E) 14

2. $\frac{x}{y} = \frac{4}{5}$

$2x - y = 12$

$\Rightarrow$ **x + y = ?**

A) 48 B) 36 C) 32 D) 28 E) 24

3. $\frac{x}{4} = \frac{y}{3}$

$2x + 3y = 34$

$\Rightarrow$ **x − y = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

4. $\frac{x}{0,2} = \frac{y}{0,3}$

$x + y = 30$

$\Rightarrow$ **y = ?**

A) 9 B) 12 C) 15 D) 18 E) 19

5. $\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$

$x + y + z = 27$

$\Rightarrow$ **x − y − z = ?**

A) 15 B) 0 C) −3 D) −6 E) −15

6. $\frac{x}{4} = \frac{y}{5} = \frac{z}{7}$

$2x + 3y - 4z = -15$

$\Rightarrow$ **x + y + z = ?**

A) 48 B) 42 C) 38 D) 36 E) 34

7. $(x : y : z) = (4 : 5 : 8)$

$\Rightarrow \frac{x + y}{x - z} = ?$

A) −3 B) $-\frac{9}{4}$ C) −2 D) 2 E) $\frac{9}{4}$

8. $(x : y : z) = (10 : 11 : 12)$

$x + 3y - 4z = -35$

$\Rightarrow$ **x − z = ?**

A) 0 B) −7 C) −14 D) −21 E) −28

9. $2x = 5y$

$x + y = 28$

$\Rightarrow$ **x . y = ?**

A) 180 B) 160 C) 140 D) 120 E) 100

10. $x = 3y$

$x + y = 28$

$\Rightarrow$ **x . y = ?**

A) 180 B) 147 C) 140 D) 120 E) 100

11. $\frac{x}{4} = \frac{y}{3}$

$x + 2y = 30$

$\Rightarrow$ **x·y = ?**

A) 96 B) 100 C) 108 D) 117 E) 126

12. $x = \frac{y}{4}$

$x + y = 30$

$\Rightarrow$ **y = ?**

A) 30 B) 28 C) 25 D) 24 E) 19

13. $3a = 2b$

$b = 5c$

$\Rightarrow \frac{a-b}{b-c} = ?$

A) $\frac{1}{2}$ B) $\frac{5}{12}$ C) $\frac{1}{12}$ D) $-\frac{5}{12}$ E) $-\frac{1}{2}$

14. $2x = 7y$

$3x = 8z$

$\Rightarrow \frac{\frac{1}{x}}{\frac{1}{y}+\frac{1}{z}} = ?$

A) $\frac{1}{37}$ B) $\frac{3}{37}$ C) $\frac{5}{37}$ D) $\frac{6}{37}$ E) $\frac{9}{37}$

15. $5a = 4b = 6c$

$a + b - 2c = 21$

$\Rightarrow \frac{a.b}{c} = ?$

A) 74 B) 70 C) 63 D) 60 E) 54

16. $\frac{1}{a} = \frac{2}{3b} = \frac{1}{4c}$

$2a - b - c = 26$

$\Rightarrow$ **a + b + c = ?**

A) 46 B) 52 C) 59 D) 62 E) 72

1-A 2-B 3-C 4-D 5-E 6-A 7-B 8-C 9-B 10-B 11-C 12-D 13-D 14-D 15-E 16-A

1. $\frac{a}{b} = \frac{3}{4}, \ \frac{b}{c} = \frac{3}{5}$

$a + b + c = 41$

$\Rightarrow$ **a = ?**

A) 9 B) 15 C) 16 D) 18 E) 20

2. $a > 0,$

$\frac{a}{b} = \frac{1}{2}, \ \frac{b}{c} = \frac{4}{3}$

$b \cdot c + a \cdot c = 18$

$\Rightarrow$ **a − b + c = ?**

A) 3 B) 2 C) 1 D) $\frac{1}{2}$ E) $\frac{1}{3}$

3. $\frac{a}{5} = \frac{b}{4}, \ \frac{a}{3} = \frac{c}{10}$

$a + b + c = 154$

$\Rightarrow$ **b = ?**

A) 24 B) −12 C) −18 D) −24 E) −100

4. $\frac{a}{11} = \frac{b}{12}, \ \frac{b}{c} = 3$

$a + b + c = 81$

$\Rightarrow \frac{b^2 - a^2}{c^2} = ?$

A) $\frac{4}{3}$ B) $\frac{23}{16}$ C) 2 D) $\frac{16}{23}$ E) $\frac{15}{23}$

5. $\frac{a}{b} = \frac{1}{2}, \ \frac{b}{c} = \frac{2}{5}$

$a \cdot b \cdot c = 80$

$\Rightarrow a^2 + b^2 + c^2 = ?$

A) 100 B) 104 C) 120 D) 132 E) 136

6. $\frac{a}{b} = \frac{4}{3}, \ \frac{b}{c} = \frac{4}{5}$

$\Rightarrow \frac{a + b}{b + c} = ?$

A) 1 B) $\frac{28}{27}$ C) $\frac{29}{27}$ D) $\frac{10}{9}$ E) $\frac{32}{27}$

7. $\frac{a}{4} = \frac{b}{5}, \ \frac{b}{12} = \frac{c}{11}$

$\Rightarrow \frac{a + b}{b - c} = ?$

A) $\frac{5}{108}$ B) $\frac{16}{7}$ C) $\frac{17}{8}$ D) $\frac{35}{16}$ E) $\frac{108}{5}$

8. $\frac{a}{0,2} = \frac{b}{0,3}, \ \frac{a}{0,4} = \frac{c}{0,7}$

$\Rightarrow \frac{a + b - c}{a + b + c} = ?$

A) $-\frac{3}{17}$ B) $\frac{1}{17}$ C) $\frac{2}{17}$ D) $\frac{3}{17}$ E) $\frac{4}{17}$

9. $\frac{a+b}{a-b} = \frac{1}{4}$

$\Rightarrow \frac{a}{b} = ?$

A) $\frac{5}{3}$ B) $\frac{3}{5}$ C) 0 D) $-\frac{3}{5}$ E) $-\frac{5}{3}$

10. $\frac{a-b}{2a+3b} = -\frac{1}{2}$

$\Rightarrow \frac{a}{b} = ?$

A) $-\frac{1}{4}$ B) 0 C) $\frac{1}{4}$ D) 4 E) 5

11. $\frac{a+2b}{b+2a} = \frac{1}{3}$

$\Rightarrow \frac{a-b}{b+2a} = ?$

A) $-\frac{2}{3}$ B) $-\frac{1}{3}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{3}{2}$

12. $\frac{a-2b+c}{a-b+4c} = 2$

$\Rightarrow \frac{a}{c} = ?$

A) $\frac{4}{7}$ B) $\frac{3}{7}$ C) $\frac{2}{7}$ D) $-\frac{1}{7}$ E) -7

13. $\frac{x-y}{x+y} = \frac{a}{b}$

$\Rightarrow \frac{a+b}{a-b} = ?$

A) $\frac{y}{x}$ B) $\frac{x}{y}$ C) $\frac{x}{y^2}$ D) $-\frac{y}{x}$ E) $-\frac{x}{y}$

14. $\frac{x-2y}{x+2y} = \frac{a}{b}$

$\Rightarrow \frac{a}{a+b} = ?$

A) $\frac{x+2y}{2x}$ B) $\frac{x-2y}{2x}$ C) $\frac{2x-y}{2x}$ D) $\frac{2x+y}{2x}$ E) $\frac{2y-x}{2y}$

15. $\frac{x+y}{3} = \frac{y}{4}$

$\Rightarrow \frac{x-y}{3x+2y} = ?$

A) $-\frac{3}{2}$ B) -1 C) 1 D) $\frac{7}{5}$ E) $\frac{9}{5}$

16. $\frac{x-y}{4} = \frac{x+y}{5}$

$\Rightarrow \frac{x-2y}{x-4y} = ?$

A) $\frac{5}{7}$ B) $\frac{1}{5}$ C) 1 D) $\frac{7}{5}$ E) $\frac{9}{5}$

1-A 2-C 3-A 4-B 5-C 6-B 7-E 8-D 9-E 10-A 11-D 12-E 13-E 14-B 15-B 16-D

1. $a, b, c \in R^+$,

$$\frac{2}{a.b} = \frac{3}{b.c} = \frac{7}{a.c}$$

$\Rightarrow$ **? > ? > ?**

A) c > a > b B) c > b > a C) a > b > c
D) a > c > b E) b > c > a

2. $a, b, c \in R^-$,

$$\frac{a.b}{10} = \frac{b.c}{11} = \frac{a.c}{12}$$

$\Rightarrow$ **? > ? > ?**

A) c > a > b B) b > a > c C) a > b > c
D) a > c > b E) b > c > a

3. $a > 0$,

$$\frac{a.b}{3} = \frac{b.c}{10} = \frac{a.c}{-13}$$

$\Rightarrow$ **? > ? > ?**

A) b > a > c B) a > c > b C) a > b > c
D) c > b > a E) c > a > b

4. $a, b, c \in R^-$,

$$\frac{a}{\sqrt{3}} = \frac{b}{\sqrt{4}} = \frac{c}{\sqrt{5}}$$

$\Rightarrow$ **? > ? > ?**

A) c > b > a B) c > a > b C) b > a > c
D) a > b > c E) a > c > b

5. $a > 0$,

$$\frac{a}{0,2} = \frac{b}{1,4} = \frac{c}{0,7}$$

$\Rightarrow$ **? > ? > ?**

A) a > b > c B) a > c > b C) b > c > a
D) b > a > c E) c > a > b

6. $ab = 4bc = 5ac$

$\Rightarrow$ **(a : b : c) = (? : ? : ?)**

A) 5 : 4 : 1 B) 4 : 5 : 1 C) 4 : 1 : 5
D) 1 : 4 : 5 E) 1 : 5 : 4

7. $4ab = 5bc = 6ac$

$3a - 2b + c = -21$

$\Rightarrow$ **c = ?**

A) −24 B) −21 C) −18 D) −15 E) −12

8. $a > 0$,

$$\frac{a.b}{23} = \frac{b.c}{69} = \frac{a.c}{46}$$

$a.b.c = 108$

$\Rightarrow$ **a^3 = ?**

A) 15 B) 16 C) 18 D) 24 E) 36

9. $x = 3y = 4z$

$x + y + z = 19$

$\Rightarrow$ $\mathbf{x + y = ?}$

A) 13 B) 16 C) 17 D) 18 E) 19

10. $2x = 5y = 6z$

$x + y + z = 52$

$\Rightarrow$ $\mathbf{y + z = ?}$

A) 44 B) 38 C) 35 D) 33 E) 22

11. $4x = 5y = 10z$

$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{19}{4}$

$\Rightarrow$ $\mathbf{x + z = ?}$

A) $\frac{1}{7}$ B) 1 C) $\frac{3}{2}$ D) $\frac{7}{5}$ E) $\frac{15}{4}$

12. $x = 3y = 13z$

$-\frac{1}{x} - \frac{1}{y} + \frac{1}{z} = 18$

$\Rightarrow$ $\mathbf{y + z = ?}$

A) $\frac{8}{39}$ B) $\frac{7}{39}$ C) $\frac{5}{39}$ D) $\frac{2}{39}$ E) $\frac{1}{39}$

13. $ax = by = cz = 14$

$a + b + c = 2$

$\Rightarrow$ $\mathbf{\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = ?}$

A) $\frac{1}{9}$ B) $\frac{1}{7}$ C) $\frac{1}{2}$ D) 7 E) 14

14. $ax = by = cz = 13$

$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 4$

$\Rightarrow$ $\mathbf{x + y + z = ?}$

A) 28 B) 42 C) 52 D) $52\frac{1}{4}$ E) $52\frac{1}{2}$

15. $ax = 2by = 3cz = 15$

$x + 2y + 3z = 3$

$\Rightarrow$ $\mathbf{\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = ?}$

A) $\frac{1}{19}$ B) $\frac{1}{15}$ C) $\frac{1}{5}$ D) $\frac{1}{3}$ E) 15

16. $ax = 4by = 5cz = 18$

$x + y + z = 2$

$\Rightarrow$ $\mathbf{\frac{1}{a} + \frac{1}{4b} + \frac{1}{5c} = ?}$

A) 18 B) 9 C) 2 D) $\frac{1}{2}$ E) $\frac{1}{9}$

1-A 2-B 3-E 4-D 5-C 6-B 7-E 8-D 9-B 10-E 11-D 12-A 13-B 14-C 15-C 16-E

1. $a + \frac{1}{b} = 5$

$b + \frac{1}{a} = 4$

$\Rightarrow \frac{a}{b} = ?$

A) $\frac{5}{4}$ B) 1 C) $\frac{4}{5}$ D) $\frac{3}{5}$ E) $\frac{2}{5}$

2. $3a + \frac{2}{b} = 7$

$3b + \frac{2}{a} = 5$

$\Rightarrow \frac{a+b}{a-b} = ?$

A) 7 B) 6 C) $\frac{7}{12}$ D) $\frac{5}{12}$ E) $\frac{1}{12}$

3. $2y - \frac{5}{3x} = 7$

$3x - \frac{5}{2y} = 12$

$\Rightarrow \frac{x-y}{x+y} = ?$

A) 9 B) $\frac{5}{4}$ C) $\frac{4}{5}$ D) $\frac{1}{15}$ E) $-\frac{1}{18}$

4. $a, b \in R^+$,

$a^2 + \frac{4}{b^2} = 16$

$b^2 + \frac{4}{a^2} = 25$

$\Rightarrow \frac{a+b}{a-b} = ?$

A) 9 B) $\frac{5}{4}$ C) $\frac{4}{5}$ D) -9 E) -19

5. $a + \frac{m}{3b} = 4$

$3b + \frac{m}{a} = 9$

$\Rightarrow \frac{a}{b} = ?$

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{3}{4}$ D) 1 E) $\frac{4}{3}$

6. $x + \frac{a^2 - b^2}{y} = 13$

$y + \frac{a^2 - b^2}{x} = 2$

$\Rightarrow \frac{x}{x+y} = ?$

A) $\frac{15}{13}$ B) 1 C) $\frac{13}{15}$ D) $\frac{12}{7}$ E) $\frac{1}{7}$

7. $a + \frac{3x}{b} = 4$

$b + \frac{3x}{a} = 1$

$\Rightarrow \frac{a^2}{b^2} - \frac{b^2}{a^2} = ?$

A) $\frac{15}{4}$ B) $\frac{48}{7}$ C) $\frac{120}{11}$ D) $\frac{243}{16}$ E) $\frac{255}{16}$

8. $x + \frac{m+n}{2y} = 11$

$2y + \frac{m+n}{x} = 9$

$\Rightarrow \frac{x}{y} = ?$

A) $\frac{9}{22}$ B) $\frac{6}{11}$ C) 1 D) $\frac{19}{9}$ E) $\frac{22}{9}$

9. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{1}{2}$

$\Rightarrow \frac{a.d.e}{b.c.f} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 2 D) 4 E) 8

10. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{2}{5}$

$\Rightarrow \frac{b^2.c.e}{a^2.d.f} = ?$

A) $\frac{4}{25}$ B) $\frac{2}{5}$ C) 1 D) $\frac{5}{2}$ E) $\frac{25}{4}$

11. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = k$

$\Rightarrow \frac{a^2.d^2.f^3}{b^2.c^2.e^3} = ?$

A) $\frac{1}{k}$ B) $\frac{1}{k^2}$ C) $\frac{1}{k^3}$ D) k E) k^2

12. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{4k}{5}$

$\Rightarrow \frac{a.d^2.e}{b.c^2.f} = ?$

A) $\frac{125}{64k^3}$ B) $\frac{25}{16k^2}$ C) $\frac{5}{4k}$ D) 1 E) $\frac{4k}{5}$

13. $\frac{a}{b} = \frac{c}{d} = 4$

$\Rightarrow \frac{2a + 3c}{2b + 3d} = ?$

A) 1 B) 2 C) 3 D) 4 E) $\frac{17}{4}$

14. $\frac{a}{b} = \frac{c}{d} = k$

$\Rightarrow \frac{3a - 8c}{3b - 8d} = ?$

A) k^3 B) k^2 C) $-k^2$ D) $-k$ E) k

15. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = 5$

$a + c + e = 10$

$\Rightarrow b + d + f = ?$

A) 15 B) 10 C) 5 D) 2 E) $\frac{1}{2}$

16. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{1}{2}$

$a + 2c + 3e = 12$

$b + 2d = 8$

$\Rightarrow f = ?$

A) $\frac{16}{3}$ B) $\frac{22}{3}$ C) $\frac{24}{3}$ D) $\frac{26}{3}$ E) $\frac{28}{3}$

1-A 2-B 3-D 4-D 5-E 6-C 7-E 8-E 9-B 10-C 11-C 12-D 13-D 14-E 15-D 16-A

1. $\frac{x}{x-3} = \frac{y}{y+5} = \frac{z}{z+6} = \frac{1}{2}$

$\Rightarrow$ $x + y + z = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

2. $\frac{x}{y} = \frac{1}{3}$

$\Rightarrow$ $\frac{3x}{y} + \frac{4y}{x} = ?$

A) 12 B) 13 C) $13\frac{1}{3}$ D) $13\frac{1}{2}$ E) $14\frac{1}{3}$

3. $m + \frac{4}{n} = 7$

$n + \frac{4}{m} = 14$

$\Rightarrow$ $\frac{2m + n}{3m - n} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

4. $m^2 + \frac{2}{n} = 3$

$n + \frac{n}{m^2} = 2$

$\Rightarrow$ $\frac{m^2}{n} - \frac{n}{m^2} = ?$

A) $\frac{3}{2}$ B) $\frac{4}{3}$ C) $\frac{7}{6}$ D) 1 E) $\frac{5}{6}$

5. $\frac{x+y}{4} = \frac{x-z}{2} = \frac{y}{5} = 1$

$\Rightarrow$ $x + y + z = ?$

A) -1 B) 0 C) 1 D) 2 E) 3

6. $x = \frac{70y}{100}$, $y = \frac{20z}{100}$, $z = 100kx$

$\Rightarrow$ $k = ?$

A) $\frac{1}{77}$ B) $\frac{1}{70}$ C) $\frac{1}{14}$ D) 14 E) 70

7. $\frac{4}{3}x = \frac{5}{4}y$

$\frac{2y}{3} = \frac{4z}{5}$

$\frac{3x}{2} = k \cdot \frac{4z}{3}$

$\Rightarrow$ $\sqrt{k} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) $\frac{9}{8}$ E) $\frac{4}{3}$

8. $\frac{x}{2} = \frac{y+4}{3} = \frac{z}{5}$

$2x - y = 6$

$\Rightarrow$ $z = ?$

A) 8 B) 10 C) 12 D) 14 E) 16

9. $\frac{a}{b} = \frac{2}{3}$, $\frac{b}{c} = \frac{2}{5}$

$\Rightarrow \frac{a-b}{b-c} = ?$

A) $\frac{9}{2}$ B) 3 C) 2 D) $\frac{1}{3}$ E) $\frac{2}{9}$

10. $\frac{a}{b} = \frac{4}{3}$

$a + b = \frac{14}{3}$

$\Rightarrow a = ?$

A) $\frac{4}{3}$ B) $\frac{5}{3}$ C) 2 D) $\frac{7}{3}$ E) $\frac{8}{3}$

11. $a < 0$

$\frac{a}{5} = \frac{b}{4} = 2c$

$\Rightarrow ? > ? > ?$

A) $c > a > b$ B) $c > b > a$ C) $a > b > c$ D) $a > c > b$ E) $b > c > a$

12. $b + \frac{1}{3a} = 10$

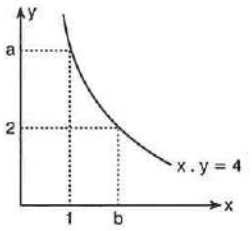
$3a + \frac{1}{b} = 4$

$\frac{a}{b} = \frac{k}{15}$

$\Rightarrow k = ?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 2 D) 3 E) 4

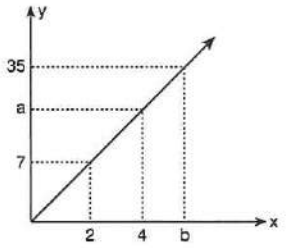
13.



$\Rightarrow a \cdot b = ?$

A) 16 B) 8 C) 4 D) 2 E) 1

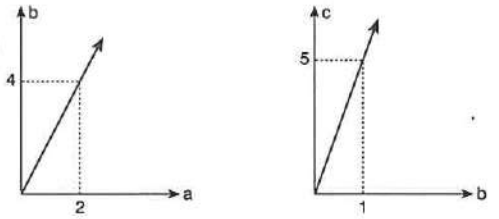
14.



$\Rightarrow (a + b) = ?$

A) 24 B) 28 C) 34 D) 36 E) 38

15. $a, b, c \in Z^+$,



$\Rightarrow \min(a + b + c) = ?$

A) 28 B) 27 C) 26 D) 13 E) 7

16. $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = k$

$\Rightarrow \frac{a+d}{c+d} = ?$

A) $k + 1$ B) $k - 1$ C) k D) $k^2 - k + 1$ E) $k^2 + k + 1$

1-B 2-B 3-E 4-E 5-C 6-C 7-D 8-B 9-E 10-E 11-B 12-C 13-B 14-A 15-D 16-D

1. $a, b, c \in R^+$

$$\frac{a+b}{c+3} = \frac{b}{c}$$

$$\frac{a}{c} = b$$

$\Rightarrow$ **c = ?**

A) $\sqrt{3}$ B) $\sqrt{2}$ C) 1 D) $\frac{1}{\sqrt{3}}$ E) $\frac{1}{\sqrt{2}}$

2. $$\frac{a+b}{4} = \frac{c}{3}$$

$$\frac{a}{2} = \frac{c}{5}$$

$\Rightarrow$ $\frac{a}{b}$ **= ?**

A) $\frac{7}{3}$ B) 2 C) $\frac{5}{3}$ D) $\frac{2}{7}$ E) $\frac{3}{7}$

3. $a = \frac{x+y}{x-y}$, $b = \frac{y-z}{z+y}$

$\Rightarrow$ $\frac{1-a}{1+b}$ **= ?**

A) $\frac{z+y}{x-y}$ B) $\frac{z+y}{y-x}$ C) $\frac{x-y}{z+y}$ D) $\frac{x+y}{z-y}$ E) $\frac{x+y}{y-z}$

4. $a, b, c, d \in Z^+$

$$\frac{a}{b} : \frac{4}{11} = c$$

$$\frac{33}{22} : \frac{b}{a} = d$$

$\Rightarrow$ **min(c + d) = ?**

A) 5 B) 6 C) 9 D) 11 E) 17

5. $$\frac{2a+b}{2a+3b} = \frac{1}{2}$$

$\Rightarrow$ $\frac{2ab - a^2}{a^2 + b^2}$ **= ?**

A) 1 B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) $\frac{5}{3}$

6. $$-\frac{2}{a} = \frac{b}{3} = c$$

$$a + b + c = 0$$

$\Rightarrow$ c^2 **= ?**

A) 6 B) 4 C) 2 D) $\frac{1}{2}$ E) $\frac{1}{4}$

7. $b = 3a$

$c = 2b$

$d = 4c$

$a + b + c + d = 68$

$\Rightarrow$ **a + b = ?**

A) 50 B) 48 C) 24 D) 12 E) 8

8. $a, b \in Z^+$, $b < 50$

$$\frac{a}{b} = \frac{4}{7}$$

$\Rightarrow$ Σa **= ?**

A) 110 B) 112 C) 114 D) 116 E) 118

9. $\frac{a}{b} = \frac{c}{d} = k$

$\frac{2a + 4c}{2b + nd} = k$

$\Rightarrow$ **n = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

10. $\frac{a}{b} = \frac{c}{d} = k$

$\frac{3a - nc}{ma + 7d} = k$

$\Rightarrow$ **(m . n) = ?**

A) 21 B) 7 C) 3 D) −7 E) −21

11. $\frac{a}{b} = \frac{c}{d} = 4$

$\Rightarrow \frac{2a + 2c + b + d}{b + d} = ?$

A) 2 B) 4 C) 8 D) 9 E) 10

12. $\frac{a}{b} = \frac{2}{3}$

$a^3 + b^3 = 280$

$\Rightarrow$ **a − b = ?**

A) −2 B) −1 C) 0 D) 2 E) 8

13. $\frac{a}{3} = \frac{b}{4}$

$\frac{b}{2} = \frac{c}{5}$

$\Rightarrow \frac{a + 2b}{c} \cdot \frac{b - 2c}{a} = ?$

A) $-\frac{33}{8}$ B) $-\frac{88}{15}$ C) $-\frac{55}{24}$ D) $\frac{55}{24}$ E) $\frac{88}{15}$

14. $k > 0$

$\frac{a}{16} = \frac{b}{20} = \frac{c}{9} = k^2$

$\Rightarrow \sqrt{a + b} + \sqrt{a + c} + \sqrt{b - a} = ?$

A) 7k B) 9k C) 13k D) 15k E) 17k

15. $\frac{a}{4} = \frac{b}{3} = \frac{a + 2b}{c}$

$\Rightarrow$ **c = ?**

A) 10 B) 8 C) 7 D) 4 E) 3

16. $\frac{x + y}{4} = \frac{y + z}{7} = \frac{z + x}{9}$

$\Rightarrow$ **(x : y : z) = (? : ? : ?)**

A) 6 : 3 : 1 B) 1 : 6 : 3 C) 1 : 3 : 6 D) 3 : 6 : 1 E) 3 : 1 : 6

1-A 2-E 3-B 4-E 5-C 6-D 7-E 8-B 9-B 10-E 11-D 12-A 13-B 14-C 15-A 16-E

ÜNİTE 12

Unit 12

Kümeler / Sets

1. $A = \{0, 1, \{1\}, 2, \{1, 2\}\}$

Aşağıdaki gösterimlerden hangisi doğrudur?
Which of the following is true?

A) $\{0, 1\} \in A$
B) $\{1, 2\} \in A$
C) $\{0, 1, 2\} \in A$
D) $\{0, \{1\}\} \in A$
E) $\{1, 2\} \notin A$

2. $A = \{a, b, c, \{a, b\}, \{c\}, \{a, b, c\}\}$

Aşağıdaki gösterimlerden hangisi yanlıştır?
Which of the following is false?

A) $a \in A$
B) $\{c\} \in A$
C) $\{\{b, c\}\} \subset A$
D) $\{a, b\} \subset A$
E) $\{a, b\} \in A$

3. $A = \{a, b, \{a, b\}, \{a, b, c\}\}$

I. $a \in A$
II. $\{a, b\} \in A$
III. $\{a, b\} \subset A$
IV. $n(A) = 4$
V. $c \in A$

ifadelerinden kaç tanesi doğrudur?
How many of the statements are true?

A) 1
B) 2
C) 3
D) 4
E) 5

4. $A = \{x \mid x \in Z,\ -2 \le x \le 4\}$

I. $3, 4 \in A$
II. $\{3, 4\} \subset A$
III. $0 \in A$
IV. $\{0\} \subset A$
V. $n(A) = 7$
VI. $-4 \in A$

ifadelerinden kaç tanesi doğrudur?
How many of the statements are true?

A) 6
B) 5
C) 4
D) 3
E) 2

5. $A = \{x \mid x \in Z,\ x^2 < 25\}$

aşağıdaki gösterimlerden hangisi doğrudur?
Which of the following is true?

A) $n(A) = 9$
B) $\{-5, -4, -3, -2, -1\} \subset A$
C) $\{1, 2, 3, 4, 5\} \subset A$
D) $4, 5 \in A$
E) $0 \notin A$

6. $A = \{x \mid x \in Z^+,\ x = 2n,\ n \in Z,\ x \le 10\}$

I. $n(A) = 10$
II. $\{1, 2, 3\} \subset A$
III. $5 \in A$
IV. $\{2, 4, 6, 8\} \subset A$
V. $n(A) = 5$
VI. $\{2, 4\} \subset A$

ifadelerinden kaç tanesi doğrudur?
How many of the statements are true?

A) 6
B) 5
C) 4
D) 3
E) 2

7. $A = \{x \mid x \in N,\ x = 5n,\ x < 30\}$

aşağıdaki gösterimlerden hangisi doğrudur?
Which of the following is true?

A) $n(A) = 6$
B) $n(A) = 5$
C) $\{0, 5, 10\} \in A$
D) $\{5, 15, 25\} \in A$
E) $0 \notin A$

8. $A = \{a, b, \{a, b\}, c, \{c\}, \{a, b, c\}\}$

olduğuna göre, aşağıdakilerden hangisi doğrudur?
Accordingly, which of the following is true?

A) $n(A) = 9$
B) $\{a, c\} \in A$
C) $\{b, c\} \in A$
D) $\{a, b, \{a, c\}\} \subset A$
E) $\{a, b, c\} \subset A$

9. $A = \{2, 3, 4, 5, 6\}$

A kümesinin kaç tane alt kümesi vardır?
How many subsets of set A are there?

A) 5 B) 6 C) 12 D) 32 E) 64

10. $A = \{a, b, c, d, e, f\}$

A kümesinin 3 elemanlı alt kümelerinin sayısı kaçtır?
How many 3 element subsets does the set A have?

A) 15 B) 20 C) 25 D) 32 E) 64

11. $A = \{a, b, c, d, e, f\}$

A kümesinin 3 elemanlı alt kümelerinin kaç tanesinde a eleman olarak bulunur?
How many of 3 element subsets of set A have a as an element?

A) 25 B) 20 C) 15 D) 12 E) 10

12. $A = \{x \mid -1 < x \leq 4,\ x \in Z\}$

A kümesinin alt küme sayısı kaçtır?
How many subsets of set A are there?

A) 32 B) 36 C) 44 D) 48 E) 64

13. $A = \{a, b, c, d, e, f\}$

A kümesinin 4 elemanlı alt kümelerinin kaç tanesinde a ve c bulunur?

How many of 4 element subsets of set A dont have a and c as an element?

A) 2 B) 4 C) 6 D) 8 E) 10

14. $A = \{a, b, c, d, e\}$

A kümesinin 3 elemanlı alt kümelerinin kaç tanesinde a vardır, c yoktur?

How many of 3 element subsets of set A have a and don't have c as an element?

A) 2 B) 3 C) 4 D) 5 E) 6

15. $A = \{a, b, c, d, e\}$

A kümesinin 4 elemanlı alt kümelerinin kaç tanesinde a eleman olarak bulunmaz?

How many of 4 element subsets of set A don't have a as an element?

A) 1 B) 2 C) 3 D) 4 E) 5

1-B 2-C 3-D 4-B 5-A 6-D 7-A 8-E 9-D 10-B 11-E 12-A 13-C 14-B 15-A

1. $A = \{a, b, c\}$

$B = \{1, 2\}$

$\Rightarrow$ **$A \cup B = ?$**

A) $\varnothing$ B) $\{a, b, c\}$ C) $\{1, 2\}$ D) $\{a, b, c, 1, 2\}$ E) $\{a, 1\}$

2. $A = \{a, b, c, 1\}$

$B = \{1, 2\}$

$\Rightarrow$ **$A \cup B = ?$**

A) $\{a, b, c, 1, 2\}$ B) $\varnothing$ C) $\{a, c, 2\}$ D) $\{a, b, c, 1\}$ E) $\{1, 2, a, b\}$

3. $A = \{1, 2, 3, 4, 5\}$

$B = \{0, 2, 4\}$

$\Rightarrow$ **$A \cup B = ?$**

A) $\{0, 1, 2, 3, 4\}$ B) $\{0, 1, 2, 3, 4, 5\}$ C) $\{0, 2, 4\}$ D) $\{1, 3, 5\}$ E) $\{0, 1, 3, 5\}$

4. $A = \{a, b, c, d, e\}$

$B = \{a, e\}$

$\Rightarrow$ **$A \cup B = ?$**

A) $\{a, b, e\}$ B) $\{a, e\}$ C) $\{a, b, c, d, e\}$ D) $\{b, c, d\}$ E) $\{a, c, e\}$

5. $A = \{x \mid 1 \le x \le 7,\ x \in Z\}$

$B = \{y \mid 0 < y < 4,\ y \in Z\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

A) 11 B) 10 C) 9 D) 8 E) 7

6. $A = \{x \mid -2 < x \le 4,\ x \in R\}$

$B = \{y \mid -1 < y < 3,\ y \in R\}$

$\Rightarrow$ **$A \cup B = ?$**

A) $(-2, 4]$ B) $(-2, 4)$ C) $(-2, 3]$ D) $[-2, 2]$ E) $(-2, 3)$

7. $A = \{x \mid -2 \le x < 3,\ x \in R\}$

$B = \{y \mid -3 \le y \le 4,\ y \in Z\}$

$\Rightarrow$ **$A \cup B = ?$**

A) $[-2, 3] \cup \{-3, 4\}$

B) $[-2, 3)$

C) $[-2, 4]$

D) $\{-3, -2, -1, 0, 1, 2, 3, 4\}$

E) $\{-3, -2, -1, 0, 1, 2, 3\}$

8. $A = \{1, 2, \{1, 2\}\}$

$B = \{\{1\}, \{2\}, \{1, 2\}\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

A) 6 B) 5 C) 4 D) 3 E) 2

9. $A = \{\ldots -4, -3, -2, -1, 0, 1, 2, 3, 4, \ldots\}$

$B = \{0, 1, 2, 3, \ldots\}$

$\Rightarrow$ **$A \cap B = ?$**

A) Z^- B) Z^+ C) N D) N^+ E) R

10. $A = \{a, b, c\}$

$B = \{a, b, e\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $\varnothing$ B) $\{a, b, c, e\}$ C) $\{a, b\}$ D) $\{c\}$ E) $\{e\}$

11. $A = \{a, b, \{c\}, \{a, b\}, \{a, b, c\}\}$

$B = \{a, \{c\}, \{a, c\}, \{b\}\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 6 B) 5 C) 4 D) 3 E) 2

12. $A = \{x \mid x \in Z, \ -6 < x < 2\}$

$B = \{y \mid y \in Z, \ -4 < y < 3\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

13. $A = \{x \mid x \in R, \ -3 \le x < 4\}$

$B = \{y \mid y \in R, \ -1 \le y \le 5\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $[-3, 5]$ B) $[-3, 5)$ C) $(-3, 5)$ D) $[-1, 4)$ E) $[-1, 4]$

14. $A = \{a, b, c, d, e\}$

$B = \{1, 2, 3\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $\varnothing$ B) $\{a, b, c, d, e, 1, 2, 3\}$ C) $\{a, b, c, d, e\}$ D) $\{1, 2, 3\}$ E) $\{a, 1, b, 2, c\}$

15. $A = \{x \mid x \in R, \ -11 < x < 10\}$

$B = \{y \mid y \in Z^+, \ 4 < y < 23\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $\{1, 2, 3, \ldots 10\}$ B) $\{1, 2, 3, \ldots 22\}$ C) $\{1, 2, 3, \ldots 9\}$ D) $\{5, 6, 7, 8, 9\}$ E) $\{5, 6, 7, 8, 9, 10, \ldots 23\}$

1-D 2-A 3-B 4-C 5-E 6-A 7-A 8-B 9-C 10-C 11-E 12-B 13-D 14-A 15-D

1. $A = \{a, b, c\}$

$B = \{d, e, c\}$

$\Rightarrow$ **$A \setminus B = ?$**

A) $\{a\}$ B) $\{b\}$ C) $\{c\}$ D) $\{a, b\}$ E) $\{d, e\}$

2. $A = \{a, b, c, d\}$

$B = \{a, b, e\}$

$\Rightarrow$ **$n(A \setminus B) + n(B \setminus A) = ?$**

A) 7 B) 6 C) 5 D) 4 E) 3

3. $A = \{-10, -9, \ldots -2, -1, 0, 1, 2, \ldots 10\}$

$B = \{x \mid x \in Z,\ x = 2n\}$

$\Rightarrow$ **$n(A \cap B') = ?$**

A) 21 B) 20 C) 10 D) 5 E) 0

4. $A = \{x \mid x \in R,\ -3 < x < 1\}$

$B = \{y \mid y \in Z,\ 0 < x < 4\}$

$\Rightarrow$ **$A \setminus B = ?$**

A) $(-3, 1)$ B) $(0, 4)$ C) $(1, 4)$ D) $[0, 4)$ E) $\varnothing$

5. $A = \{x \mid x \in Z,\ x \geq 10\}$

$B = \{y \mid y \in Z,\ y \leq 5\}$

$\Rightarrow$ **$B \setminus A = ?$**

A) $(10, \infty)$ B) $[10, \infty)$ C) $[5, 10]$ D) $(-\infty, 5)$ E) $(-\infty, 5]$

6. $A = \{x \mid x \in Z^+,\ x < 20\}$

$B = \{y \mid y \in R,\ -4 < y \leq 1\}$

$\Rightarrow$ **$A \setminus B = ?$**

A) $(-4, 0)$ B) $\{2, 3, 4, \ldots 19\}$ C) $(0, 1]$ D) $\{1, 2, 3, \ldots 20\}$ E) $\{-3, -2, -1, 0, 1\}$

7. $A = \{x \mid x \in Z^+,\ x \leq 20\}$

$B = \{y \mid y \in R,\ -4 \leq y \leq 1\}$

$\Rightarrow$ **$B \setminus A = ?$**

A) $[-4, 1)$ B) $[-4, 1]$ C) $[-4, 0]$ D) $\{1, 2, 3, \ldots 20\}$ E) $\{2, 3, 4, \ldots 19\}$

8. $A = \{a, b, c\}$

$B = \{a, b, e, c, d\}$

$\Rightarrow$ **$B \cap A' = ?$**

A) $\{a, b, c\}$ B) $\{a, b, c, d, e\}$ C) $\{a, e\}$ D) $\{a, b, e\}$ E) $\{e, d\}$

9. $A, A' \subset U$

$A = \{1, 2\}$

$A' = \{3, 4\}$

$\Rightarrow$ **U = ?**

A) $\{1, 2\}$ B) $\{3, 4\}$ C) $\{1, 2, 3, 4\}$ D) $\varnothing$ E) $\{1, 3\}$

10. $U = \{a, b, c, d, e\}$

$A = \{a, e\}$

$\Rightarrow$ **A' = ?**

A) $\{a, e\}$ B) $\{b, c, d\}$ C) $\{a, e, d\}$ D) $\{a, c, e\}$ E) $\{a, c, d, e\}$

11. $A \subset U$, $B \subset U$

$n(A) + n(B') = 12$

$n(A') + n(B) = 8$

$n(A) = 2$

$\Rightarrow$ **$n(A')$ = ?**

A) 10 B) 8 C) 7 D) 5 E) 3

12. $A, A' \subset U$,

$n(A) = 5$

$n(U) = 7$

$\Rightarrow$ **$n(A')$ = ?**

A) 2 B) 3 C) 5 D) 6 E) 7

13. $A, B \subset U$,

$n(A \setminus B) = 3$

$n(B \setminus A) = 4$

$n(A \cap B) = 2$

$n(U) = 10$

$\Rightarrow$ **$n[(A \cup B)'] = ?$**

A) 4 B) 3 C) 2 D) 1 E) 0

14. $A, B \subset U$,

$n(U) = 20$

$n(A) = 13$

$n(B) = 12$

$n[(A \cup B)'] = 7$

$\Rightarrow$ **$n(A \cap B)' = ?$**

A) 9 B) 8 C) 7 D) 6 E) 5

15. $A, B \subset U$,

$n(A \setminus B) = 2$

$n(B \cap A') = 3$

$n(A \cap B) = 4$

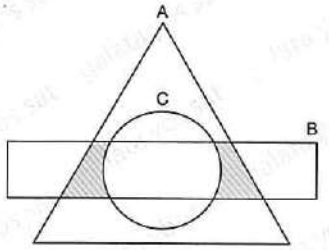
$n[(A \cup B)'] = 5$

$\Rightarrow$ **$n(U)$ = ?**

A) 8 B) 9 C) 12 D) 14 E) 15

1-D 2-E 3-C 4-A 5-E 6-B 7-A 8-E 9-C 10-B 11-B 12-A 13-D 14-B 15-D

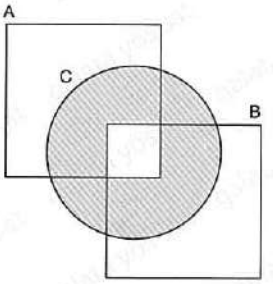
1.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $C \setminus (A \cup B')$
B) $(A \setminus C) \cup B$
C) $A \cap B \cap C$
D) $A \cap B' \cap C$
E) $(A \cap B) \setminus C$

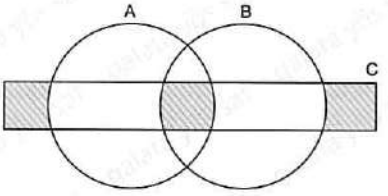
2.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $(A \setminus C) \cup (A \setminus B)$
B) $(A \cap C) \cup B$
C) $(A \cup B) \cap C$
D) $C \setminus (A \cap B)$
E) $(C \cap B) \cap (C \cap A)$

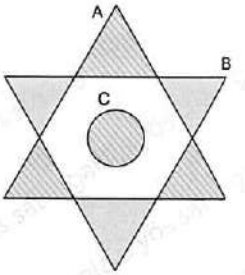
3.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $[C \setminus (A \cup B)] \cup (A \cap B \cap C)$
B) $C \cup (A \cup B)$
C) $(A \setminus B) \cup (B \setminus A)$
D) $(C \setminus B) \cup (C \setminus A)$
E) $(A \cup B \cup C) - (A \cap B)$

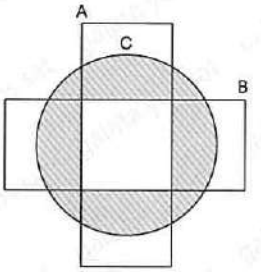
4.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $C \setminus (A \cup B)$
B) $[(A \cup B) \setminus (A \cap B)] \cup (A \cap B \cap C)$
C) $(A \setminus B) \cup (B \setminus A)$
D) $(C \setminus B) \cup (C \setminus A) \cup C$
E) $(A \cup B \cup C) \setminus C$

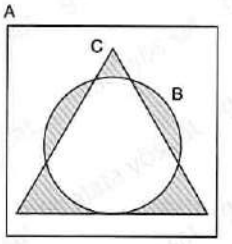
5.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $C \cap (A \cup B)$
B) $C \setminus (A \cap B)$
C) $(A \setminus C) \cup (B \setminus C)$
D) $C \cap (A \cup B)$
E) $C \cup (A \cap B)$

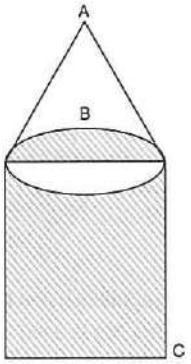
6.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $[A \setminus (B \cap C)] \cup C$
B) $(B \cap C) \setminus A$
C) $(B \cup C) \setminus (B \cap C)$
D) $A \setminus (B \cup C)$
E) $(B \cap C) \setminus A$

7.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $(C \setminus B) \cup (A \cap B)$
B) $B \cap (A \cup C)$
C) $(A \cup B) \setminus C$
D) $(A \cap B) \setminus C$
E) $(C \setminus B) \cap (B \setminus A)$

8. $A = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$
$B = \{2, 4, 6, 7\}$
$C = \{5, 6, 7, 8\}$

$\Rightarrow$ **$(A \setminus B) \cap (A \setminus C) = ?$**

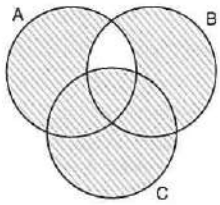
A) $\{0, 1, 3, 9\}$
B) $\{0, 1, 3, 8, 9\}$
C) $\{0, 1, 2, 3\}$
D) $\{0, 1, 3, 4\}$
E) $\{0, 1, 8, 9\}$

9. $A = \{1, 2, 3, 4, 5\}$
$B = \{1, 2, 6\}$
$C = \{2, 3, 7\}$

$\Rightarrow$ **$(A \cap B) \cup C = ?$**

A) $\{3, 4, 5, 6\}$
B) $\{2, 3, 5, 6\}$
C) $\{3, 4, 5, 7\}$
D) $\{1, 2, 3, 4\}$
E) $\{1, 2, 3, 7\}$

10.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $[(A \cup B) \setminus C] \cup C$
B) $[(A \cup B \cup C) \setminus (A \cap B)] \setminus (A \cap B \cap C)$
C) $(B \cup C) \setminus (A \setminus B)$
D) $(A \cup C) \cap (A \cap B)$
E) $[(A \cup B \cup C) \setminus (A \cap B)] \cup (A \cap B \cap C)$

11. $A = \{\square, \bigstar, \bigcirc, \bullet, \heartsuit\}$
$B = \{\square, \blacksquare, \bullet\}$
$C = \{\bigstar, \bullet, \heartsuit, \diamond, \triangle\}$

$\Rightarrow$ **$(A \cap B) \setminus C = ?$**

A) $\{\square, \blacksquare, \bigcirc, \bullet\}$
B) $\{\square, \bigstar, \bullet\}$
C) $\{\square\}$
D) $\{\heartsuit, \diamond, \triangle\}$
E) $\{\bullet, \bullet, \blacksquare\}$

12. $A = \{M, A, T, E, İ, K\}$
$B = \{K, Ü, M, E\}$

$\Rightarrow$ **$(A \setminus B) \cup (B \setminus A) = ?$**

A) $\{M, A, T, İ, K\}$
B) $\{M, K, E\}$
C) $\{A, T, İ\}$
D) $\{A, T, İ, Ü\}$
E) $\{T, İ, Ü, E\}$

1-E 2-D 3-A 4-B 5-B 6-C 7-A 8-A 9-E 10-E 11-C 12-D

1. $A = \{x \mid x = 3k,\ k \in N,\ x < 15\}$

$\Rightarrow$ **A = ?**

A) $\{0, 1, 2, 3, 4\}$ B) $\{1, 2, 3, 4, 5\}$

C) $\{0, 3, 6, 9, 12\}$ D) $\{3, 6, 9, 12, 15\}$

E) $\{0, 3, 6, 9, 12, 15\}$

2. $A = \{x \mid x = 2k,\ k \in Z,\ 0 < x < 25\}$

$B = \{y \mid y = 5k,\ k \in Z,\ 0 < y < 40\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 16 B) 13 C) 11 D) 5 E) 2

3. $A = \{x \mid x = 5k,\ k \in Z,\ 10 < x < 70\}$

$B = \{y \mid y = 4k,\ k \in Z,\ 10 < y < 73\}$

$\Rightarrow$ **$n(A \setminus B) = ?$**

A) 16 B) 15 C) 13 D) 11 E) 8

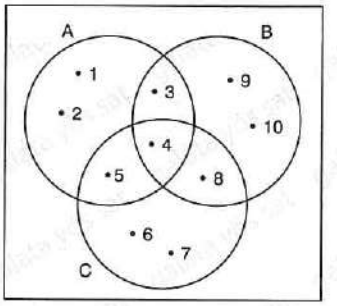
4. $A = \{x \mid x = 3k,\ k \in Z,\ -2 < x < 16\}$

$B = \{y \mid y = 4k,\ k \in Z,\ -1 < y < 21\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

A) 10 B) 12 C) 13 D) 14 E) 15

5.



$\Rightarrow$ **$B \setminus (A \cup C) = ?$**

A) $\{9, 10\}$ B) $\{9, 10, 4\}$ C) $\{3, 4, 8\}$

D) $\{3, 8, 9, 10\}$ E) $\{4\}$

6. $A = \{1, 2, 3, 4, 5\}$

$B = \{-1, 0, 1, 2, 3\}$

$C = A \cap B$

$\Rightarrow$ **$A \cup (B \cap C) = ?$**

A) A B) B C) C D) $A \setminus B$ E) $B \setminus A$

7. $n(A \cup B) = 20$

$n(A \setminus B) + n(B \cap A') = 4n(A \cap B)$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 25 B) 18 C) 12 D) 9 E) 4

8. $n(A \cup B) = 31$

$n(A \cap B) = 7$

$n(B) - n(A) = \dfrac{n(B \setminus A)}{2}$

$\Rightarrow$ **$n(A \setminus B) = ?$**

A) 7 B) 8 C) 16 D) 24 E) 31

9. $A = \{ x \mid -4 < x < 5, \quad x \in Z \}$

$B = \{ y \mid |y| \leq 3, \quad y \in R \}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 8 B) 7 C) 6 D) 5 E) 4

10. $A = \{ 1, 2, 3, \{1\}, \{2\}, \{2, 3\}, 4 \}$

$B = \{ \{3\}, 4, \{4\}, \{3, 4\} \}$

$\Rightarrow$ **$n(B \setminus A) + n(A \cup B) + n(A \cap B) = ?$**

A) 17 B) 16 C) 15 D) 14 E) 13

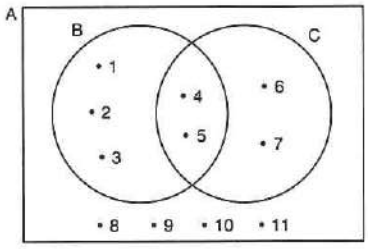
11. $A = \{ \bigcirc, \square, \bullet, \bigstar, \triangle, \heartsuit, \bullet \}$

$B = \{ \triangledown, \blacksquare, \bullet, \bigstar, \triangle, \heartsuit, \bigcirc \}$

$\Rightarrow$ **$n(B - A) + n(A \cap B) = ?$**

A) 7 B) 8 C) 9 D) 10 E) 11

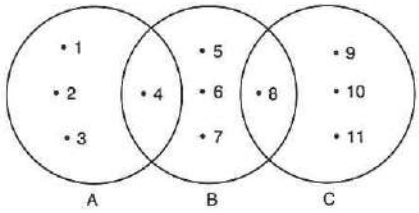
12.



$\Rightarrow$ **$n(B \setminus C) + n(A \setminus B) = ?$**

A) 5 B) 6 C) 7 D) 8 E) 9

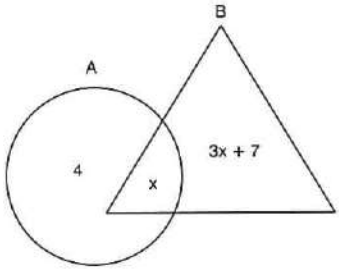
13.



$\Rightarrow$ **$n[(B \setminus C) \cap (B \setminus A)] = ?$**

A) 2 B) 3 C) 4 D) 5 E) 6

14.



$n(A \cup B)$ aşağıdakilerden hangisi <u>olamaz</u>?

Which of the following <u>cannot</u> be $n(A \cup B)$?

A) 11 B) 19 C) 21 D) 23 E) 27

1-C 2-E 3-E 4-A 5-A 6-A 7-E 8-B 9-B 10-D 11-A 12-E 13-B 14-C

1. $A = \{x \mid x \in Z,\ |x| \le 3\}$

$B = \{x \mid x \in Z,\ |x| > 4\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

2. $A = \{x \mid x \in Z,\ |x| < 5\}$

$B = \{y \mid y \in Z,\ |y - 2| < 3\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $\{0, 1, 2, 3, 4, 5\}$ B) $\{1, 2, 3, 4, 5\}$

C) $\{1, 2, 3, 4\}$ D) $\{0, 1, 2, 3, 4\}$

E) $\{0, 1, 2, 3\}$

3. $A, B \subset R$

$A = [-3, 7]$

$B = [-2, 4]$

$\Rightarrow$ **$A \setminus B = ?$**

A) $[-3, 4]$ B) $[-3, -2) \cup (4, 7]$

C) $[-2, 7]$ D) $[-3, -2] \cup [4, 7)$

E) $(-\infty, -3] \cup (7, \infty)$

4. $A, B \subset R$

$A = (-\infty, 7)$

$B = [1, \infty)$

$\Rightarrow$ **$B \cap A = ?$**

A) $(1, \infty)$ B) $(1, 7]$ C) $(1, 7)$

D) $[1, 7]$ E) $[1, 7)$

5. $A \cup B' = \{1, 2, 3, 4\}$

$C \cup B' = \{0, 1, 2, 5, 6\}$

$\Rightarrow$ **$B' \cup (A \cap C) = ?$**

A) $\{0, 1, 2, 3, 4, 5, 6\}$ B) $\{0, 1, 2, 3, 4\}$

C) $\{1, 2\}$ D) $\{1, 2, 3\}$

E) $\{1, 2, 3, 4\}$

6. $B = \{y \in Z^+ \mid x \in Z^+,\ x + y = 12\}$

$A = \{x \mid x \in Z^+,\ x \ge 4\}$

$\Rightarrow$ **$B \setminus A = ?$**

A) $\{1, 2, 3\}$ B) $\{1, 2, 3, 4, 5, 6, 7, 8\}$

C) $\{1, 2, 3, 4, \ldots 9\}$ D) $\{1, 2, 3, \ldots 11\}$

E) $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

7. $A, B \subset D$

$D = \{1, 2, 3, 4, 5, 6, 7\}$

$A' \cap B' = \{1, 2\}$

$B \cap A' = \{3, 4, 6\}$

$\Rightarrow$ **A = ?**

A) $\{4, 6\}$ B) $\{5, 7\}$ C) $\{1, 2, 4, 6\}$ D) $\{4, 5, 6\}$ E) $\{1, 3, 5\}$

8. $2n(A \setminus B) = 3n(B \setminus A) = 4n(A \cap B)$

$n(A \cup B) = 26$

$\Rightarrow$ **n(A) = ?**

A) 24 B) 22 C) 20 D) 18 E) 16

9. $(B' \cup A) \cap [A \cap (A \cup B)] = ?$

A) A B) B C) $A \cap B$ D) $A \cup B$ E) $(A \setminus B) \cup (B \setminus A)$

10. $n(A) = -x + 11$

$n(B) = -2x + 16$

$n(A \cap B) = -3x + 7$

$\Rightarrow$ **$n(A \cup B)$ = ?**

A) 22 B) 20 C) 18 D) 16 E) 14

11. $A, B, C \subset U$

$n(A) + n(B') = 7$

$n(B) + n(A') = 11$

$n(C') = 4$

$\Rightarrow$ **n(C) = ?**

A) 18 B) 12 C) 11 D) 9 E) 5

12. $B \subset U$

$n(B') = 4$

$n(B) = 3$

$\Rightarrow$ **n(U) = ?**

A) 11 B) 10 C) 9 D) 8 E) 7

13. $(A \cup B) \supset C$

$n(C - A) + n(C - B) = 3$

$n(A \cap B \cap C) = 3$

$n(A \cap B) = 7$

$n(B - A) = 5$

$\Rightarrow$ **n(B) = ?**

A) 12 B) 11 C) 10 D) 8 E) 6

1-A 2-D 3-B 4-E 5-C 6-A 7-B 8-D 9-A 10-B 11-E 12-E 13-A

1. $A = \{x \mid -7 < x < 8,\ x \in Z,\ x = 2n\}$

A kümesinin 3 elemanlı alt kümelerinin kaç tanesinin elemanları tamamen çift sayıdır?
How many of 3 element subsets of set A are completely even?

A) 70 B) 35 C) 34 D) 20 E) 15

2. $A = \{2, 4, 6, \ldots 20\}$

$B = \{3, 6, 9, \ldots 40\}$

$\Rightarrow$ **$A \cap B = ?$**

A) $\{6, 12, 18\}$ B) $\{6, 12, 15, 18\}$

C) $\{8, 12, 16, 20\}$ D) $\{6, 9, 12, 15, 18\}$

E) $\{2, 3, 4, \ldots 20\}$

3. $A, B \subset U,$

$n(A') = 10$

$n(A' \cap B') = 3$

$\Rightarrow$ **$n(B \cap A') = ?$**

A) 11 B) 10 C) 9 D) 8 E) 7

4. $n(A \cup B) = 16$

$n(A \cap B) = 4$

$n(A) = 3n(B)$

$\Rightarrow$ **$n(A) = ?$**

A) 16 B) 15 C) 13 D) 9 E) 5

5. $A \not\subset B$

$n(A) + 1 = n(B)$

$2n(A \cap B) = n(B \setminus A)$

$n(A \cup B) = 14$

$\Rightarrow$ **$n(A \setminus B) = ?$**

A) 3 B) 5 C) 6 D) 7 E) 8

6. $A \cap B \neq \varnothing$

$\Rightarrow$ **$B \cup (A \setminus B) = ?$**

A) $A \setminus B$ B) $B \setminus A$ C) A

D) B E) $A \cup B$

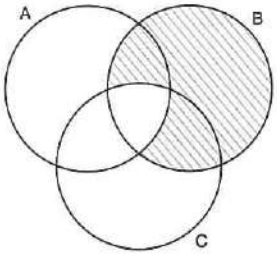
7. $A = \{n : n < 40,\ n = 2k,\ k \in N\}$

$B = \{n : n < 50,\ n = 5k,\ k \in N\}$

$\Rightarrow$ **$n(A - B) + n(B - A) = ?$**

A) 30 B) 26 C) 22 D) 16 E) 14

8.



Taralı bölge aşağıdakilerden hangisi ile ifade edilir?
Which of the following is used to represent the shaded area?

A) $B \cap (A \setminus C)$ B) $B \setminus (A \cap C)$

C) $B \cap (A \cup B)$ D) $B \setminus (A \cap C)'$

E) $(A - B) \cup (C - B)$

9. $A \subset B$

$\Rightarrow$ **$(A \setminus B) \cup (B \setminus A) = ?$**

A) $A \setminus B$ B) $A \cap B$ C) $A' \cap B'$

D) $B \cap A'$ E) $A \cup B$

10. $n(A \cap B \cap C) = 3$

$n(A \setminus B') = 4$

$n(B \setminus C') = 5$

$n(A \setminus C') = 6$

$n(A) = 8$

$n(B) = 12$

$n(C) = 12$

$\Rightarrow$ **$n(A \cup B \cup C) = ?$**

A) 16 B) 17 C) 19 D) 20 E) 21

11. $A' = B \cup C,$ $n(A') = 12$

$B' = A \cup C,$ $n(B') = 6$

$C' = A \cup B,$ $n(C') = 8$

$\Rightarrow$ **$n(A) = ?$**

A) 9 B) 7 C) 5 D) 3 E) 1

12. $A, B \subset U,\ A, B \neq \varnothing$

$(A \setminus B) = \varnothing,$ $(B \setminus A) \neq \varnothing$

$n(A \cup B) = 12,$ $n(A \cap B) = 7$

$\Rightarrow$ **$\min(n(A)) = ?$**

A) 6 B) 7 C) 8 D) 9 E) 10

1-B 2-A 3-E 4-B 5-B 6-E 7-C 8-B 9-D 10-D 11-E 12-B

ÜNİTE 13

Unit 13

Mantık / logic

1. I. "Bugün sinemaya gidelim."

"Let's go to the cinema today."

II. "En küçük asal sayı 1 dir."

"The smallest prime number is 1."

III. "Dışarıda virüs var."

"There's a virus outside."

Yukarıdaki ifadelerden hangileri önermedir?
Which of the above statements are a proposition?

A) Yalnız I B) I ve II C) II ve III D) Yalnız II E) I, II ve III

2. **Aşağıdakilerden hangisi yanlış önermedir?**
Which of the following is a false proposition?

A) $3 \cdot 4 + 5 \leq 17$

B) $x + 2 \cdot \frac{1}{x+2} = 1$

C) $5 + (-5) = 0$

D) $\forall x \in R,\ x^2 - 4 = (x-2)(x+2)$

E) $\exists x \in N,\ x - 3 < 5$

3. p ve q önermelerinin doğruluk tablosu aşağıdaki gibidir.

The truth table of the p and q propositions are as follows.

p	q
0	a
0	1
1	b
c	d

$\Rightarrow$ **a = ?, b = ?, c = ?, d = ?**

A) 0, 0, 1, 1 B) 1, 1, 0, 0 C) 1, 0, 0, 1 D) 1, 1, 1, 1 E) 0, 0, 0, 0

4. **3 farklı önermenin kaç doğruluk değeri vardır?**
How many accuracy values does 3 different propositions have?

A) 3 B) 4 C) 8 D) 16 E) 32

5. **p: "İki basamaklı en küçük tam sayı 10 dur." önermesine denk olan önerme aşağıdakilerden hangisidir?**
p: "The smallest integer with two digits is 10."
What is the proposition equivalent to the proposition?

A) Messi futbolcudur.
Messi is a football player.

B) Galata Eğitim Kurumları İstanbul'dadır.
Galata Educational Institutions is in Istanbul.

C) Korona virüs bütün dünyayı etkilemiştir.
Coronavirus affected the whole world.

D) En küçük asal sayı 1 dir.
The smallest prime number is 1.

E) $x^3 - 1 = (x-1)(x^2 + x + 1)$ dir.

6. $p \equiv 1,\quad q \equiv 0,\quad r' \equiv 1$

$\Rightarrow$ **$(p', q', r) = (?, ?, ?)$**

A) 1, 0, 1 B) 0, 1, 0 C) 0, 0, 0 D) 1, 1, 1 E) 0, 1, 1

7. $p \wedge q \equiv 1$

$\Rightarrow$ **$p' \vee q' \equiv ?$**

A) p' B) q C) $p \vee p'$ D) 1 E) p

8. $p' \equiv 0$

$q' \equiv 1$

olduğuna göre, aşağıdakilerden hangisi doğrudur?
Accordingly, Which of the following is true?

A) $p \wedge q' \equiv 0$ B) $p \vee q \equiv 0$ C) $p \wedge q \equiv 0$
D) $p \vee p' \equiv 0$ E) $p' \vee q' \equiv 0$

9. I. $0 \vee 1 \equiv 1$

II. $0 \wedge 1 \equiv 0$

III. $1 \wedge 1 \equiv 1$

Yukarıdaki ifadelerden hangisi ya da hangileri doğrudur?
Which of the above statements are true?

A) Yalnız I B) Yalnız II C) Yalnız III
D) I ve II E) I, II ve III

10. Aşağıdakilerden hangisi <u>yanlış</u> olabilir?
Which of the following might be <u>false</u>?

A) $p \wedge 1 \equiv p$ B) $p \wedge p' \equiv 0$ C) $p \vee p' \equiv 1$
D) $p \vee 1 \equiv 1$ E) $p \wedge 1 \equiv 0$

11. $[(p \wedge q) \wedge p'] \wedge p \equiv ?$

A) 0 B) 1 C) p' D) q E) $p \wedge q$

12. $[(p \vee q') \wedge r] \vee [p \vee p'] \equiv ?$

A) $r' \wedge p$ B) $p \vee r$ C) r'
D) $p' \wedge q$ E) 1

13.

p	q	p'	p' ∨ q
1	1	0	m
1	0	0	n
0	1	1	k
0	0	1	r

$\Rightarrow$ **(m, n, k, r) = (?, ?, ?, ?)**

A) 0, 1, 1, 1 B) 1, 0, 0, 0 C) 1, 0, 1, 1
D) 0, 1, 0, 1 E) 1, 0, 1, 0

14. I. $(p \vee q)' \equiv p' \wedge q'$

II. $(p \wedge q)' \equiv p' \vee q'$

III. $(p')' \equiv p$

Yukarıdaki ifadelerden hangisi ya da hangileri doğrudur?
Which of the above statements are true?

A) Yalnız I B) Yalnız II C) Yalnız III
D) I ve II E) I, II ve III

1-D 2-B 3-A 4-C 5-D 6-B 7-A 8-C 9-E 10-E 11-A 12-E 13-C 14-E

1. $p \equiv 1,\ \ q \equiv 0,\ \ r \equiv 1$

$\Rightarrow\ (p \Rightarrow q)' \wedge r \equiv ?$

A) 1 B) r' C) q

D) $p \wedge q$ E) $q \wedge r$

2. $p \Rightarrow q \equiv ?$

A) $p' \vee q'$ B) $p \vee q'$ C) $p' \vee q$

D) $p' \wedge q$ E) $p \wedge q'$

3. $(\forall x \in R,\ x > 3)' \equiv ?$

A) $\forall x \in R\ \ x < 3$ B) $\exists x \in R\ \ x \leq 3$

C) $\exists x \in R\ \ x < 3$ D) $\forall x \in R\ \ x \leq 3$

E) $\exists x \in Z\ \ x \leq 3$

4. $(p \vee q) \Rightarrow (p \wedge q') = ?$

A) 0 B) 1 C) p' D) q' E) $p \wedge q$

5. "Kış gelir ise hava soğur." **önermesinin karşıtı aşağıdakilerden hangisidir?**

"If winter comes, the weather will cool." Which of the following is the opposite of the proposition?

A) "Hava soğur ise kış gelir."
"If the weather gets cold, winter comes."

B) "Kış gelmez ise hava soğumaz."
"If winter does not come, the weather will not cool."

C) "Hava soğumaz ise kış gelmez."
"If the weather does not cool, winter does not come."

D) "Hava soğumaz ise kış gelir."
"If the weather does not cool, winter comes."

E) "Kış gelmez ise hava soğur."
"If winter does not come, the weather will cool."

6. $p \Rightarrow q$ **önermesinin tersi aşağıdakilerden hangisidir?**

Which of the following is the inverse of the $p \Rightarrow q$ proposition?

A) $q \Rightarrow p$ B) $q' \Rightarrow p'$ C) $p' \Rightarrow q'$

D) $p' \Rightarrow q$ E) $q' \Rightarrow p$

7. $q \Rightarrow r$ **önermesinin karşıt tersi aşağıdakilerden hangisidir?**

Which of the following is the opposite inverse of the $q \Rightarrow r$ proposition?

A) $r \Rightarrow q$ B) $r' \Rightarrow q'$ C) $q' \Rightarrow r'$

D) $q \wedge r$ E) $q \vee r$

8. **Aşağıdakilerden hangisi <u>yanlıştır</u>?**

Which of the following is <u>false</u>?

A) $p \Leftrightarrow p' \equiv 0$ B) $p \Leftrightarrow p \equiv 1$

C) $1 \Leftrightarrow 0 \equiv 0$ D) $0 \Leftrightarrow 0 \equiv 1$

E) $0 \Leftrightarrow 0 \equiv 0$

9. $[(p \vee p') \Rightarrow (q \wedge q')] \Leftrightarrow 0 \equiv ?$

A) 0 B) 1 C) p' D) $p' \Rightarrow q$ E) q'

10. Aşağıdakilerden hangisi doğrudur?

Which of the statements are true?

A) $1 \underline{\vee} 0 \equiv 0$ B) $0 \underline{\vee} 0 \equiv 1$

C) $1 \underline{\vee} 1 \equiv 1$ D) $0 \underline{\vee} 1 \equiv 1$

E) $p \underline{\vee} p' \equiv 0$

11. $(p \vee q) \wedge (p \vee r) \equiv ?$

A) $p \vee (q \wedge r)$ B) $p \wedge (q \vee r)$ C) $p \wedge q \wedge r$

D) 1 E) 0

12. $p \wedge (q \vee r) \equiv ?$

A) $p \wedge q \vee r$ B) $(p \wedge q) \vee (p \wedge r)$

C) $(p \vee q) \wedge (p \vee r)$ D) $p \Rightarrow q$

E) $q \Rightarrow p$

13. Aşağıdaki önermelerden hangisi totolojidir?

Which of the following propositions is a tautology?

A) $p \vee q$ B) $p \wedge q$ C) $p \Rightarrow q$

D) $r \Leftrightarrow r$ E) $p \Leftrightarrow p'$

14. Aşağıdaki önermelerden hangisi çelişkiye örnek olarak gösterilebilir?

Which of the following propositions can be cited as an example of a contradiction?

A) $p \wedge q'$ B) $p \vee p'$ C) $p \Rightarrow 1$

D) $0 \Rightarrow q$ E) $r \Leftrightarrow r'$

15. $p \Rightarrow q \equiv 0$

$p \wedge r \equiv 1$

$\Rightarrow [(q \Leftrightarrow r) \underline{\vee} p] \equiv ?$

A) 0 B) q C) p D) p' E) r'

16. $1 \underline{\vee} 0 \equiv 0$

$1 \wedge 0 \equiv 0$

$1 \vee 0 \equiv 1$

$1 \Rightarrow 0 \equiv 0$

Yukarıdaki ifadelerden kaç tanesi doğrudur?

How many of the above statements are true?

A) 0 B) 1 C) 2 D) 3 E) 4

1-A 2-C 3-B 4-D 5-A 6-C 7-B 8-E 9-B 10-D 11-A 12-B 13-D 14-E 15-C 16-D

1. **Aşağıdaki önermelerden hangisi doğrudur?**

Which of the following propositions is true?

A) $1 \wedge 0 \equiv 1$ B) $1 \vee 0 \equiv 0$

C) $1 \Rightarrow 0 \equiv 0$ D) $1 \underline{\vee} 0 \equiv 0$

E) $0 \Leftrightarrow 0 \equiv 0$

2. **n önermesinin doğruluk tablosu 64 satır ise n kaçtır?**

If the truth table of the proposition n is 64 lines, what is n?

A) 4 B) 5 C) 6 D) 7 E) 8

3. $p : 12 + 5 = 17$

$\Rightarrow$ **$p' \equiv$?**

A) $12 - 5 = 7$ B) $12 + 5 \neq 17$

C) $17 = 12 + 5$ D) $17 \neq 12 - 5$

E) $17 - 12 = 5$

4. I. $(p')' \equiv p$

II. $(0)' \equiv 1$

III. $(1)' \equiv 0$

ifadelerinden hangileri doğrudur?

Which of the statements are true?

A) Yalnız I B) I ve II C) II ve III

D) I ve III E) I, II ve III

5. $p' \wedge q \equiv 1$

olduğuna göre, aşağıdaki denkliklerden hangisi <u>yanlıştır</u>?

Accordingly, which of the following equivalents is <u>false</u>?

A) $p \vee q \equiv 1$ B) $p \wedge q \equiv 0$

C) $p \Rightarrow q \equiv 1$ D) $q \Rightarrow p \equiv 0$

E) $p \Leftrightarrow q \equiv 1$

6. **$(p \Rightarrow q)' \equiv$?**

A) $p' \wedge q$ B) $p \wedge q$ C) $p' \Rightarrow q'$

D) $p \wedge q'$ E) $p \Leftrightarrow q$

7. **$p \wedge (p \vee q) \equiv$?**

A) p B) q C) p' D) q' E) $p \Rightarrow q$

8. I. $p \vee 0 \equiv p$

II. $p \vee 1 \equiv 1$

III. $p \wedge 0 \equiv p$

IV. $p \wedge 1 \equiv p$

ifadelerinden hangileri doğrudur?

Which of the statements are true?

A) I, II, III ve IV B) I, III ve IV C) II, III ve IV

D) I, II ve IV E) I, II ve III

9. Aşağıdakilerden hangisi önermedir?
Which of the following statements is a proposition?

A) Aslan uzun boyludur.
Aslan is tall.

B) İstanbul güzel bir şehirdir.
Istanbul is a beautiful city.

C) Haydi sinemaya gidelim.
Let's go to the cinema.

D) Rusça zor bir dildir.
Russian is a difficult language.

E) Türkiye'nin başkenti İstanbul'dur.
Turkey's capital, Istanbul.

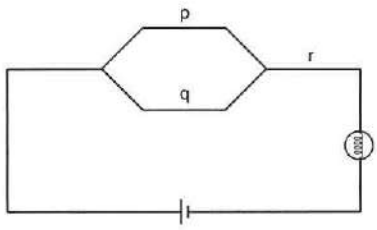
10. $(p \Rightarrow q) \wedge (q \Rightarrow p) \equiv ?$

A) $p \Leftrightarrow q$ B) $p' \vee q$ C) $p' \wedge q'$
D) $p \veebar q$ E) $p \Rightarrow q'$

11. $(p \Leftrightarrow q)' \equiv ?$

A) $p \Rightarrow q$ B) $p \veebar q$ C) $p \Rightarrow 1$
D) $p' \Leftrightarrow q'$ E) $p' \Rightarrow q'$

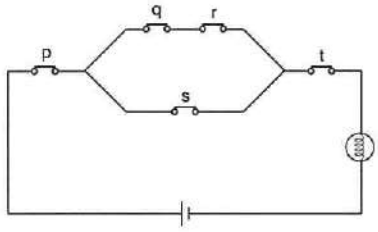
12.



Şekildeki elektrik devresine karşılık gelen bileşik önerme aşağıdakilerden hangisidir?
Which of the following is the compound proposition corresponding to the electrical circuit in the figure?

A) $p \vee q \vee r$ B) $p \wedge q \wedge r$ C) $(p \vee q) \wedge r$
D) $(p \wedge q) \vee r$ E) $(p \Rightarrow q) \wedge r$

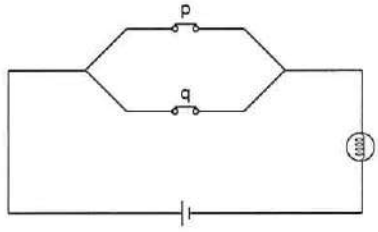
13.



Şekildeki elektrik devresine karşılık gelen bileşik önerme aşağıdakilerden hangisidir?
Which of the following is the compound proposition corresponding to the electrical circuit in the figure?

A) $p \wedge [(q \wedge r) \vee s] \wedge t$ B) $p \vee [(q \wedge r) \vee s] \wedge t$
C) $p \wedge [(q \wedge r) \vee s] \vee t$ D) $p \wedge [(q \wedge r) \wedge s] \vee t$
E) $p \wedge [(q \vee r) \wedge s] \wedge t$

14.



Şekildeki elektrik devresine karşılık gelen önermenin değili aşağıdakilerden hangisine denktir?
Which of the following is the negation proposition corresponding to the electrical circuit in the figure?

A) $p \Rightarrow q$ B) $q \Rightarrow p$ C) $p' \vee q'$
D) $p' \wedge q'$ E) $p \Leftrightarrow q$

1-C 2-C 3-B 4-E 5-E 6-D 7-A 8-D 9-E 10-A 11-B 12-C 13-A 14-D

1. $a, b, c \neq 0, \quad a, b, c \in R$

$p: a = -b$

$q: -c > a$

$r: c < 0$

$(p \wedge q) \Rightarrow r \equiv 0$

olduğuna göre, (a, b, c) = (?, ?, ?)
Accordingly, (a, b, c) = (?, ?, ?)

A) +, −, − B) −, +, + C) +, −, +
D) −, −, − E) −, +, −

2. $p: m = 0$

$q: m + n = 0$

$r: m \cdot n = 0$

önermeleri veriliyor.

Propositions are given.

Buna göre, aşağıdaki önermelerden hangisi doğrudur?
Accordingly, which of the following propositions are true?

A) $q \Rightarrow r$ B) $p \Rightarrow q$ C) $q \Rightarrow p$
D) $p \Rightarrow r$ E) $r \Rightarrow p$

3. $p: m \in M$

$q: n \in N$

$r: k \in K$

$M = N \cup K$

$\Rightarrow$ **$M \equiv$?**

A) $p = q \wedge r$ B) $p \Leftrightarrow (q \vee r)$ C) $p \Rightarrow (q \wedge r)$
D) $(p \wedge q) \Rightarrow r$ E) $q = p \vee r$

4. $[(p \vee q) \Rightarrow (q \wedge r)] \equiv s$

$\Rightarrow$ **$s \equiv$?**

A) $(q' \vee r') \Rightarrow (p' \wedge q')$
B) $(q' \wedge r') \Rightarrow (p' \vee q')$
C) $(p' \vee q') \Rightarrow (q' \wedge r')$
D) $(p' \wedge q') \Rightarrow (q' \vee r')$
E) $p \Rightarrow q$

5. $p \Leftrightarrow q \equiv 1$

$p \vee q' \equiv r$

$\Rightarrow$ **$r \equiv$?**

A) 0 B) 1 C) $p \Leftrightarrow q'$
D) $p \Rightarrow q'$ E) $q \Rightarrow p'$

6. $p: -8^8 > 3^4$

$q: 44^{44} < -80^{20}$

olduğuna göre, aşağıdaki önermelerden hangisi gerektirmedir?

Accordingly, which of the following propositions is a requirement?

A) $q' \Rightarrow p$ B) $p \vee q$ C) $p \Rightarrow q$
D) $p \Leftrightarrow q'$ E) $q \Leftrightarrow p'$

7. $p \wedge q \equiv 1$

olduğuna göre, aşağıdaki önermelerden hangisi çift gerektirmedir?
Accordingly, which of the following propositions is an even-requirement?

A) $p' \vee q'$ B) $p \Rightarrow q'$ C) $p \Leftrightarrow q'$ D) $p' \Leftrightarrow q'$ E) $p \underline{\vee} q$

8. $\left[(p \Rightarrow 1) \vee \left[p' \vee (r \wedge p')\right]\right] \equiv s$

$\Rightarrow$ **$s \equiv$?**

A) 0 B) 1 C) p' D) $p \Rightarrow q$ E) $p \Leftrightarrow q$

9. $\left[(1 \Rightarrow 0) \wedge \left((0 \Leftrightarrow 1) \vee 0\right)\right] \equiv p$

$\left[(0 \Leftrightarrow 0) \Rightarrow 0\right] \equiv q$

$\Rightarrow$ **$p \vee q' \equiv$?**

A) 1 B) 0 C) p D) q E) $p \wedge q$

10. $\left[p' \wedge q'\right] \Leftrightarrow (p \vee q) \equiv$ **?**

A) $p \Rightarrow q$ B) $q \Rightarrow p$ C) $p' \Rightarrow q$ D) 0 E) 1

11. $(\exists x \in N \;\; x > 7)' \equiv$ **?**

A) $\exists x \notin N \;\; x < 7$
B) $\forall x \in N \;\; x \leq 7$
C) $\forall x \notin N \;\; x < 7$
D) $\exists x \notin N \;\; x \leq 7$
E) $\exists x \notin N \;\; x \neq 7$

12.

p	q	$p \Leftrightarrow q$
1	1	a
1	0	b
0	1	c
0	0	d

$\Rightarrow$ **(a, b, c, d) = (?, ?, ?, ?)**

A) 1, 0, 0, 0 B) 1, 0, 1, 0 C) 1, 1, 1, 1 D) 0, 0, 0, 0 E) 1, 0, 0, 1

13. Aşağıdakilerden hangisi <u>yanlıştır</u>?
Which of the following is <u>false</u>?

A) $(p \Rightarrow 1) \equiv 1$
B) $\left[1 \vee (q' \wedge p)\right] \equiv 1$
C) $\left[p \vee (p' \vee q)\right] \equiv 1$
D) $\left[(p \Leftrightarrow p) \vee p'\right] \equiv 1$
E) $\left[(p \Leftrightarrow p') \wedge p\right] \equiv 1$

1-B 2-D 3-B 4-A 5-B 6-C 7-D 8-B 9-A 10-D 11-B 12-E 13-E

ÜNİTE 14

Unit 14

Kartezyen Çarpım ve Bağıntı / Cartesian Product and Relation

1. $x, y \in Z$

$(x + y,\ x - y) = (6, 8)$

$\Rightarrow \dfrac{x}{y} = ?$

A) -7 B) -1 C) 0 D) 1 E) 7

2. $(x \,.\, y,\ x + 3) = (-6, 0)$

$\Rightarrow y = ?$

A) -2 B) -1 C) 1 D) 2 E) 3

3. $(x^2 - y^2,\ x - y) = (12, 4)$

$\Rightarrow x \,.\, y = ?$

A) -2 B) -1 C) $-\dfrac{7}{4}$ D) $\dfrac{7}{4}$ E) 2

4. $x, y \in Z^+$

$(x^2 + 4,\ \sqrt{y}) = (13, 2)$

$\Rightarrow x + y = ?$

A) 8 B) 7 C) 5 D) 2 E) 1

5. $(4^a, 2^b) = (16, 16)$

$\Rightarrow a \,.\, b = ?$

A) 4 B) 8 C) 12 D) 16 E) 20

6. $(\sqrt{x + 4},\ \sqrt{y + 3}) = (1, 1)$

$\Rightarrow x \,.\, y = ?$

A) 20 B) 18 C) 13 D) 7 E) 6

7. $(x + 2,\ y + 3,\ z + 4) = (9, 8, 7)$

$\Rightarrow x \,.\, y - z = ?$

A) 32 B) 28 C) 25 D) 16 E) 8

8. $x, y, z \in Z$

$(x \,.\, y,\ y + z,\ x - z) = (7, 6, a)$

$\Rightarrow \max(a) = ?$

A) 14 B) 7 C) 2 D) -7 E) -14

9. $A = \{1, 2, 3\}$

$B = \{a\}$

$\Rightarrow$ **A x B = ?**

A) $\{(1, a), (2, 1), (3, a)\}$

B) $\{(a, 1), (a, 2), (a, 3)\}$

C) $\{(1, a), (2, a), (3, a)\}$

D) $\{(1, 2), (2, 3), (3, 1)\}$

E) $\{(a, a), (1, 1), (2, 2), (3, 3)\}$

10. $A \times B = \{(1, 4), (1, 5), (1, 6)\}$

$\Rightarrow$ **B x A = ?**

A) $\{(4, 1), (5, 1), (6, 1)\}$ B) $\{(1, 1)\}$

C) $\{(4, 4), (5, 5), (6, 6)\}$ D) $\{(4, 1), (6, 1)\}$

E) $\{(4, 6), (5, 1)\}$

11. $A = \{a, b, c\}$

$B = \{\square, \star, \bigcirc, \triangle,\}$

$\Rightarrow$ **n(A x B) = ?**

A) 16 B) 12 C) 9 D) 8 E) 6

12. $A \times B = \{(4, a), (4, b), (5, a), (5, b)\}$

$\Rightarrow$ **A ∪ B = ?**

A) $\{a, b\}$ B) $\{4, 5\}$ C) $\{a, 5, b\}$

D) $\{4, 5, a\}$ E) $\{a, b, 4, 5\}$

13. $A = \{1, -1, 0\}$

$B \times A = \{(a, 1), (a, 0), (a, -1)\}$

$\Rightarrow$ **B = ?**

A) $\{a\}$ B) $\{-1, 0, 1\}$ C) $\{a, 1\}$

D) $\{a, 0\}$ E) $\{a, -1\}$

14. $A \cup B = \{a, b, c, d\}$

$n[(C \times A) \cup (C \times B)] = 28$

$\Rightarrow$ **n(C) = ?**

A) 28 B) 14 C) 7 D) 2 E) 1

1-A 2-D 3-C 4-B 5-B 6-E 7-A 8-C 9-C 10-A 11-B 12-E 13-A 14-C

TEST 2

1. $A = \{x \mid 4 \le x < 7,\ x \in Z\}$

$B = \{y \mid -1 \le y \le 3,\ y \in Z\}$

$\Rightarrow$ **n(A x B) = ?**

A) 24 B) 20 C) 18 D) 16 E) 15

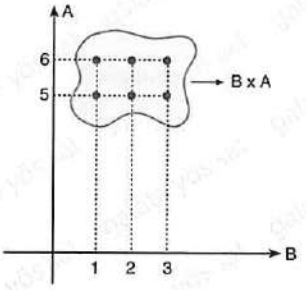
2. $A = \{x \mid 3 < x < 9,\ x \in N\}$

$B = \{y \mid 1 < y \le 5,\ y \in N\}$

$\Rightarrow$ **$n[(A \setminus B) \times A] = ?$**

A) 12 B) 14 C) 15 D) 18 E) 21

3.



$\Rightarrow$ **$A \cup B = ?$**

A) $\{1, 2, 3\}$ B) $\{5, 6\}$ C) $\{1, 2, 3, 4\}$ D) $\{4, 5, 6\}$ E) $\{1, 2, 3, 5, 6\}$

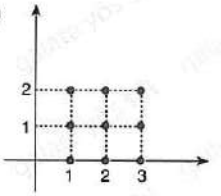
4. $A = \{1, 2, 3\}$

$B = \{0, 1, 2\}$

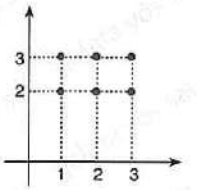
A x B nin grafiği aşağıdakilerden hangisidir?

Which one of the following is the diagram of A x B?

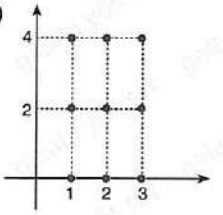
A)



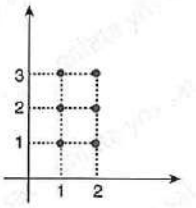
B)



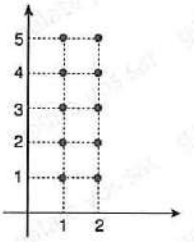
C)



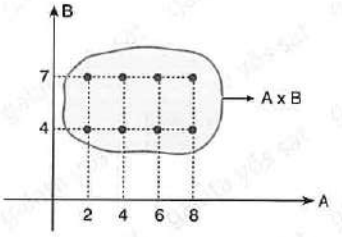
D)



E)



5.



$\Rightarrow$ **B = ?**

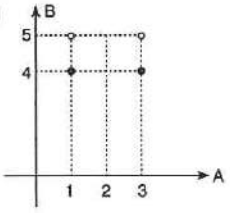
A) $\{2, 4, 6, 8\}$ B) $\{4, 5, 6\}$ C) $\{4, 5, 6, 7\}$ D) $\{4, 7\}$ E) $[2, 8]$

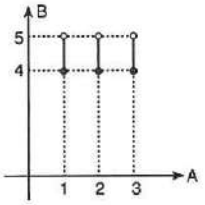
6. $A = \{1, 2, 3\}$

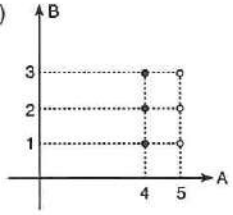
$B = [4, 5)$

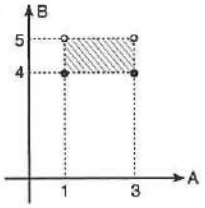
A x B nin grafiği aşağıdakilerden hangisidir?

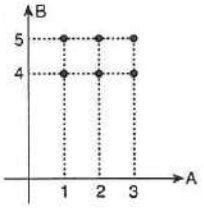
Which one of the following is the diagram of A x B?

A)


B)


C)


D)


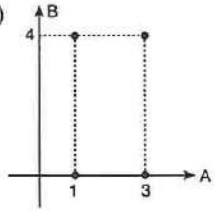
E)


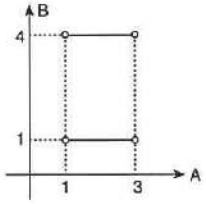
8. $A = \{x \mid 1 \le x < 3, \quad x \in R\}$

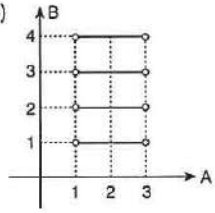
$B = \{y \mid 0 < y < 4, \quad y \in R\}$

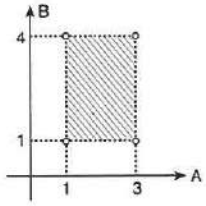
A x B nin grafiği aşağıdakilerden hangisidir?

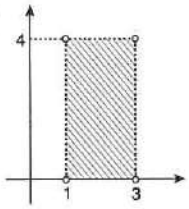
Which one of the following is the diagram of A x B?

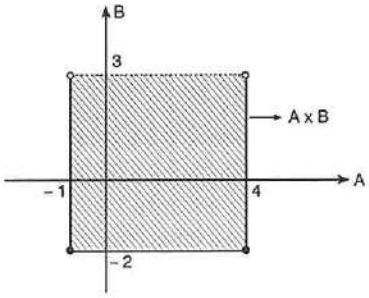
A)


B)


C)


D)


E)


7.


⇒ **A \ B = ?**

A) $(-2, -1)$ B) $[3, 4]$ C) $(3, 4]$

D) $(-2, -4] - [-1, 3)$ E) $[-1, 3)$

9. $A = \{a, b, c\}$

$B = \{-1, 0, 1\}$

A'dan B'ye bağıntı sayısı kaçtır?

What is the number of relations from A to B?

A) 9 B) 81 C) 243 D) 2^3 E) 2^9

1-E 2-C 3-E 4-A 5-D 6-B 7-B 8-E 9-E

1. $A = \{1, 2, 3\}$

$B = \{2, 3, 4\}$

$C = \{1, 2, 5\}$

$\Rightarrow$ **$n[(A \setminus B) \times C] = ?$**

A) 12 B) 9 C) 7 D) 5 E) 3

2. $A = \{b, c, d\}$

$n[A \times (A \cup B)] = 15$

$\Rightarrow$ **$\min[n(B)] = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $A = \{a, b, c\}$

kümesinde tanımlı bağıntılardan kaç tanesinde (a, a) elemanı bulunur?

From the relations on the set $A = \{a, b, c\}$

How many of them have the element (a, a)?

A) 2^9 B) 2^8 C) 2^6 D) 32 E) 8

4. $B = \{(x, y) \mid x \cdot y = 20,\ x, y \in N\}$

$\Rightarrow$ **$B = ?$**

A) $\{(1, 20), (2, 10), (4, 5), (5, 4), (10, 2), (20, 1)\}$

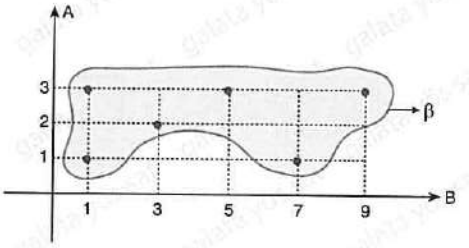
B) $\{(1, 20), (2, 10), (4, 5)\}$

C) $\{(5, 4), (10, 2), (20, 1)\}$

D) $\{(4, 4), (5, 5), (10, 10)\}$

E) $\{(1, 19), (2, 18), (3, 17) \ldots, (10, 10)\}$

5.



$\Rightarrow$ **$\beta = ?$**

A) $\{(1, 1), (2, 2), (3, 3)\}$

B) $\{(1, 1), (1, 3), (3, 2), (5, 3), (7, 1), (9, 3)\}$

C) $\{(1, 1), (2, 3), (3, 5), (7, 1), (9, 3)\}$

D) $\{(1, 1), (3, 3), (5, 7)\}$

E) $\{(1, 1), (1, 3), (2, 3), (5, 3), (7, 1), (9, 3)\}$

6. $A = \{0, 2, 4, 6\}$

$B : A \to A$

$B = \{(x, y) \mid x = 2y\}$

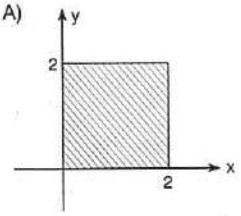
$\Rightarrow$ **n(B) = ?**

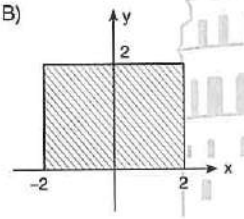
A) 16 B) 8 C) 4 D) 2 E) 1

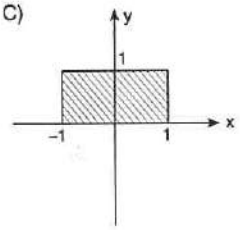
7. $B = \{(x, y) \mid |x| \le 1,\ |y| \le 2\}$

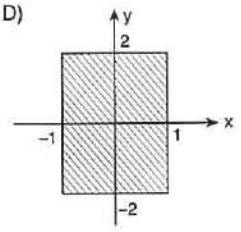
B bağıntısının grafiği aşağıdakilerden hangisidir?

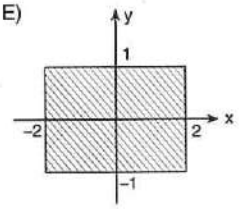
Which of the following is the graph of the B relation?

A)


B)


C)


D)


E)


8. $B = \{(a, 1), (b, 1), (a, 3), (b, 3)\}$

$\Rightarrow$ $B^{-1} = ?$

A) $B^{-1} = \{(a, a), (b, b)\}$

B) $B^{-1} = \{(1, 1), (3, 3)\}$

C) $B^{-1} = \{(1, a), (1, b), (3, a), (3, b)\}$

D) $B^{-1} = \{(a, b), (b, a), (1, 3), (3, 1)\}$

E) $B^{-1} = \{(1, 1), (3, 3), (a, a), (b, b)\}$

9. $B = \{(x, y) \mid x + 2y = 9,\ x, y \in Z^+\}$

$\Rightarrow$ $B^{-1} = ?$

A) $\{(7, 1), (5, 2), (3, 3), (1, 4)\}$

B) $\{(1, 7), (2, 5), (3, 3), (4, 1)\}$

C) $\{(0, 9), (1, 7), (5, 2), (3, 3), (1, 4)\}$

D) $\{(1, 4), (2, 6), (3, 9)\}$

E) $\{(9, 0), (7, 1), (5, 2), (3, 1)\}$

1-E 2-B 3-B 4-A 5-B 6-D 7-D 8-C 9-B

ÜNİTE 15

Unit 15

Fonksiyonlar / Functions

1. f: A → B

$f(x) = \sqrt{x+3}$

⇒ **A = ?**

A) $(-3, \infty)$ B) $[-3, \infty)$ C) $(0, \infty)$ D) $[0, \infty)$ E) $[-3, \infty]$

2. f: A → B

$f(x) = x^2 + 3x + 4$

⇒ **A = ?**

A) R B) Ø C) $\{0, -3\}$ D) $\{1, 4\}$ E) $\{1, -3\}$

3. f: A → B

$f(x) = \dfrac{x+3}{x-4}$

⇒ **A = ?**

A) Ø B) R C) $R - \{4\}$ D) $R - \{-4\}$ E) $R - \{1\}$

4. f: R → R,

Aşağıdaki fonksiyonlardan hangisi birebir ve örtendir?
Which of the following functions is a one to one and onto function?

A) $f_1 : y = x^2 - 3x + 4$ B) $f_2 : y = 4x + 5$
C) $f_3 : y = x^2$ D) $f_4 : |y| = x + 3$
E) $f_5 : y = x^3 - 4x$

5. f: A → B,

$A = \{a, b, c\}$
$B = \{d, e, f\}$

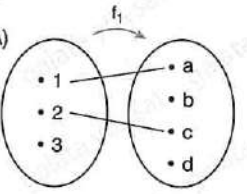
Aşağıdaki bağıntılardan hangisi fonksiyondur?
Which of the following relations is a function?

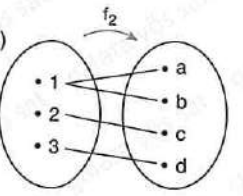
A) $f_1 = \{(a, e), (b, f), (c, d)\}$
B) $f_2 = \{(a, e), (b, e), (c, e), (a, b)\}$
C) $f_3 = \{(a, d), (a, e), (a, f)\}$
D) $f_4 = \{(b, e), (c, f)\}$
E) $f_5 = \{(a, a), (b, e), (c, f)\}$

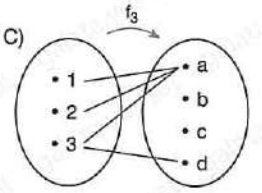
6. f: A → B,

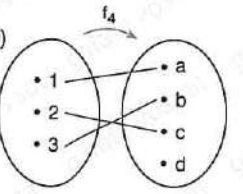
$A = \{1, 2, 3\}$
$B = \{a, b, c, d\}$

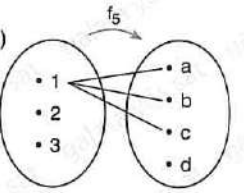
Aşağıdaki bağıntılardan hangisi fonksiyondur?
Which of the following relations is a function?

A)


B)


C)


D)


E)


7. $f: R \to R$,

Aşağıdaki bağıntılardan hangisi fonksiyondur?
Which of the following relations is a function?

A) $f_1 = \{ (x, y) \mid x + y = 4 \}$

B) $f_2 = \left\{ (x, y) \mid y = \dfrac{x+3}{x} \right\}$

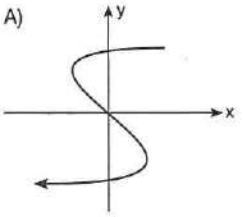
C) $f_3 = \{ (x, y) \mid x^2 + y^2 = 1 \}$

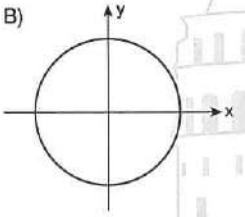
D) $f_4 = \{ (x, y) \mid x = y^2 - 4 \}$

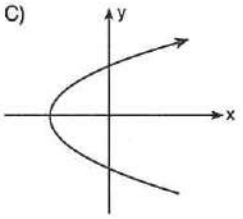
E) $f_5 = \{ (x, y) \mid |x| + |y| = 10 \}$

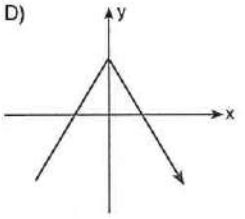
8. $f: R \to R$,

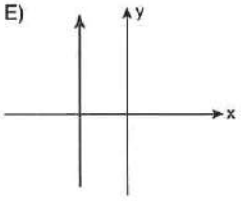
Aşağıdaki bağıntılardan hangisi fonksiyondur?
Which of the following relations is a function?

A)


B)


C)


D)


E)


9. $f: R \to R$,

$f(x) = 2x + 3$

$\Rightarrow$ **$f(5) = ?$**

A) 3 B) 5 C) 10 D) 13 E) 16

10. $f: R \to R$,

$f(x) = x^2 + 4x + 1$

$\Rightarrow$ **$f(0) + f(1) = ?$**

A) 1 B) 5 C) 6 D) 7 E) 8

11. $f: R \to R$,

$f(x) = x^2 + 3x + a$

$f(0) + f(1) = 10$

$\Rightarrow$ **$a = ?$**

A) 3 B) 6 C) 10 D) 12 E) 13

12. $f: R - \{5\} \to R - \{1\}$

$f(x) = \dfrac{x-4}{x-5}$

$\Rightarrow$ **$f(1) \cdot f(2) \cdot f(3) = ?$**

A) $-\dfrac{1}{4}$ B) $-\dfrac{1}{2}$ C) $\dfrac{1}{2}$ D) $\dfrac{1}{3}$ E) $\dfrac{1}{4}$

1-B 2-A 3-C 4-B 5-A 6-D 7-A 8-D 9-D 10-D 11-A 12-E

1. $f(x) = \begin{cases} x, & x > 0 \\ x - 3, & x \le 0 \end{cases}$

$\Rightarrow$ **f(0) + f(1) + f(– 1) = ?**

A) – 7 B) – 6 C) – 4 D) – 3 E) 1

2. $f(x - 1) = \begin{cases} \dfrac{x}{3}, & 4 < x \\ x + 3, & 0 < x \le 4 \\ x^2, & x \le 0 \end{cases}$

$\Rightarrow$ **f(6) + f(1) + f(– 1) = ?**

A) $\frac{29}{3}$ B) $\frac{22}{3}$ C) 6 D) $\frac{7}{3}$ E) 2

3. $f(x) = \begin{cases} 3x + 4, & x \ge 1 \\ 2x - 7, & x < 0 \end{cases}$

$\Rightarrow$ **f(1) + f(– 1) = ?**

A) – 1 B) – 2 C) – 3 D) – 4 E) – 5

4. $f(x - 1) = \begin{cases} x^2 - 1, & 7 \le x \\ \sqrt{x - 1}, & 2 < x < 7 \\ \dfrac{x - 1}{4}, & x \le 2 \end{cases}$

$f(4) + f(-4) + f(a) = 64$

$\Rightarrow$ **a = ?**

A) – 8 B) – 1 C) 0 D) 2 E) 7

5. f: R → R birim fonksiyon (f is an identity function)

$f(x) = (a - 4)x + (b - 3)$

$\Rightarrow$ **a . b = ?**

A) 12 B) 14 C) 15 D) 16 E) 18

6. f: R → R birim fonksiyon (f is an identity function)

$f(4m + 3) = 3m + 7$

$\Rightarrow$ **f(m + 1) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

7. f: R → R birim fonksiyon (f is an identity function)

$f(x) = (m - 4)x^2 + x$

$\Rightarrow$ **$f(m^2)$ = ?**

A) 4 B) 8 C) 16 D) 32 E) 64

8. f: R → R sabit fonksiyon (f is a constant function)

$f(x) = (m + 4)x^2 + (m - n)x + m + n$

$\Rightarrow$ **f(10) = ?**

A) 10 B) 8 C) 4 D) – 4 E) – 8

9. f: R → R sabit fonksiyon (f is a constant function)

$$f(x) = \frac{ax + 2}{4x + 6}$$

⇒ **f(a) = ?**

A) $\frac{1}{3}$ B) $\frac{5}{3}$ C) 2 D) 3 E) 4

10. f: R → R,

$$f(x) = 4x + 5$$

⇒ $f^{-1}(x) = ?$

A) $\frac{x}{4} - 5$ B) $\frac{x-4}{5}$ C) $\frac{x+4}{5}$ D) $\frac{x-5}{4}$ E) $\frac{x+5}{4}$

11. f: R → R,

$$f(x) = \frac{10x - 5}{2}$$

⇒ $f^{-1}(x) = ?$

A) $\frac{2x-5}{10}$ B) $\frac{2x+5}{10}$ C) $\frac{5x-2}{10}$ D) $\frac{5x+2}{10}$ E) $\frac{10x+5}{2}$

12. f: R − {−2} → R − {1}

$$f(x) = \frac{x + 1}{x + 2}$$

⇒ $f^{-1}(x) = ?$

A) $\frac{-2x-2}{x-1}$ B) $\frac{-2x+1}{x+1}$ C) $\frac{2x+1}{x+1}$ D) $\frac{2x-1}{x-1}$ E) $\frac{-2x+1}{x-1}$

13. f : R − {a} → R − {b}

f, birebir ve örten fonksiyon

(f is a one to one and onto function)

$$f(x) = \frac{2x + 4}{x - 3}$$

⇒ **(a . b) = ?**

A) 0 B) 2 C) 6 D) 5 E) 7

14. f : R → R,

$$f(x) = \frac{-x + 2}{x - 7}$$

⇒ $f^{-1}(x) = ?$

A) $\frac{7-x}{x-2}$ B) $\frac{7-x}{x+2}$ C) $\frac{7x+2}{x+1}$ D) $\frac{-7x+2}{x+1}$ E) $\frac{2x+7}{x-1}$

1-B 2-B 3-B 4-E 5-C 6-D 7-C 8-E 9-A 10-D 11-B 12-E 13-C 14-C

1. $f: R \to R,$

$f(x-3) = 4x - 7$

$\Rightarrow f^{-1}(x) = ?$

A) $\frac{x+7}{4}$ B) $\frac{x-7}{4}$ C) $\frac{x-5}{4}$ D) $\frac{x+5}{4}$ E) $\frac{x+4}{5}$

2. $f(2x+9) = x + 10$

$\Rightarrow f^{-1}(11) = ?$

A) 10 B) 11 C) 12 D) 13 E) 14

3. $f: R \to R,$

$f^{-1}(x-3) = a + 4x$

$f(3) = 7$

$\Rightarrow a = ?$

A) 43 B) 33 C) −33 D) −37 E) −40

4. $f(x) = \begin{cases} x+3, & x \geq 1 \\ \frac{x}{4} + 2, & x < 0 \end{cases}$

$\Rightarrow f^{-1}(13) + f^{-1}(0) = ?$

A) 10 B) 8 C) 2 D) −8 E) −10

5. $x \geq -1$

$f(x) = x^2 + 2x + 4$

$\Rightarrow f^{-1}(x) = ?$

A) $\sqrt{x+1} - 3$ B) $\sqrt{x-1} + 3$ C) $\sqrt{x-3} - 1$ D) $-\sqrt{x-3} - 1$ E) $\sqrt{x+3} - 1$

6. $f: [-3, \infty) \to [-8, \infty)$

$f(x) = 2x^2 + 12x + 10$

$\Rightarrow f^{-1}(x) = ?$

A) $\sqrt{\frac{x+8}{2}} - 3$ B) $\sqrt{\frac{x+8}{2}} + 3$ C) $\sqrt{\frac{x-8}{2}} - 3$ D) $\sqrt{\frac{x-8}{2}} + 3$ E) $\sqrt{\frac{x-8}{3}} + 2$

7. $f: R \to R,$

$f(x) = \sqrt[3]{x-2}$

$\Rightarrow f^{-1}(4) = ?$

A) 62 B) 64 C) 66 D) 68 E) 84

8. $f(x-2) = 2x+3$

$\Rightarrow$ **f(x) = ?**

A) $2x-1$ B) $2x+1$ C) $2x+3$ D) $2x+5$ E) $2x+7$

9. $f(4x-3) = 3x+7$

$\Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\frac{4x+21}{3}$ B) $\frac{4x-21}{3}$ C) $\frac{4x-37}{3}$ D) $\frac{4x+37}{3}$ E) $\frac{3x+37}{4}$

10. $f\left(\frac{x+1}{x-2}\right) = \frac{x-4}{x+2}$

$\Rightarrow$ **f(x) = ?**

A) $\frac{-2x+5}{4x+1}$ B) $\frac{-2x+5}{4x-1}$ C) $\frac{2x-5}{4x-1}$ D) $\frac{2x-5}{4x+1}$ E) $\frac{x-5}{4x+1}$

11. $\frac{2}{2x+3} = f\left(\frac{1}{x+1}\right)$

$\Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\frac{2x}{2-x}$ B) $\frac{2x}{2+x}$ C) $\frac{x}{2-x}$ D) $\frac{x}{2+x}$ E) $\frac{2+x}{2x}$

12. $f: R-\{a\} \to R-\{b\}$

f, birebir ve örten fonksiyon

(f is a one to one and onto function)

$f(x) = \frac{x+3}{2x-4}$

$\Rightarrow$ **a . b = ?**

A) $\frac{1}{2}$ B) 1 C) 2 D) 3 E) 4

13. $f\left(\frac{x+3}{x-7}\right) = \frac{2x-14}{x+3} + 5$

$\Rightarrow$ **$f^{-1}(4)$ = ?**

A) $-\frac{1}{2}$ B) -1 C) -2 D) -3 E) -5

14. $f^{-1}(x+11) = \frac{ax+4}{x-9}$

$f(a) = 4$

$\Rightarrow$ **a = ?**

A) $-\frac{8}{9}$ B) $-\frac{7}{9}$ C) $-\frac{6}{9}$ D) $-\frac{5}{9}$ E) $-\frac{4}{9}$

15. $(f^{-1})^{-1}(3) = 4$

$f(2x+5) = x+m$

$\Rightarrow$ **f(m) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

1-C 2-B 3-D 4-C 5-C 6-A 7-C 8-E 9-C 10-B 11-A 12-B 13-C 14-E 15-A

1. $f: R \to R,$

$f(x) = 4x + 5$

$\Rightarrow$ **$f(x + 2) = ?$**

A) $4x + 7$ B) $4x + 11$ C) $4x + 13$ D) $4x + 14$ E) $4x + 15$

2. $f: R \to R,$

$f(x + 2) = 2x - 7$

$\Rightarrow$ **$f(x) = ?$**

A) $2x - 9$ B) $2x - 11$ C) $2x - 13$ D) $2x - 15$ E) $2x - 17$

3. $f: R \to R,$

$f(x - 7) = \dfrac{x + 1}{x - 3}$

$\Rightarrow$ **$f(x + 4) = ?$**

A) $\dfrac{x + 12}{x + 8}$ B) $\dfrac{x + 12}{x - 8}$ C) $\dfrac{x + 5}{x + 1}$ D) $\dfrac{2x + 5}{2x + 1}$ E) $\dfrac{2x + 12}{2x + 8}$

4. $f: R \to R,$

$f\left(\dfrac{x - 4}{3}\right) = 10x + 1$

$\Rightarrow$ **$f(x + 2) = ?$**

A) $30x + 119$ B) $30x + 101$ C) $30x + 100$ D) $30x + 99$ E) $30x + 91$

5. $f: R \to R,$

$f(x) = x^2 + 3x + 2$

$\Rightarrow$ **$f(x - 1) = ?$**

A) $x^2 - x + 1$ B) $x^2 + x - 1$ C) $x^2 + x + 1$ D) $x^2 + x$ E) $x^2 - x$

6. $f: R \to R,$

$f(x + 1) = x^3 - 3x^2 + 3x - 1$

$\Rightarrow$ **$f(x + 2) = ?$**

A) $x^3 + 8$ B) $x^3 + 2$ C) $x^3 + 1$ D) $x^2 + x$ E) x^3

7. $f: R \to R,$

$f(x) = 2^{1 + 2 + 3 + \ldots + x}$

$\Rightarrow$ **$f\left(\sqrt{x + \dfrac{1}{4}} - \dfrac{1}{2}\right) = ?$**

A) 2^x B) $\sqrt{2^x}$ C) x D) 2 E) 1

8. $f: R \to R,$

$f\left(x^{\frac{3}{5}}\right) = x^9 + x^3 + 1$

$\Rightarrow$ **$f(x) = ?$**

A) $x^{15} - x^5 + 1$ B) $x^{15} - x^5 - 1$ C) $x^{15} + x^5 + 1$ D) $-x^5 - 1$ E) $x^{\frac{5}{3}} + x^{\frac{3}{5}} + 1$

9. $f: Z \to Z,$

$f(x + 2) + 1 = f(x)$

$f(0) = 5$

$\Rightarrow$ **$f(6) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $f(x + 1) = \dfrac{f(x)}{x}$

$f(3) = 2$

$\Rightarrow$ **$f(1) = ?$**

A) 6! B) 5! C) 4! D) 3! E) 4

11. $f(x + 1) = xf(x)$

$f(1) = 2$

$\Rightarrow$ **$f(13) = ?$**

A) 2 .12! B) 12! C) 11! D) 10! E) 9!

12. $xf(x + 5) - f(x + 1) = 7$

$f(3) = 5$

$\Rightarrow$ **$6 . f(11) = ?$**

A) 26 B) 19 C) 17 D) 15 E) 13

13. $f(x) = 2x + 1$

$f(x + 1)$ in $f(x)$ türünden değeri nedir?

What is the value of $f(x + 1)$ in terms of $f(x)$?

A) $f(x) + 3$ B) $f(x) + 2$ C) $f(x) + 1$ D) $f(x)$ E) $f(x) - 1$

14. $f(x + 1) = \dfrac{x - 2}{x - 3}$

$f(x + 1)$ in $f(x)$ cinsinden değeri nedir?

Which of the following gives $f(x + 1)$ in terms of $f(x)$?

A) $\dfrac{-1 + 2f(x)}{f(x)}$ B) $\dfrac{-1 - 2f(x)}{f(x)}$ C) $\dfrac{f(x) - 2}{f(x)}$ D) $\dfrac{f(x) + 2}{f(x)}$ E) $\dfrac{f(x) - 2}{f(x) - 1}$

15. $f(x - 4) = 5^{2x}$

$f(x) . f(x + 1)$ in $f(x - 4)$ cinsinden değeri nedir?

Which of the following gives $f(x) . f(x + 1)$ in terms of $f(x - 4)$?

A) $5^{18} . [f(x - 4)]^2$ B) $[5f(x - 4)]^{18}$

C) $5^{14} . f(x - 4)$ D) $18f(x - 4)$

E) $\dfrac{f(x - 4)}{5}$

1-C 2-B 3-A 4-B 5-D 6-E 7-B 8-C 9-B 10-E 11-A 12-E 13-B 14-A 15-A

1. $f(x) = 2x + 4$

$g(x) = x - 7$

$\Rightarrow$ **fog(x) = ?**

A) $2x - 11$ B) $2x - 10$ C) $2x - 3$ D) $2x + 3$ E) $2x + 10$

2. $f(x) = 3x + 1$

$fog(x) = 6x - 8$

$\Rightarrow$ **g(x) = ?**

A) $2x - 3$ B) $2x + 3$ C) $2x + 7$ D) $18x - 2$ E) $18x + 2$

3. $f(x) = 5x - 1$

$gof(x) = x - \frac{6}{5}$

$\Rightarrow$ **g(x) = ?**

A) $\frac{x+1}{5}$ B) $\frac{x}{5} + 1$ C) $\frac{x}{5} - 1$ D) $\frac{x-1}{5}$ E) $\frac{x+5}{2}$

4. $f(x) = 5x + 5$

$\Rightarrow$ **fof(x) = ?**

A) $25x + 25$ B) $25x + 30$ C) $25x + 35$ D) $x + 1$ E) $x - 1$

5. $f(x) = 7x + 10$

$g(x + 3) = 4x - 10$

$\Rightarrow$ **fog(7) = ?**

A) 42 B) 47 C) 50 D) 52 E) 54

6. $f(x) = x - 4$

$g(x) = 5x + 3$

$\Rightarrow$ **$f^{-1}og(3)$ = ?**

A) 12 B) 14 C) 15 D) 18 E) 22

7. $a > 0$

$f(x) = ax + b$

$fof(x) = 9x + 8$

$\Rightarrow$ **f(5) = ?**

A) 13 B) 15 C) 17 D) 18 E) 20

8. $f(x - 7) = g^{-1}(x - 3)$

$\Rightarrow$ **gof(x) = ?**

A) $x - 3$ B) $x + 3$ C) $x + 4$ D) $x + 10$ E) $x + 13$

9. $f(x) = 2x + 4$

$g(x) = \frac{x}{2}$

$h(x) = x^2 - 4$

$\Rightarrow$ **fogoh(2) = ?**

A) 0 B) 2 C) 4 D) 10 E) 12

10. $f(x) = \frac{x}{2} + 5$

$(gof^{-1})^{-1}(x) = x + 1$

$\Rightarrow$ **g(7) = ?**

A) 9 B) 8 C) $\frac{15}{2}$ D) 7 E) $\frac{13}{2}$

11. $f(x) = \frac{3x + 4}{x - 3}$

$\Rightarrow$ **fofofof(x) = ?**

A) x B) $\frac{3x + 4}{x - 3}$ C) $\frac{3x + 4}{x + 3}$ D) $\frac{3x - 3}{x - 4}$ E) $\frac{3x - 3}{x + 4}$

12. $f(x) = \begin{cases} x - 2, & x > 1 \\ 2x - 1, & x \leq 1 \end{cases}$

$g(x) = 3x + 2$

$\Rightarrow$ **fog(3) = ?**

A) 5 B) 9 C) 15 D) 17 E) 21

13. $fog(x + 3) = h^{-1}(4x - 1)$

$\Rightarrow$ **hofog(5) = ?**

A) 8 B) 7 C) 6 D) 5 E) −5

14. $f^{-1}(x + 2) = g(2x + 3)$

$g(5) = 7$

$\Rightarrow$ **f(7) = ?**

A) 8 B) 7 C) 5 D) 3 E) 2

15. $f(x) = \frac{1}{x}$

$\Rightarrow$ **fofof(x) = ?**

A) $-x$ B) x C) $\frac{1}{x}$ D) $\frac{1}{x^2}$ E) $\frac{1}{x^3}$

16. $fog(x + 4) = g(x - 3)$

$f(x) = x - 4$

$\Rightarrow$ **g(7) − g(0) = ?**

A) 1 B) 3 C) 4 D) 7 E) 11

1-B 2-A 3-C 4-B 5-D 6-E 7-C 8-C 9-C 10-C 11-A 12-B 13-B 14-D 15-C 16-C

1. $f(x) = 2x + 8$

$g(x) = x - 1$

$\Rightarrow$ **$f(x) + g(x) - f(x) \cdot g(x) = ?$**

A) $2x^2 - 5x + 3$ B) $2x^2 - 3x - 15$

C) $2x^2 - 3x + 15$ D) $-2x^2 - 3x + 15$

E) $-2x^2 - 3x - 15$

2. $f(x) = 2x - 3$

$g(x) = 4x - 6$

$\Rightarrow$ **$\dfrac{f(x)}{g(x)} + f(2) = ?$**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

3. $f : \{1, 2, 3\} \to R$, $f(x) = x + 5$

$g : \{2, 3, 4\} \to R$, $g(x) = 2x - 11$

$\Rightarrow$ **$(f + g)(x) = ?$**

A) $\{(1, -3), (2, 0)\}$ B) $\{(1, -3), (3, 3)\}$

C) $\{(2, 0), (3, 3)\}$ D) $\{(1, -3)\}$

E) $\{(1, -3), (2, 0), (3, 3)\}$

4. f(x) : doğrusal fonksiyon

f(x) : linear is a function

$f(1) = 4$

$f(3) = 8$

$\Rightarrow$ **$f(7) = ?$**

A) 8 B) 12 C) 15 D) 16 E) 20

5. $f(x) = ax + b$

$f(4) = -3$

$f(a) = -7$

$\Rightarrow$ **$f(1) = ?$**

A) -11 B) -9 C) -7 D) -5 E) -3

6. $f(x) = ax + b$

$f^{-1}(2) = 3$

$f^{-1}(10) = 5$

$\Rightarrow$ **$f(x) = ?$**

A) $4x + 10$ B) $4x - 10$ C) $\frac{1}{4}x + \frac{5}{2}$

D) $\frac{x}{4} - \frac{5}{2}$ E) $2x + \frac{5}{2}$

7. f : permütasyon fonksiyon (permutation function)

$$f\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 1 & 2 & 3 \end{pmatrix}$$

$\Rightarrow$ **$f(1) + f^{-1}(2) + f(3) = ?$**

A) 6 B) 7 C) 8 D) 9 E) 10

8. $f\begin{pmatrix} a & b & c & d \\ b & c & d & a \end{pmatrix}$

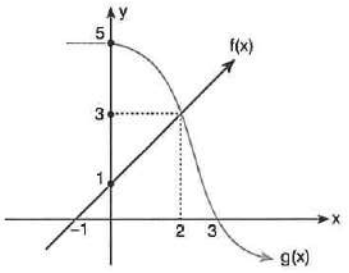
$g\begin{pmatrix} a & b & c & d \\ b & a & c & d \end{pmatrix}$

$\Rightarrow$ **$fog = ?$**

A) $\begin{pmatrix} a & b & c & d \\ c & b & d & a \end{pmatrix}$ B) $\begin{pmatrix} a & b & c & d \\ c & b & a & d \end{pmatrix}$ C) $\begin{pmatrix} a & b & c & d \\ a & b & c & d \end{pmatrix}$

D) $\begin{pmatrix} a & b & c & d \\ d & c & b & a \end{pmatrix}$ E) $\begin{pmatrix} a & b & c & d \\ d & c & a & b \end{pmatrix}$

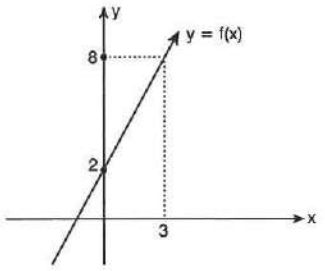
9.



$\Rightarrow$ **$fog(3) + f^{-1}(-2) + g(0) = ?$**

A) –6 B) –5 C) 3 D) 5 E) 6

10.



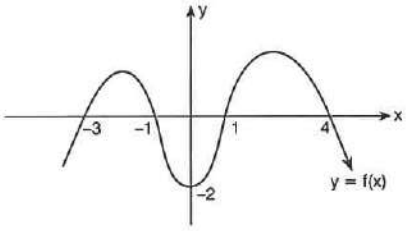
f : doğrusal fonksiyon

f(x): linear function

$\Rightarrow$ **$f(11) = ?$**

A) $\frac{25}{3}$ B) $\frac{26}{3}$ C) 9 D) 24 E) 26

11.

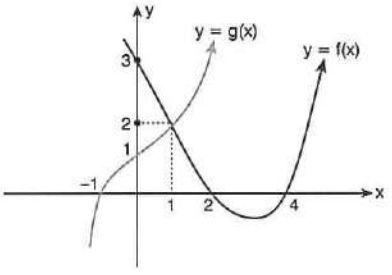


$f(a) = 0$

$\Rightarrow$ **$\Sigma a = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

12.



$\Rightarrow$ **$fog^{-1}(1) + gof(4) = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

1-D 2-C 3-C 4-D 5-B 6-B 7-D 8-A 9-C 10-D 11-B 12-A

1. $f(x) = 4^x + 2$

$\Rightarrow$ **$f(x + 2) = ?$**

A) $2f(x) + 2$ B) $8f(x) - 4$ C) $8f(x) + 4$ D) $16f(x) + 2$ E) $16f(x) - 30$

2. $fog(x) = g(x) + 4$

$\Rightarrow$ **$f(2) + f(3) + f(4) = ?$**

A) 13 B) 14 C) 15 D) 20 E) 21

3. $f(x + 2) = \dfrac{1}{x + 3}$

$g(x - 3) = 4x - 5$

$\Rightarrow$ $\dfrac{1}{(g^{-1}of^{-1})^{-1}(x)} = ?$

A) $4x + 7$ B) $4x + 8$ C) $\dfrac{1}{4x + 8}$ D) $\dfrac{1}{4x + 7}$ E) $\dfrac{1}{4x - 7}$

4. $f(x^3 + x^2 + x) = 3x^3 + 3x^2 + 3x + 5$

$\Rightarrow$ **$f^{-1}(38) = ?$**

A) 12 B) 11 C) 10 D) -10 E) -11

5. $f(\sqrt{x + 2}) = 2x + 5$

$\Rightarrow$ **$f^{-1}(19) = ?$**

A) -3 B) -2 C) 0 D) 2 E) 3

6. $f(x) = \dfrac{2x + 1}{4}$

$g(x) = \dfrac{3}{x + 1}$

$\Rightarrow$ **$gof(x) = ?$**

A) $\dfrac{12}{2x + 5}$ B) $\dfrac{12x}{2x + 5}$ C) $\dfrac{12x}{2x - 5}$ D) $\dfrac{5}{12x + 5}$ E) $\dfrac{5x}{12x - 5}$

7. $f(x^2 + 4x + 2) = x^2 + 3x + a$

$f(-1) = \sqrt{x + 2}$

$\Rightarrow$ **$a = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $f(x_1) = f(x_2) = 0$

$f(x) = ax^2 + 8x + a - 6$

$\Rightarrow$ **$max(a) \,.\, min(a) = ?$**

A) -16 B) -8 C) 4 D) 16 E) 20

9. $\dfrac{4f(x) + 3x}{f(x + 2)} = 4$

$f(0) = 1$

$\Rightarrow$ **$f(8) = ?$**

A) 10 B) 9 C) 8 D) 7 E) 6

10. $\dfrac{2f(x) - 3}{f(x) + 4} = x$

$\Rightarrow$ **$f^{-1}(1) = ?$**

A) 7 B) 5 C) 3 D) $-\dfrac{1}{3}$ E) $-\dfrac{1}{5}$

11. $f(3x + 3) - f(3x + 6) + 3x = 0$

$f(15) = 23$

$\Rightarrow$ **$f(3) = ?$**

A) 1 B) 5 C) 15 D) 38 E) 40

12. $f(x) = 2x - 4$

$g(x) = 3^x$

$gof(a) = 243$

$\Rightarrow$ **$a = ?$**

A) 9 B) $\dfrac{9}{2}$ C) $\dfrac{9}{4}$ D) $\dfrac{9}{5}$ E) $\dfrac{9}{7}$

13. $f(x) = \dfrac{x - 7}{4}$

$(f^{-1}og^{-1})(x) = 2^x - 3$

$g^{-1}(m) = -2$

$\Rightarrow$ **$m = ?$**

A) -2 B) -1 C) 1 D) 2 E) 3

14. $f(x) = 4x - 3$

$g(x) = \dfrac{x}{4}$

$\Rightarrow$ **$fof^{-1}(3) + gog^{-1}(4) = ?$**

A) 10 B) 9 C) 7 D) $\dfrac{27}{4}$ E) $\dfrac{23}{4}$

15. $f(x) = x + 7$

$g(x) = x + 7$

$\Rightarrow$ **$f^{-1}ogog^{-1}of(x) = ?$**

A) $x + 49$ B) $x + 14$ C) $7x$ D) x E) $-x$

1-E 2-E 3-B 4-B 5-E 6-A 7-C 8-A 9-A 10-E 11-B 12-B 13-C 14-C 15-D

1. $f(x) = 3^{x+4}$

$\Rightarrow$ **$f(m + n) = ?$**

A) $\frac{f(m) \cdot f(n)}{81}$ B) $f(m - n) \cdot f(m)$

C) $\frac{f(m + 1) \cdot f(n - 1)}{243}$ D) $\frac{f(m - n + 4)}{4}$

E) $f(m) + f(n)$

2. $f(x) : R \to R,$

$f(x) = x^2 - 4x + 5$

$\Rightarrow$ **$f^{-1}(x) = ?$**

A) $2 + \sqrt{x - 1}$ B) $2 - \sqrt{x - 1}$

C) $-2 - \sqrt{x - 1}$ D) $-2 + \sqrt{x - 1}$

E) f fonksiyonunun tersi yoktur.
(f^{-1} does not exist)

3. $f(x) = 5^{2x}$

$\Rightarrow$ **$f(m + n + 2) = ?$**

A) $f(m) + f(n)$ B) $625\, f(m) \cdot f(n)$

C) $125\, f(m) \cdot f(n)$ D) $f(m + 2) + f(n)$

E) $25\, f(m) \cdot f(n)$

4. $f(x) : R \to R,$

$f(x) = \frac{2x + 4}{(m - 3)x + 4}$

$\Rightarrow$ **$f^{-1}(x)$ fonksiyon ise $m = ?$**

If $f^{-1}(x)$ is a function, what is m?

A) 1 B) 2 C) 3 D) 4 E) 6

5. $f(x) = \frac{x + 1}{2x - 1}$

$g(x) = \frac{x}{5}$

$\Rightarrow$ **$fofofog^{-1}(x) = ?$**

A) $\frac{5x + 1}{10x - 1}$ B) $\frac{x + 5}{2x - 5}$ C) $\frac{x - 5}{2x + 5}$

D) $5x$ E) $\frac{x}{5}$

6. $m > 0,$

$f(x) = mx$

$g(x) = \frac{x}{3}$

$fogofog(x) = 4x$

$\Rightarrow$ **$f^{-1}(x) = ?$**

A) $\frac{x}{6}$ B) $\frac{x}{5}$ C) $\frac{x}{2}$ D) $5x$ E) $6x$

7. $f(x) = x^2 + x + 1$

$\Rightarrow$ **$f(x + 1) - f(x - 1) = ?$**

A) $3x + 2$ B) $x + 4$ C) $4x - 2$ D) $4x + 2$ E) $x + 2$

8. $f(x) = 2x - 5$

$(fog)(x) = (gof)(x)$

$\Rightarrow$ **$g(5) = ?$**

A) 5 B) 10 C) 15 D) 20 E) 25

9. $f: A \to B,$

$A = \{0, 1, 2\}$

$f(x) = x^2 + 2x + 3$

$\Rightarrow$ **$\sum B = ?$**

A) 3 B) 6 C) 11 D) 17 E) 20

10. $f(4x + 3) = 16x^2 + 28x + 12$

$\Rightarrow$ **$f(x^2 + 1) = ?$**

A) $4x^2 + 3x$ B) $x^4 + 4x^2 + 3x$ C) $x^4 - 3x^2$ D) $x^4 + 3x^2 + 2$ E) $x^4 - 3x^2 - 2$

11. $f: A \to B,$

$y = f(x)$

$yx^2 + 4 = -y - yx$

$\Rightarrow$ **$A = ?$**

A) $\varnothing$ B) $\{0, 4\}$ C) $\{1, 4\}$ D) $\{0, 1, 4\}$ E) R

12. $f: A \to B,\ A, B \subset R$

$y = f(x)$

$\frac{2}{x} + \frac{3}{y} = 4$

$\Rightarrow$ **$y = f(x) = ?$**

A) $\frac{3x}{4x + 2}$ B) $\frac{3x}{4x - 2}$ C) $\frac{4x - 2}{3x}$ D) $\frac{4x + 2}{3x}$ E) $\frac{4x + 3}{2}$

13. $f(x) = \frac{x + 4}{2x - 3}$

$g(x) = \frac{4x + 1}{x + 5}$

$(g^{-1}of)(x) = 2$

$\Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

1-A 2-E 3-B 4-C 5-D 6-A 7-D 8-A 9-E 10-D 11-E 12-B 13-E

1. $f: A \to B,\ A, B \subset R$

$$f(x) = \frac{3x}{x-m}$$

$$fofof(x) = \frac{3x}{x-m}$$

$\Rightarrow$ **m = ?**

A) 0 B) 1 C) 2 D) 3 E) 5

2. $f, g: R \to R,$

$$g(x) = \frac{x}{4} + 2$$

$$gof(x) = 4g(x) + 1$$

$\Rightarrow$ $\mathbf{f^{-1}(x) = ?}$

A) $4x + 28$ B) $4x - 28$ C) $\frac{x-28}{4}$ D) $\frac{x+28}{4}$ E) $4(x-2)$

3. $f: R - \{m\} \to R - \{n\},\ \ y = f(x)$

f : birebir ve örten fonksiyon

f is a one to one and onto function

$$4xy + y = x - 3$$

$\Rightarrow$ **m + n = ?**

A) $-\frac{1}{16}$ B) $-\frac{1}{4}$ C) 0 D) $\frac{1}{4}$ E) $\frac{1}{2}$

4. $f(x) = x^2 + 6x + 7$

$fog(x) = x + 4$

$\Rightarrow$ $\mathbf{max[g(3)] = ?}$

A) 3 B) 0 C) −3 D) −6 E) −9

5. $f(x) = 2x + 1$

$g(x) = x^2 + 2x + 3$

$\Rightarrow$ $\mathbf{(fog^{-1})^{-1}(x) = ?}$

A) $\frac{x^2 + 2x + 9}{4}$ B) $\frac{x^2 + 2x + 8}{4}$ C) $\frac{x^2 - 2x + 9}{4}$ D) $\frac{x^2 + 8x + 2}{4}$ E) $\frac{x^2 + 8x + 9}{4}$

6. $f: A \to B,$

$A = \{a, b, c\}$

$B = \{x, y, z, m, n, p\}$

f(a) = x olacak şekilde kaç tane birebir f fonksiyonu yazılabilir?

How many one to one f function can be written for f(a) = x?

A) 20 B) 24 C) 28 D) 32 E) 60

7. f, g, Z → Z,

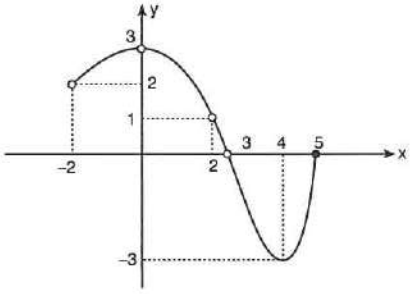
$$f(x) = \begin{cases} x, & x = 0 \pmod 2 \\ 2x + 3, & x = 1 \pmod 2 \end{cases}$$

$$g(x) = \begin{cases} 3x + 1, & x = 0 \pmod 2 \\ x - 2, & x = 1 \pmod 2 \end{cases}$$

⇒ **fog(4) = ?**

A) 13 B) 29 C) 33 D) 39 E) 44

8. f : A → B,



⇒ **A = ?**

A) $(-2, 5]$ B) $[-2, 5]$ C) $[-3, 3]$

D) $[-2, 5] - \{0, 1\}$ E) $(-2, 5] - \{0, 2, 3\}$

9. f, g : A → A,

$A = \{0, 1, 2, 3, 4\}$

$$f\begin{pmatrix} 0 & 1 & 2 & 3 & 4 \\ 2 & 3 & 1 & 0 & 4 \end{pmatrix}$$

$$g\begin{pmatrix} 0 & 1 & 2 & 3 & 4 \\ 1 & 3 & 0 & 2 & 4 \end{pmatrix}$$

⇒ $\mathbf{f^{-1}(g(1)) = ?}$

A) 0 B) 1 C) 2 D) 3 E) 4

10. $f_1, f_2, f_3, f_4, f_5 : R \to R$,

$f_1(x) = 2x + 3$

$f_2(x) = x^2$

$f_3(x) = -x^2 + 4$

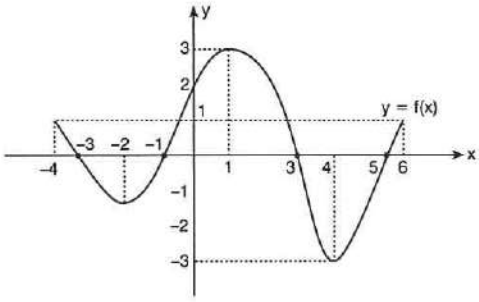
$f_4(x) = 2x^3$

$f_5(x) = -5x$

fonksiyonlarından kaç tanesi birebirdir?
How many of the above functions is a one to one function?

A) 1 B) 2 C) 3 D) 4 E) 5

11.



$g(x) = f(x + 1) - f(x - 1)$

⇒ **g(5) + g(4) = ?**

A) 4 B) 2 C) 1 D) 0 E) –2

12. Q, rasyonel sayılar kümesi (Q, rational numbers set)

$$f(x) = \begin{cases} x^2 + 1, & x \notin Q \\ \frac{2}{3}x + 4, & x \in Q \end{cases}$$

⇒ $\mathbf{fof\left(\frac{1}{\sqrt{2}}\right) = ?}$

A) 4 B) 5 C) $\frac{\sqrt{2}}{3} + 4$ D) $\frac{3}{\sqrt{2}} + 4$ E) 9

1-D 2-C 3-C 4-B 5-A 6-A 7-B 8-E 9-B 10-C 11-A 12-B

1. $f(x) = |x + 4|$

$g(x) = |3x + 1|$

$fog(x) = 5$

$\Rightarrow$ **$\Sigma x = ?$**

A) $\frac{2}{3}$ B) $\frac{1}{3}$ C) 0 D) $-\frac{2}{3}$ E) -1

2. $f : R \to R$, $\forall x \in R$ için $f(x) < f(x + 3)$

Buna göre, (Accordingly)

I. $f(0) < f(6)$

II. $|f(-3)| > |f(0)|$

III. $f(0) + f(6) < 2f(9)$

ifadelerinden hangileri daima doğrudur?
Which of the statements is always true?

A) Yalnız I B) I ve II C) I, II ve III
D) I ve III E) II ve III

3. $f(x) = 4x^4 + 2x^3 - 5x^2 + x - 2$

$\Rightarrow$ **$x.f\left(\frac{x^4}{x^3}\right) = ?$**

A) $4x^5 + 2x^4 - 5x^3 + x^2 - 2x$

B) $4x^4 + 2x^3 - 5x^3 + x - 2$

C) $4x^3 + 2x^2 - 5x + 1$

D) $2x^3 + x^2 - \frac{5}{2}x + \frac{1}{2}$

E) $\frac{4}{3}x^4 + \frac{2}{3}x^3 - \frac{5}{3}x^2 + \frac{x}{3} - \frac{2}{3}$

4. I. $f(x) = 5x$

II. $f(x) = x^5$

III. $f(x) = 5^x$

fonksiyonlarından hangileri a, b $\in$ R için
$f(a + b) = f(a) . f(b)$ eşitliğini sağlar?
Which of the functions make provides $f(a + b) = f(a) . f(b)$ equality for a, b $\in$ R?

A) Yalnız I B) Yalnız II C) Yalnız III
D) I, II ve III E) II ve III

5. $gof(x) = f(x) . g(x)$

$g(x) = x + 1$

$\Rightarrow$ **$f^{-1}(x) = ?$**

A) x B) $\frac{1}{x}$ C) $-x$ D) $-\frac{1}{x}$ E) $-\frac{1}{x^3}$

6. Uygun koşullarda tanımlı f ve g fonksiyonları için

$f(n) = n + \frac{1}{2}$

$g(n) = n + \frac{1}{4}$

aşağıdaki bağıntıların hangisi $Z \to Z$ bir fonksiyon belirtir?
Which of the following relations express a $Z \to Z$ function?

A) fofog B) fofof C) gofog
D) gogog E) gofogog

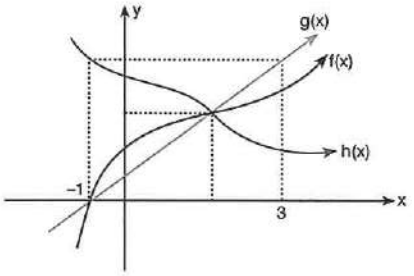
7. $(f + g)(x) = x^2 + 3x$

$(f - g)\left(\frac{x}{2}\right) = 4x + 4$

$\Rightarrow$ **$f(1) . g(1) = ?$**

A) 32 B) 24 C) 12 D) -28 E) -32

8. $-1 < a < 3,\ a \in R,$



I. $f(a) < g(a) \Rightarrow f(a) > h(a)$

II. $f(a) < h(a) \Rightarrow f(a) > g(a)$

III. $f(a) < h(a) \Rightarrow h(a) > g(a)$

ifadelerinden hangileri doğrudur?
Which of the statements is always true?

A) Yalnız I B) I ve III C) II ve III D) Yalnız III E) I, II ve III

9. $f(x) \cdot f(y) = f(x + y)$

$\dfrac{f(4)}{f(2)} = 3$

$\Rightarrow \dfrac{f(4) \cdot f(8)}{f(16)} = ?$

A) 81 B) 9 C) 1 D) $\dfrac{1}{9}$ E) $\dfrac{1}{81}$

10. $f, g : R \to R,\ a, b \in R$

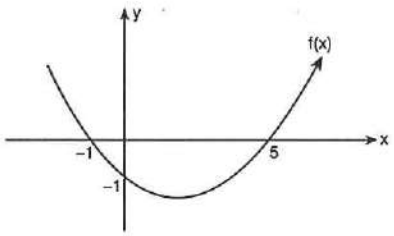
$f(x) = ax + 3,\quad (f + g)(2) = g(1)$

$g(x) = ax - b,\quad (f - g)(3) = f(0)$

$\Rightarrow g(4) = ?$

A) –4 B) –3 C) –2 D) 2 E) 4

11.

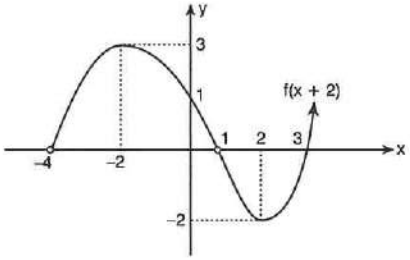


$$g(x) = \begin{cases} x + 4, & f(x) \geq 0 \\ 2x - 3, & f(x) < 0 \end{cases}$$

$\Rightarrow$ **gog(4) = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

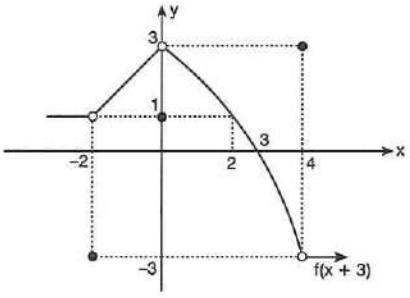
12.



$\Rightarrow \dfrac{f^{-1}(0) + f^{-1}(-2)}{f(2) + f(5)} = ?$

A) 3 B) 4 C) 6 D) 8 E) 9

13.



$\Rightarrow \dfrac{f(3) + f(1)}{f^{-1}(1) + f^{-1}(3)} = ?$

A) $-\dfrac{1}{2}$ B) $-\dfrac{1}{6}$ C) 2 D) 3 E) 5

1-D 2-D 3-A 4-C 5-B 6-C 7-E 8-E 9-D 10-A 11-B 12-E 13-B

1. $f: R \to R,$

$$f(x+3) = x+7$$

$\Rightarrow$ **$f(4) = ?$**

A) 11 B) 8 C) 7 D) 6 E) 3

2. $f: R \to R,$

$$f(x^2 - 4x) = x^2 + 4x + 5$$

$\Rightarrow$ **$f(-4) = ?$**

A) 19 B) 17 C) 13 D) 8 E) 5

3. $f: R \to R,$

$$f(x^3 + x^2) = x^3 + x^2 - 7$$

$\Rightarrow$ **$f(10) = ?$**

A) -7 B) -4 C) 3 D) 4 E) 7

4. $f: R \to R,$

$$f\left(\frac{x+4}{x-7}\right) = \frac{x-7}{x+4} + 3$$

$\Rightarrow$ **$f\left(\frac{1}{2}\right) = ?$**

A) $\frac{2}{5}$ B) $\frac{1}{2}$ C) $\frac{5}{2}$ D) $\frac{7}{2}$ E) 5

5. $f: R \to R,$

$$f(x) = \frac{x}{3} + 4$$

$\Rightarrow$ **$f^{-1}(x) = ?$**

A) $3x + 12$ B) $3x - 12$ C) $4x - 3$ D) $4x + 3$ E) $4x - 12$

6. $f: R \to R,$

$$xf(x) - 3 = 4x + f(x)$$

$\Rightarrow$ **$f^{-1}(x) = ?$**

A) $\frac{4x+3}{x-1}$ B) $\frac{x+3}{x-4}$ C) $\frac{x-3}{x-4}$ D) $\frac{4x-3}{x+1}$ E) $\frac{4x+1}{x-3}$

7. $f(x+5) = \begin{cases} 2x-3, & x \geq 4 \\ x-11, & x < 4 \end{cases}$

$\Rightarrow$ **$f^{-1}(19) + f^{-1}(-10) = ?$**

A) 22 B) 16 C) $\frac{31}{2}$ D) 15 E) $\frac{29}{2}$

8. $f(x) = 2^{x+2}$

f(2x + 3) ün f(x) türünden değeri nedir?

What is the value of f(2x + 3) in terms of f(x)?

A) $3f^2(x)$ B) $2f^3(x)$ C) $2f^2(x)$ D) $3f(x)$ E) $2f(x)$

9. $f(x) = ax + b$

$[f(x) \cdot g(x)] = x^2 + 4x + 3$

$g(x) = x + 1$

$\Rightarrow$ **f(4) . f(5) = ?**

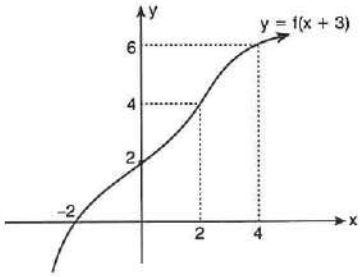
A) 12 B) 20 C) 30 D) 42 E) 56

10. $f : \{(1, 3), (2, 5), (3, 7)\}$

$\Rightarrow$ **f(1) + 2f(3) − f(2) = ?**

A) 12 B) 15 C) 17 D) 19 E) 20

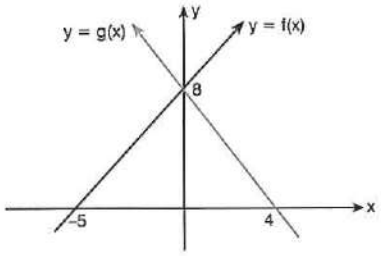
11.



$\Rightarrow \dfrac{f^{-1}(6) + f^{-1}(4)}{f(1) + f(3)} = ?$

A) 3 B) 4 C) 6 D) 7 E) $\dfrac{15}{2}$

12.



$\Rightarrow$ **fog(4) + f^{-1}og(0) = ?**

A) $\dfrac{8}{5}$ B) 5 C) 6 D) 8 E) 9

1-B 2-B 3-C 4-E 5-B 6-B 7-A 8-C 9-E 10-A 11-C 12-D

1. $f(x^2 + x + 1) = \dfrac{x + 4}{x + 1}$

$\Rightarrow$ $f\left(\dfrac{3}{4}\right) = ?$

A) 3 B) 5 C) 7 D) 9 E) 10

2. $f(x) = 3x - m$

$\Rightarrow$ **fofof(x) = ?**

A) $3x - m$ B) $3x + m$

C) $9x - 4m$ D) $9x - 2m$

E) $27x - 13m$

3. $f\left(\dfrac{3x^2 - 6x - 9}{x + 1}\right) = \dfrac{x - 2}{x + 1}$

$\Rightarrow$ **f(– 3) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

4. $f: A \to B,$

$f(x) = 3\sqrt{9 - x^2}$

$\Rightarrow$ **$A \cap B$ = ?**

A) $[-3, 3]$ B) $[0, 9]$ C) $[3, 9]$

D) $[-3, 9]$ E) $[0, 3]$

5. $n \in Z,$

$f(0) = 3$

$f(n + 2) = f(n) + 5$

$\Rightarrow$ **f(8) = ?**

A) 7 B) 10 C) 13 D) 18 E) 23

6. $f: R \to R,$

- Her $x \in [-5, 5]$ için $f(x) = |x|$
- Her $x \in R$ için $f(x) = f(x - 15)$

$\Rightarrow$ **f(– 133) = ?**

A) –4 B) –2 C) 0 D) 2 E) 4

7. $f(x) = \dfrac{(x-1).(x+1).x}{4}$

$g(x) = \dfrac{(x+2).(x+4)}{5}$

$g(x-2) = f(x+1)$

$\Rightarrow$ **min(x) = ?**

A) $-\dfrac{11}{2}$ B) $-\dfrac{11}{5}$ C) -2 D) $-\dfrac{1}{5}$ E) $\dfrac{1}{5}$

8. $f(x+5) = \dfrac{4}{7} + f(x+4)$

$f(42) = 55$

$\Rightarrow$ **f(0) = ?**

A) 20 B) 24 C) 31 D) 39 E) 53

9. $x = \dfrac{3-4f(x)}{1+5f(x)}$

$\Rightarrow$ $\mathbf{f^{-1}(4) = ?}$

A) $-\dfrac{17}{21}$ B) $-\dfrac{13}{21}$ C) $-\dfrac{1}{24}$ D) $\dfrac{1}{24}$ E) $\dfrac{13}{21}$

10. $f(x) = \dfrac{1}{x^2-7x+12}$

$\Rightarrow$ **f(5) + f(6) + f(7) + . . . + f(20) = ?**

A) $\dfrac{1}{17}$ B) $\dfrac{13}{17}$ C) $\dfrac{16}{17}$ D) $\dfrac{17}{18}$ E) $\dfrac{18}{19}$

11. $f(x) = f(x-y).f(y)$

$f\left(\dfrac{1}{2}\right) = 3$

$\Rightarrow$ **f(5) = ?**

A) 9 B) 9^2 C) 9^3 D) 9^4 E) 9^5

1-C 2-E 3-C 4-E 5-E 6-D 7-C 8-C 9-B 10-C 11-E

ÜNİTE 16

Unit 16

İşlem / Operation

1. $x \odot y = 2x + 2y - 1$

$\Rightarrow$ $1 \odot 4 = ?$

A) 10 B) 9 C) 8 D) 7 E) 6

2. $a \square b = a + 3b - a \,.\, b$

$\Rightarrow$ $(-1) \square 1 = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $x \triangle y = \frac{1}{x} + \frac{2}{y}$

$\Rightarrow$ $4 \triangle 8 = ?$

A) 12 B) 6 C) 2 D) 1 E) $\frac{1}{2}$

4. $a \odot b = a^b + b^a + 3$

$\Rightarrow$ $2 \odot 5 = ?$

A) 49 B) 51 C) 53 D) 57 E) 60

5. $\frac{2}{a} \square \frac{3}{b} = 2a + 8b + 5$

$\Rightarrow$ $\frac{1}{3} \square \frac{1}{4} = ?$

A) 113 B) 77 C) 47 D) $\frac{23}{3}$ E) 7

6. $2^m \bullet 3^n = m \,.\, n + m + n$

$\Rightarrow$ $16 \bullet 81 = ?$

A) 18 B) 20 C) 22 D) 24 E) 28

7. $m \,.\, n > 0$

$m^4 \bullet n^2 = 3m + 5n - 15$

$\Rightarrow$ $\max(81 \bullet 25) = ?$

A) -49 B) -39 C) -19 D) 19 E) 39

8. $a \triangle b = a \,.\, b - a$

$\Rightarrow$ $(2 \triangle 1) \triangle 1 = ?$

A) 0 B) -1 C) -2 D) -3 E) -4

9. $a \triangle b = (a \,.\, b - a - b)$

$\Rightarrow$ **$(-1) \triangle (-2) = ?$**

A) -2 B) -1 C) 0 D) 5 E) 6

10. $x \bigcirc y = \max(x^y, y^x)$

$\Rightarrow$ **$(-2) \bigcirc 4 = ?$**

A) 16 B) 8 C) $\frac{1}{2}$ D) $\frac{1}{8}$ E) $\frac{1}{16}$

11. $a \square b = \max(a \,.\, b,\ a + b)$

$a \triangle b = \min(a \,.\, b,\ a + b + 1)$

$\Rightarrow$ **$[(-1) \triangle 3] \square [(-2) \triangle (-3)] = ?$**

A) -7 B) -3 C) 3 D) 7 E) 12

12. $a \bullet b = \max\{2a - b,\ a^b\}$

$a \blacktriangle b = \min\{5a + b,\ 5a + 7b\}$

$\Rightarrow$ **$[-10 \blacktriangle 3] \bullet 0 = ?$**

A) 47 B) 1 C) 0 D) -47 E) -94

13. $a \star b = \begin{cases} a \,.\, b, & a > b \\ a^b, & a \le b \end{cases}$

$\Rightarrow$ **$(3 \star 4) \star 1 = ?$**

A) 82 B) 81 C) 64 D) 46 E) 13

14. $x! \square y! = \begin{cases} x!, & x > y \\ y!, & x \le y \end{cases}$

$\Rightarrow$ **$(2! \square 3!) \square (4! \square 2!) = ?$**

A) 120 B) 24 C) 6 D) 2 E) 1

15. Uygun koşullarda, (Under appropriate conditions)

$a \odot b = \begin{cases} \sqrt{a} - \sqrt{b}, & a > b \\ a^2 - b^2, & a \le b \end{cases}$

$\Rightarrow$ **$(8 \odot 2) \odot [(-3) \odot (-2)] = ?$**

A) -19 B) -21 C) -23 D) -25 E) -27

16. $a \,\text{☆}\, b = \begin{cases} \max(2a, 3b), & a > b \\ \min(a^b, b^{2a}), & a \le b \end{cases}$

$\Rightarrow$ **$(4 \,\text{☆}\, 3) \,\text{☆}\, (2 \,\text{☆}\, 3) = ?$**

A) 32 B) 30 C) 28 D) 24 E) 18

1-B 2-C 3-E 4-E 5-A 6-D 7-D 8-A 9-D 10-A 11-E 12-B 13-B 14-B 15-C 16-D

1. $x \square y = y \square x$

$x \square y = 2x + (m + 4)y + 5$

$\Rightarrow$ **m = ?**

A) 2 B) 1 C) −1 D) −2 E) −4

2. $a \odot b = b \odot a$

$a \odot b = 4a - (n + 1)b + a \cdot b$

$\Rightarrow$ **n ⊙ 2 = ?**

A) −22 B) −26 C) −28 D) −30 E) −38

3. $x \triangle y = 4x + 3xy + 4y - (y \triangle x)$

$\Rightarrow$ $2 \triangle \frac{1}{3} = ?$

A) 5 B) $\frac{16}{3}$ C) $\frac{17}{3}$ D) 6 E) $\frac{19}{3}$

4. $x \odot y - 4 = 7a + (2a - 3)x + (a + 4)y$

$x \odot y = y \odot x$

$\Rightarrow$ **10 ⊙ (− 11) = ?**

A) 42 B) 47 C) 53 D) 64 E) 67

5. $a \bullet b = \frac{1}{2}a + \frac{1}{2}b + 3ab + 2(b \bullet a)$

$\Rightarrow$ **a ● b = ?**

A) $a + b + 6ab$ B) $\frac{a}{2} + \frac{b}{2} + ab$

C) $\frac{3a}{2} + \frac{3b}{2} + 9ab$ D) $-a - b - 6ab$

E) $-\frac{a}{2} - \frac{b}{2} - 3ab$

6. $a \blacksquare b = 5a + b - 2(b \blacksquare a)$

$\Rightarrow$ **4 ■ 6 = ?**

A) 16 B) 14 C) 12 D) −12 E) −14

7. $(a - 2) \triangle (b - 3) = 4a + 4b + 10$

$\Rightarrow$ **b △ a = ?**

A) $4a + 4b + 30$ B) $4a + 4b + 20$

C) $4a + 4b + 11$ D) $3a + 3b + 10$

E) $3a + 3b + 40$

8. $a \bigcirc b = b \bigcirc a$

$a \bigcirc b = \frac{k \cdot a}{b} + \frac{(2k + 1)b}{a}$

$\Rightarrow$ $\frac{1}{2} \bigcirc \frac{1}{2} = ?$

A) −1 B) −2 C) −3 D) −4 E) $-\frac{9}{2}$

9. e: etkisiz eleman (identity element)

$x \square y = x + y + 11$

$\Rightarrow$ **e = ?**

A) 11 B) 8 C) 4 D) −8 E) −11

10. e: etkisiz eleman (identity element)

$a \triangle b = \frac{1}{2}a + \frac{1}{2}b + 4$

$\Rightarrow$ **e = ?**

A) −4 B) −2 C) −1 D) $-\frac{1}{2}$ E) Yok

11. e: etkisiz eleman (identity element)

$x \bigcirc y = 4x \,.\, y$

$\Rightarrow$ **e = ?**

A) $\frac{1}{4}$ B) 2 C) $\frac{5}{2}$ D) 3 E) 4

12. e: etkisiz eleman (identity element)

$a \bullet b = a + b + 4ab$

$\Rightarrow$ **e = ?**

A) −1 B) 0 C) 3 D) 4 E) 6

13. e: etkisiz eleman (identity element)

$x \bullet y = 4x + 4y + 3xy + 4$

$\Rightarrow$ **e = ?**

A) 2 B) 1 C) −1 D) −3 E) −4

14. e: etkisiz eleman (identity element)

$a \triangle b = 7a + 7b - 6ab - 7$

$\Rightarrow$ **e = ?**

A) 7 B) 1 C) −1 D) −6 E) −7

15. e: etkisiz eleman (identity element)

$a \odot b = \frac{a}{2} + \frac{b}{2} - \frac{ab}{2} + \frac{1}{2}$

$\Rightarrow$ **e = ?**

A) 2 B) 1 C) 0 D) −1 E) −2

16. $a \triangle b = 5a + 5b - kab - 5$

işleminin etkisiz elemanı varsa k = ?

What is k if the operation has an identity element?

A) 4 B) 2 C) 1 D) −2 E) −4

1-D 2-A 3-C 4-A 5-E 6-B 7-A 8-B 9-E 10-E 11-A 12-B 13-C 14-B 15-D 16-A

1. $x \bigcirc y = x + y + 2$

$\Rightarrow$ $3^{-1} = ?$

A) -8 B) -7 C) -5 D) 2 E) 5

2. $x \triangle y = x + y - 13$

$\Rightarrow$ $5^{-1} = ?$

A) 21 B) 23 C) 18 D) 17 E) 15

3. $a \square b = \dfrac{a \cdot b}{5}$

$\Rightarrow$ $15^{-1} = ?$

A) $\dfrac{1}{15}$ B) $\dfrac{3}{5}$ C) $\dfrac{5}{3}$ D) 15 E) 18

4. $a \bullet b = -3a - 3b + 4ab + 3$

$\Rightarrow$ $2^{-1} = ?$

A) $\dfrac{1}{2}$ B) $\dfrac{5}{4}$ C) $\dfrac{4}{5}$ D) $\dfrac{3}{5}$ E) $\dfrac{1}{5}$

5. $a \odot b = -a - b + 4ab + \dfrac{1}{2}$

$\Rightarrow$ $1^{-1} = ?$

A) $\dfrac{1}{3}$ B) $\dfrac{2}{3}$ C) 1 D) 2 E) 3

6. $a \blacksquare b = a + b - ab$

$\Rightarrow$ $(-3)^{-1} = ?$

A) $-\dfrac{4}{3}$ B) $-\dfrac{3}{4}$ C) $\dfrac{1}{4}$ D) $\dfrac{3}{4}$ E) $\dfrac{4}{3}$

7. $x \heartsuit y = x + 2y$

$\Rightarrow$ $3^{-1} = ?$

A) -3 B) -1 C) 0 D) 2 E) Yok

8. $a, b \in A$

$a \nabla b = \min\{a, b\}$

$A = \{0, 1, 2, 3, 4\}$

$\Rightarrow$ $4^{-1} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

9. $a \square b = \frac{3}{4}ab$

Yutan eleman nedir?
What is the null element?

A) 0 B) $\frac{1}{4}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) 4

10. $a \blacksquare b = a + b + 7ab$

Yutan eleman nedir?
What is the null element?

A) 0 B) $-\frac{1}{7}$ C) -1 D) -7 E) -9

11. $a \diamond b = 2a + 2b - ab - 2$

Yutan eleman nedir?
What is the null element?

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

12. $a \triangle b = a + b - 5ab$

$a \triangle b = b$

$\Rightarrow$ **b = ?**

A) 5 B) $\frac{1}{5}$ C) $-\frac{1}{5}$ D) -5 E) $-\frac{1}{10}$

13. $a, b \in A$

$A = \{1, 2, 3, 4, 5\}$

$a \heartsuit b = \max\{a, b\}$

Yutan eleman nedir?
What is the null element?

A) 1 B) 2 C) 3 D) 4 E) 5

14. $x, y \in A$

$A = \{0, 2, 4, 6, 8\}$

$x \bullet y = \min\{x, y\}$

Yutan eleman nedir?
What is the null element?

A) 0 B) 2 C) 4 D) 6 E) 8

15. $x \infty y = 6x + 6y + 5xy + 6$

$x \infty y = y$

$\Rightarrow$ **y = ?**

A) -6 B) -2 C) $-\frac{6}{5}$ D) -1 E) $\frac{5}{6}$

16. $\forall x \in R,\ y \in R$

$x \triangle y = y$

$\Rightarrow$ $y^{-1} = ?$

A) 0 B) 1 C) 10 D) Yok E) R

1-B 2-A 3-C 4-C 5-A 6-D 7-E 8-E 9-A 10-B 11-E 12-B 13-E 14-A 15-C 16-D

1., 2., 3., 4., 5., 6., 7. ve 8. soruları aşağıdaki tabloya göre cevaplayınız.

Answer the questions 1., 2., 3., 4., 5., 6., 7. and 8. according to the following table

∗	a	b	c	d	e
a	b	c	d	e	a
b	c	d	e	a	b
c	d	e	a	b	c
d	e	a	b	c	d
e	a	b	c	d	e

1. $a * (b * c) = ?$

A) a B) b C) c D) d E) e

2. $(b * a) * (b * c) * (b * d) = ?$

A) a B) b C) c D) d E) e

3. $(e * a) * (e * d) = ?$

A) a B) b C) c D) d E) e

4. **(∗) işleminin etkisiz elemanı nedir?**

What is the identity element of the operation (∗)?

A) a B) b C) c D) d E) e

5. $(a^{-1} * a^{-1}) = ?$

A) a B) b C) c D) d E) e

6. $(b * e^{-1})^{-1} * d^{-1} = ?$

A) a B) b C) c D) d E) e

7. $(c * a^{-1})^{-1} * (b^{-1} * e^{-1}) = ?$

A) a B) b C) c D) d E) e

8. $(m * a) * b^{-1} = c$

$\Rightarrow$ **m = ?**

A) a B) b C) c D) d E) e

9., 10., 11., 12., 13., 14., 15. ve 16. soruları aşağıdaki tabloya göre cevaplayınız.

Answer the questions 9., 10., 11., 12., 13., 14., 15. and 16. according to the following table

✱	0	1	2	3	4
0	3	4	0	1	2
1	4	0	1	2	3
2	0	1	2	3	4
3	1	2	3	4	0
4	2	3	4	0	1

9. $(2 ✱ 3) ✱ (1 ✱ 1) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

10. **✱ işleminin etkisiz elemanı kaçtır?**

What is the identity element of the operation (✱)?

A) 0 B) 1 C) 2 D) 3 E) 4

11. $(2 ✱ 3^{-1}) ✱ (3 ✱ 4) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

12. $(1 ✱ 2)^{-1} ✱ (3^{-1} ✱ 4^{-1}) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

13. $a ✱ a ✱ \ldots ✱ a = a^n$

$\Rightarrow 4^{15} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

14. $a ✱ a ✱ \ldots ✱ a = a^n$

$\Rightarrow (3^{-1})^{121} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

15. $(x ✱ 4) = 3^{-1} ✱ 1^{-1} ✱ 0^{-1}$

$\Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

16. $x ✱ 0 ✱ x = (1 ✱ 2) ✱ (3 ✱ 4) ✱ 1$

$\Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

1-A 2-D 3-E 4-E 5-C 6-D 7-A 8-D 9-B 10-C 11-E 12-A 13-C 14-B 15-C 16-B

1. $a \triangle b = \begin{cases} 2a + 4, & a > b \\ a + 2b, & a \leq b \end{cases}$

$\Rightarrow$ **(2 △ 3) △ 4 = ?**

A) 8 B) 14 C) 16 D) 20 E) 24

2. $5^{2a} \otimes \frac{10}{b} = 4a + 5b$

$\Rightarrow$ $\frac{1}{25} \otimes \frac{1}{2} = ?$

A) 104 B) 100 C) 96 D) 79 E) 71

3. $a \heartsuit b = a \cdot b + 2$

$\Rightarrow$ $4^{1 \heartsuit 2} \heartsuit 4^{2 \heartsuit 3} = ?$

A) 2^{24} B) $2^{24} + 2$ C) 2^{25} D) $2^{25} + 2$ E) 2^{26}

4. $a \nabla b = \begin{cases} a^2 - b^2, & a < b \\ a + b, & a = b \\ a^3 + b^3, & a > b \end{cases}$

$\Rightarrow$ **(− 2 ▽ 1) ▽ (1 ▽ 1) = ?**

A) 35 B) 36 C) 39 D) 41 E) 45

5. $m \in R$,

$a \square b = \frac{a(a + b)}{m}$

$\Rightarrow$ **(4m) □ (2 □ 1) = ?**

A) $16 + 24m$ B) $16 - 24m$ C) $\frac{16}{m} + \frac{24}{m^2}$ D) $16m + \frac{24}{m}$ E) $16 + \frac{24}{m}$

6. $k \in R$,

$a \triangle b = a^k \cdot b^k$

$\Rightarrow$ $\frac{4 \triangle 3}{2 \triangle 5} = ?$

A) 1 B) k C) $\frac{6}{5}$ D) $\left(\frac{5}{6}\right)^k$ E) $\left(\frac{6}{5}\right)^k$

7. $\frac{7}{a} \otimes \frac{b}{3} = 63a + b + 2$

$\Rightarrow$ **(49⊗3) = ?**

A) 9 B) 11 C) 18 D) 20 E) 22

8. $a \diamond b = 9a - 7b + 3$

$(x \diamond x) \diamond x = x$

$\Rightarrow$ **x = ?**

A) −3 B) −2 C) 2 D) 3 E) 4

9. $a \odot b = 9a - 7b + 4$

$(a \odot a) \odot (a \odot a) = -\dfrac{9}{a}$

$\Rightarrow$ **a = ?**

A) $-\dfrac{3}{2}$ B) $-\dfrac{2}{3}$ C) $-\dfrac{1}{3}$ D) $\dfrac{3}{2}$ E) $\dfrac{5}{2}$

10. $x \otimes y = \begin{cases} x + y, & |x| > |y| \\ x \,.\, y, & |x| = |y| \\ x - y, & |x| < |y| \end{cases}$

$\Rightarrow$ **$(-3 \otimes 3) \otimes (-2 \otimes 3) = ?$**

A) -5 B) -9 C) -14 D) -15 E) -17

11. $a \otimes b = 4(a \triangle b) + a + b$

$a \triangle b = 2a - 3b + 1$

$\Rightarrow$ **$(-1 \otimes 1) = ?$**

A) -20 B) -16 C) -12 D) -11 E) -9

12. $a \triangle b = (a \otimes b) \otimes 36$

$a \otimes b = 3^a \,.\, 2^b$

$\Rightarrow$ **$2 \triangle 2 = ?$**

A) 6 B) 36 C) 2^{16} D) 3^{26} E) 6^{36}

13.

★	1	2	3
1	1	2	3
2	2	3	1
3	3	2	1

$A = \{1, 2, 3\}$

kümesinde tanımlanmış ★ işlemi için aşağıdakilerden hangisi yanlıştır?

Which of the following is false for the operation ★ defined in set a?

A) İşlemin etkisiz elemanı 1 dir. (The identity element is 1)

B) İşlem A kümesine göre kapalıdır. (The operation is closed according to set A)

C) İşlemin birleşme özelliği vardır. (The operation have an associative feature)

D) $2^{-1} = 3$

E) Yutan eleman 3 tür. (The null element is 3.)

14.

⊗	a	b	c	d	e
a	b	c			a
b	c	d	e		
c				b	c
d		1			
e				2	

$A = \{a, b, c, d, e\}$

⊗ işlemi; kapalılık, etkisiz eleman, değişme ve birleşme özelliklerini sağlamaktadır.

Operation ⊗ : provides closur, identity element, associative and commutative features.

$\Rightarrow$ **(1, 2) = (?, ?)**

A) (e, b) B) (a, b) C) (c, d) D) (a, d) E) (a, e)

15.

⊙	1	2	3	4	5
1	2	3	4	5	1
2	3	4	5	1	2
3	4	5	1	2	3
4	5	1	2	3	4
5	1	2	3	4	5

$a \triangle b = (a \odot b) \odot 2$

$\Rightarrow$ **△ işleminin etkisiz elemanı kaçtır?**

What is the identity element of the operation (△)?

A) 1 B) 2 C) 3 D) 4 E) 5

1-D 2-C 3-B 4-A 5-D 6-E 7-D 8-A 9-A 10-C 11-B 12-E 13-E 14-D 15-C

1. $\dfrac{3}{x \triangle y} = \dfrac{1}{x} + \dfrac{1}{y}$

$\Rightarrow$ **$(1 \triangle 2) \triangle 2 = ?$**

A) 2 B) 3 C) 5 D) 6 E) 7

2. $a \otimes b = \dfrac{2ab}{a-b}$

$\dfrac{1}{3} \otimes \dfrac{2}{4} = \dfrac{1}{7} \otimes m$

$\Rightarrow$ **$m = ?$**

A) $\dfrac{2}{13}$ B) $\dfrac{1}{6}$ C) $\dfrac{2}{11}$ D) $-\dfrac{2}{11}$ E) $-\dfrac{2}{13}$

3. $(x, y) \otimes (m, n) = (x + m - 3, y \,.\, n - 4)$

$(4, 1) \otimes (m, n) = (2, 3)$

$\Rightarrow$ **$m + n = ?$**

A) 5 B) 6 C) 7 D) 8 E) 9

4. $(a + 1) \blacksquare (b - 1) = a \,.\, b + a + b$

$\Rightarrow$ **$a \blacksquare b = ?$**

A) $ab - a - b + 1$ B) $ab - a + b$

C) $ab + a + b + 1$ D) $ab + a + 1$

E) $ab + 2a - 1$

5. $a \odot b = EBOB(a, b)$

$a \ominus b = EKOK(a, b)$

$a \otimes b = EKOK(a \odot b, a \ominus b)$

$\Rightarrow$ **$18 \otimes 21 = ?$**

A) 3 B) 63 C) 72 D) 96 E) 126

6. $a \triangle b = \begin{cases} EKOK(a, b), & a \geq b \\ EBOB(a, b), & a < b \end{cases}$

$\Rightarrow$ **$(18 \triangle 24) \triangle (63 \triangle 42) = ?$**

A) 1 B) 3 C) 6 D) 63 E) 126

7. $(a, b) \triangle (c, d) = (ac + bd,\ ad + bc)$

işleminin etkisiz elemanı kaçtır?
What is the identity element?

A) (1, 0) B) (0, 1) C) (– 1, 0)

D) (0, – 1) E) (1, 1)

8. $\triangle a = a + 1$

$\triangle 5 + \triangle x-1 = \triangle 2x-1 + \triangle 2x$

$\Rightarrow$ **$x = ?$**

A) 1 B) $\dfrac{5}{3}$ C) 2 D) $\dfrac{7}{3}$ E) 3

9. $a \triangle b = a^2 + ab - a + b$

$a \neq b$ için $a \triangle b = b \triangle a$

$a \triangle b = b \triangle a$ for $a \neq b$

$\Rightarrow$ **$a + b = ?$**

A) -2 B) -1 C) 0 D) 1 E) 2

10. $a \otimes b = 3^a + b^3$

$1 \otimes (2 \otimes x) = 1003$

$\Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 10 E) 13

11.

$\otimes$	0	1	2	3	4
0	1	0	2	4	3
1	0	2	3	1	4
2	1	4	3	2	0
3	4	0	1	2	3
4	0	1	2	3	4

$A = \{0, 1, 2, 3, 4\}$

$A(a) = \{b \in A$ için $a \otimes b = b \otimes a\}$

$A(a) = \{a \otimes b = b \otimes a$ for $b \in A\}$

$\Rightarrow$ **$A(0) = ?$**

A) $\{1, 2\}$ B) $\{0, 1, 3\}$ C) $\{2, 3\}$ D) $\{2, 4\}$ E) $\{3, 1\}$

12. $(a, b) \otimes (c, d) = a \,.\, b + b^2 - c^2 + d \,.\, c$

$\Rightarrow$ **$(0, 1) \otimes (-1, 2) = ?$**

A) -1 B) -2 C) -3 D) -4 E) -5

13. $x \square y = 2xy + 2x + 2y + 1$

$\square$ işlemine göre, hangi elemanın tersi <u>yoktur</u>?

According the operation $\square$ which one of the elements below doesn't have an inverse element?

A) 2 B) 0 C) -1 D) -2 E) -3

14.

$\triangle$	M	U	R	A	T
M	R	A	T	M	U
U	A	T	M	U	R
R	T	M	U	R	A
A	M	U	R	A	T
T	U	R	A	T	M

$\Rightarrow$ **$(T^{-1} \triangle M)^{-1} \triangle (R^{-1} \triangle U^{-1})^{-1} \triangle A = ?$**

A) M B) U C) R D) A E) T

15. $a \triangle b = \begin{cases} a + b, & a \in Z,\ b \in Z \\ b, & a \notin Z,\ b \in Z \\ 0, & a \notin Z,\ b \notin Z \end{cases}$

$\Rightarrow$ **$(2 \triangle 3) \triangle \left(\frac{1}{4} \triangle 2\right) \triangle \left(\frac{1}{7} \triangle \frac{1}{6}\right) = ?$**

A) 3 B) 4 C) 5 D) 6 E) 7

16. $x \triangle y = 2x + 2y - 6 - (y \triangle x)$

$\Rightarrow$ **$5^{-1} \triangle 3 = ?$**

A) 1 B) 6 C) 7 D) 8 E) 11

1-B 2-B 3-D 4-E 5-E 6-C 7-A 8-B 9-E 10-A 11-B 12-B 13-C 14-E 15-E 16-A

ÜNİTE 17

Unit 17

Modüler Aritmetik / Modular Arithmetic

1. $18 \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

2. $1932 \equiv x \pmod 3$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

3. $19624 \equiv x \pmod{10}$

$\Rightarrow$ **x = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

4. $365 \equiv x \pmod{11}$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 5 E) 7

5. Z / 3,

$\Rightarrow$ $81 - 5^3 - 4^2 + 10^2 = ?$

A) −1 B) 0 C) 1 D) 2 E) 3

6. Z / 6,

$\Rightarrow$ $6^2 + 7^3 + 8^4 + 9^2 = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

7. Z / 7,

$\Rightarrow$ $\dfrac{-x-5}{3x+1} = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

8. Z / 4,

$\Rightarrow$ $\dfrac{x^2+3x+4}{5x-1} = ?$

A) x B) −x C) −x−1 D) −x + 1 E) 2x + 1

9. Z / 4,

$\Rightarrow \frac{1}{3} + \frac{3}{5} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

10. Z / 5,

$\Rightarrow 6^{-1} + 2^{-1} + 7^{-1} = ?$

A) 3 B) 2 C) 1 D) 0 E) −1

11. Z / 10,

$\Rightarrow 9^{-1} + \left(\frac{3}{2}\right)^{-1} + \left(\frac{3}{4}\right)^{-1} = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

12. Z / 8,

$\Rightarrow \frac{2}{5} \cdot \frac{1}{3} = ?$

A) 2 B) 4 C) 5 D) 6 E) 7

13. Z / 4,

$3x + 1 = 2$

$\Rightarrow x = ?$

A) $\frac{1}{3}$ B) 1 C) $\frac{3}{2}$ D) 2 E) 3

14. Z / 5,

$2x = 3$

$\Rightarrow x = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

15. Z / 7,

$(x - 3) . (x + 4) = 0$

$\Rightarrow$ S.S. = ?

A) $\{3, 4\}$ B) $\{3\}$ C) $\{4\}$ D) $\{1, 3\}$ E) $\{2, 3\}$

16. Z / 6,

$x^2 + 5x + 4 = 0$

$\Rightarrow$ S.S. = ?

A) $\{3, 5\}$ B) $\{5\}$ C) $\{2, 5\}$ D) $\{1, 2\}$ E) $\{2, 3\}$

1-D 2-A 3-E 4-C 5-C 6-B 7-B 8-A 9-C 10-B 11-A 12-D 13-E 14-A 15-B 16-C

1. Z / 5,

$$x^2 + \frac{1}{2}x - 3 = 0$$

$\Rightarrow$ **S.S. = ?**

A) $\{3\}$ B) $\{4\}$ C) $\{3, 4\}$ D) $\{1, 3\}$ E) $\{2, 4\}$

2. Z / 7,

$$2x + 4 = -x + 2$$

$\Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

3. Z / 5,

$$\left(x - \frac{1}{2}\right)\left(x + \frac{1}{3}\right) = 1$$

$\Rightarrow$ **S.S. = ?**

A) $\{2, 4\}$ B) $\{2, 3\}$ C) $\{3, 4\}$ D) $\{2\}$ E) $\{4\}$

4. Z / 4,

$$(x - 1).(x - 2).(x - 3) = 2$$

$\Rightarrow$ **S.S. = ?**

A) $\{0, 1\}$ B) $\{0\}$ C) $\{2, 3\}$ D) $\{0, 3\}$ E) $\varnothing$

5. Z / 5,

$$f(x) = 2\overline{x} + \overline{3}$$

$\Rightarrow$ **$f(\overline{1})$ = ?**

A) $\{\overline{0}\}$ B) $\{\overline{1}\}$ C) $\{\overline{2}\}$ D) $\{\overline{3}\}$ E) $\{\overline{4}\}$

6. Z / 6,

$$f(x) = x + \overline{3}$$

$\Rightarrow$ **$f^{-1}(\overline{4})$ = ?**

A) $\{\overline{0}\}$ B) $\{\overline{0}, \overline{1}\}$ C) $\{\overline{1}\}$ D) $\{\overline{2}\}$ E) $\{\overline{4}\}$

7. Z / 11,

$$f(x) = \overline{2}x + \overline{5}$$

$$f(x) = \overline{1}$$

$\Rightarrow$ **x = ?**

A) $\{\overline{2}\}$ B) $\{\overline{4}\}$ C) $\{\overline{6}\}$ D) $\{\overline{8}\}$ E) $\{\overline{9}\}$

8. Z / 7,

$$f(x) = \frac{\overline{3}x - \overline{4}}{\overline{5}}$$

$\Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\overline{4}x + \overline{1}$ B) $\overline{4}x - \overline{6}$ C) $\overline{3}x + \overline{1}$ D) $\overline{4}x + \overline{6}$ E) $\overline{4}x - \overline{2}$

9. Z / 9,

$f(x) = \overline{8}x + \overline{4}$

$g(x) = \overline{3}x + \overline{7}$

$\Rightarrow$ **fog(x) = ?**

A) $\overline{4}x + \overline{7}$ B) $\overline{7}x + \overline{8}$ C) $\overline{8}x + \overline{3}$ D) $\overline{3}x + \overline{6}$ E) $\overline{6}x + \overline{6}$

10. Z / 6,

$f(x) = \dfrac{x + \overline{4}}{\overline{5}}$

$g(x) = x + \overline{5}$

$\Rightarrow$ **fog^{-1}(x) = ?**

A) $\overline{5}x + \overline{1}$ B) $\overline{3}x + \overline{2}$ C) $x + \overline{2}$ D) $\overline{5}x + \overline{3}$ E) $x + \overline{1}$

11. Z / 4,

$f(x) = \overline{3}x + \overline{3}$

$\Rightarrow$ **fof(x) = ?**

A) x B) $x + \overline{1}$ C) $x + \overline{3}$ D) $\overline{3}x + \overline{1}$ E) $\overline{2}x + \overline{3}$

12. Z / 10,

$f(x) = \dfrac{\overline{4}x + \overline{6}}{\overline{3}x + \overline{7}}$

$\Rightarrow$ **f(x) = ?**

A) $\overline{9}x$ B) $\overline{2}x + \overline{3}$ C) $x + \overline{6}$ D) $\overline{2}$ E) $\overline{8}$

13. $193^{15} \equiv x \pmod 4$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

14. $162^{130} \equiv x \pmod 6$

$\Rightarrow$ **x = ?**

A) 5 B) 4 C) 3 D) 0 E) −4

15. $18469^{10} \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

16. $1234^{100} \equiv x \pmod{10}$

$\Rightarrow$ **x = ?**

A) 2 B) 4 C) 6 D) 7 E) 8

1-C 2-C 3-A 4-B 5-A 6-C 7-E 8-D 9-E 10-A 11-A 12-E 13-B 14-D 15-B 16-C

TEST 3

1. $(-2)^{147} \equiv x \pmod 7$

$\Rightarrow$ **x = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

2. $(-124)^{215} \equiv x \pmod 8$

$\Rightarrow$ **x = ?**

A) 0 B) 2 C) 4 D) 6 E) 7

3. $(-19)^{204} \equiv x \pmod 6$

$\Rightarrow$ **x = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

4. $(-13)^{-109} \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

5. $2^{193} \equiv \ldots x$

(2^{193} sayısının birler basamağı kaçtır?)

(What is the ones - digit of the number 2^{193}?)

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 4 D) 6 E) 8

6. $x \in Z^+$,

$2x \equiv 3 \pmod 5$

$\Rightarrow$ **min(x) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

7. $3x + 1 \equiv 5 \pmod 4$ ve x: rakam ise (x: digit)

$\Rightarrow$ **Σx = ?**

A) 14 B) 13 C) 12 D) 11 E) 10

8. $x < 0$,

$12x + 15 \equiv 3 \pmod 6$

$\Rightarrow$ **max(x) = ?**

A) −1 B) −2 C) −4 D) −5 E) −6

9. $f(x) = \begin{cases} 2x+3, & x \equiv 0 \pmod 4 \\ x, & x \equiv 1 \pmod 4 \\ -x-7, & x \equiv 2 \pmod 4 \\ x+1, & x \equiv 3 \pmod 4 \end{cases}$

$\Rightarrow$ **f(5) + f(6) + f(7) + f(8) = ?**

A) 16 B) 17 C) 18 D) 19 E) 20

10. $19^{15} + 20^{15} + 21^{15} + 22^{15} + 23^{15} \equiv x \pmod{21}$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 11 D) 13 E) 17

11. $1! + 2! + 3! + \ldots + 10! \equiv x \pmod 4$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

12. $(-31)^{121} + (-32)^{121} + (-33)^{121} + (-34)^{121} + \equiv x \pmod{32}$

$\Rightarrow$ **x = ?**

A) 0 B) 14 C) 16 D) 29 E) 31

13. Bir hemşire 10 günde bir nöbet tutmaktadır.

İlk nöbetini salı günü tuttuğuna göre, 21. nöbetini hangi gün tutmuştur?

If a nurse takes a shift once in every 10 days and if her first shift is on Tuesday, on which day of the week will be her 21st shift?

A) Cuma (friday) B) Cumartesi (Saturday)
C) Pazar (Sunday) D) Salı (Tuesday)
E) Çarşamba (Wednesday)

14. Bir ayakkabıcı 2 günde bir çift ayakkabı yapıp 1 gün ara vermektedir.

İlk ayakkabıyı pazartesi günü yapmaya başladığına göre, 10. çift ayakkabıyı hangi gün bitirebilir?

A shoemaker makes a pair of shoes every 2 days and takes a break for 1 day. If he started to make the first shoe on Monday. Which day can he finish the 10th pair of shoes?

A) Pazar (Sunday) B) Pazartesi (Monday)
C) Salı (Tuesday) D) Çarşamba (Wednesday)
E) Perşembe (Thursday)

15. 3 günde bir nöbet tutan bir doktor 29. nöbetini çarşamba günü tuttuğuna göre, ilk nöbetini hangi gün tutmuştur?

A doctor who takes a shift of work once in every 3 days, if this doctor takes her 29th shift in on Wednesday on which day of the week she took her first shift?

A) Perşembe (Thursday) B) Pazar (Sunday)
C) Pazartesi (Monday) D) Salı (Tuesday)
E) Çarşamba (Wednesday)

16. 6 günde bir nöbet tutan bir asker 75. nöbetini pazartesi günü tuttuğuna göre 28. nöbetini hangi gün tutabilir?

"If a soldier takes a shift of work once every 6 days and if his 75th shift is on Monday, then on which day of the week was his 28th shift?"

A) Cumartesi (Saturday) B) Pazar (Sunday)
C) Pazartesi (Monday) D) Salı (Tuesday)
E) Çarşamba (Wednesday)

1-A 2-A 3-D 4-C 5-B 6-E 7-C 8-A 9-D 10-A 11-B 12-A 13-B 14-C 15-E 16-A

1. $x + y = 3 \pmod 5$

$2x - y = 1 \pmod 5$

$\Rightarrow$ **$x - y \equiv$?**

A) 0 B) 1 C) 2 D) 3 E) 5

2. $3x - 4y = 1 \pmod 4$

$x + y = 2 \pmod 4$

$\Rightarrow$ **y = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

3. 2^{1912}

sayısının birler basamağındaki rakam kaçtır?

Which of the following is the ones digit of the number 2^{1912}?

A) 0 B) 2 C) 4 D) 6 E) 8

4. $\left(\left((26)^{4!}\right)^{5!}\right)^{6!}$

sayısının birler basamağındaki rakam kaçtır?

Which of the following is the ones digit of the number $\left(\left((26)^{4!}\right)^{5!}\right)^{6!}$ = ?

A) 9 B) 8 C) 7 D) 6 E) 5

5. $n \in N$,

$18^{4n+2} \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

6. $2^{183} \equiv x \pmod{15}$

$\Rightarrow$ **x = ?**

A) 2 B) 4 C) 8 D) 11 E) 14

7. $(-153)^{2020} \equiv x \pmod 8$

$\Rightarrow$ **x = ?**

A) 7 B) 6 C) 5 D) 3 E) 1

8. $6^{183} + 7^{183} + 8^{183}$

sayısının 7'ye bölümünden kalan kaçtır?

What is the remainder when the number $6^{183} + 7^{183} + 8^{183}$ is divided by 7?

A) 6 B) 5 C) 3 D) 1 E) 0

9. $x > 100$,

$3^x \equiv 2 \pmod 5$

$\Rightarrow$ **min(x) = ?**

A) 101 B) 102 C) 103 D) 104 E) 105

10. $x < 195$

$19^x \equiv 1 \pmod 7$

$\Rightarrow$ **max(x) = ?**

A) 189 B) 190 C) 191 D) 192 E) 193

11. $3^{6k+404} \equiv x \pmod 7$

$\Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

12. $n \in N$,

$6^{60n+1913} \equiv x \pmod 4$

$\Rightarrow$ **x = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

13. $18^{3k+169} \equiv x \pmod 7$

$\Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

14. $10 < x < 22$,

$x \equiv 3 \pmod 6$

$\Rightarrow$ Σx **= ?**

A) 12 B) 24 C) 30 D) 36 E) 37

15. $x \in N$, $x < 50$

$x + 1 \equiv 14 \pmod{15}$

$\Rightarrow$ Σx **= ?**

A) 13 B) 28 C) 43 D) 70 E) 84

16. $Z/4$,

$2x + 1 = 3$

$3y + 2 = 1$

$\Rightarrow$ **x . y = ?**

A) 1 B) 2 C) 3 D) 4 E) 6

1-D 2-B 3-D 4-D 5-A 6-C 7-E 8-E 9-C 10-D 11-A 12-E 13-B 14-D 15-E 16-A

1. $x^2 \equiv \overline{2} \pmod 7$

$\Rightarrow$ **S.S. = ?**

A) $\{\overline{5}, \overline{6}\}$ B) $\{\overline{3}, \overline{5}\}$ C) $\{\overline{4}, \overline{6}\}$ D) $\{\overline{2}, \overline{3}\}$ E) $\{\overline{3}, \overline{4}\}$

2. $0! + 1! + 2! + 3! + \ldots + 119! \equiv x \pmod{20}$

$x \equiv a \pmod 6$

$\Rightarrow$ **a = ?**

A) 15 B) 14 C) 5 D) 2 E) 1

3. $8^{81} + 7^{243} \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) 6 B) 4 C) 3 D) 2 E) 1

4. $k \in Z^+$,

$13^{6k+15} \equiv x \pmod 8$

$\Rightarrow$ **x = ?**

A) 1 B) 5 C) 6 D) 7 E) 8

5. $3^2 + 3^3 + 3^4 + \ldots + 3^{194} \equiv x \pmod{10}$

$\Rightarrow$ **x = ?**

A) 1 B) 4 C) 7 D) 8 E) 9

6. $9x^2 \equiv 1 \pmod 4$

$\Rightarrow$ **S.S. = ?**

A) $\{1\}$ B) $\{3\}$ C) $\{4\}$ D) $\{1, 3\}$ E) $\{3, 4\}$

7. $x \in N$,

$(2020)^x \equiv 4 \pmod 6$

$\Rightarrow$ **min(x) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

8. $(8124)^{8124} \equiv x \pmod 9$

$\Rightarrow$ **x = ?**

A) 0 B) 2 C) 4 D) 6 E) 8

9. $(146)^{146} + (147)^{147} + (148)^{148} \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

10. Saat tam olarak 8 iken akrep 8'de, yelkovan 12'dedir.

Buna göre, 1712 saat sonra akrep hangi sayının üzerinde olur?

When it is exactly 8 o'clock. The hour hand is on 8 and the minute hand is on 12.

Accordingly, on which number will be the hour hand after 1712 hours?

A) 3 B) 4 C) 6 D) 7 E) 8

11. x iki basamaklı bir sayı, (x is two - digit number)

$x \equiv 3 \pmod 5$

$x \equiv 4 \pmod 6$

$\Rightarrow$ **max(x) = ?**

A) 92 B) 90 C) 88 D) 84 E) 78

12. $a \in Z^+,\ a \neq 1,$

$18 + 2a \equiv 0 \pmod a$

$\Rightarrow$ Σa **= ?**

A) 39 B) 38 C) 36 D) 33 E) 27

13. $x \in Z^+,\ x > 1,$

$x^2 + 3x + 10 \equiv 0 \pmod x$

Kaç tane x değeri vardır?

How many x values are there?

A) 3 B) 4 C) 6 D) 8 E) 10

14.
$$f(x) = \begin{cases} x^2, & x \equiv 0 \pmod 3 \\ x+1, & x \equiv 1 \pmod 3 \\ x-1, & x \equiv 2 \pmod 3 \end{cases}$$

$$g(x) = \begin{cases} 3x+3, & x \equiv 0 \pmod 2 \\ 4x-5, & x \equiv 1 \pmod 2 \end{cases}$$

$\Rightarrow$ $f[g[f(5)]]$ **= ?**

A) 15 B) 17 C) 54 D) 225 E) 256

15. $k \in Z^+,$

$5k - 4 \equiv 0 \pmod 3$

k < 30 $\Rightarrow$ kaç adet k değeri vardır?

How many k values are there?

A) 10 B) 11 C) 12 D) 13 E) 14

16. $x, y \in Z^+,$

$4^x \equiv 2 \pmod 7$

$3^y \equiv 1 \pmod{11}$

$\Rightarrow$ **min(x + y) = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

1-E 2-D 3-E 4-B 5-E 6-D 7-B 8-A 9-E 10-B 11-C 12-B 13-A 14-D 15-A 16-B

1. Z / 6,

$(\overline{3}x + \overline{2}) \cdot (x + \overline{4}) = \overline{0}$

$\Rightarrow$ **S.S. = ?**

A) $\{\overline{0}\}$ B) $\{\overline{1}\}$ C) $\{\overline{2}\}$ D) $\{\overline{1}, \overline{2}\}$ E) $\{\overline{2}, \overline{3}\}$

2. Z / 11,

$x^2 - \overline{5}x - \overline{3} = 0$

$\Rightarrow$ **S.S. = ?**

A) $\{\overline{1}, \overline{7}\}$ B) $\{\overline{7}, \overline{9}\}$ C) $\{\overline{3}, \overline{5}\}$ D) $\{\overline{8}, \overline{9}\}$ E) $\{\overline{1}, \overline{7}, \overline{10}\}$

3. Z / 8,

$f(x) = \overline{3}x - \overline{2}$

$\Rightarrow$ $\mathbf{f^{-1}(\overline{4}) = ?}$

A) $\overline{7}$ B) $\overline{5}$ C) $\overline{4}$ D) $\overline{2}$ E) $\overline{1}$

4. Z / 7,

$f(x) = \overline{3}x + \overline{1}$

$g(x) = x - \overline{7}$

$fog(x) = \overline{2}$

$\Rightarrow$ **x = ?**

A) $\overline{2}$ B) $\overline{3}$ C) $\overline{4}$ D) $\overline{5}$ E) $\overline{6}$

5. $A = \{m \in N,\ 143 \equiv 3 \pmod{m},\ m \neq 1\}$

$\Rightarrow$ **n(A) = ?**

A) 12 B) 11 C) 10 D) 8 E) 6

6. $2^{141} \equiv x \pmod{15}$

$\Rightarrow$ **x = ?**

A) 14 B) 13 C) 2 D) 1 E) 0

7. $n \in N$,

$(-5)^n \equiv 3 \pmod{11}$

$\Rightarrow$ **min(n) = ?**

A) 7 B) 5 C) 4 D) 2 E) 1

8. **2017 yılında doğum gününü pazartesi kutlayan bir kişi 2021 yılında doğum günü hangi gün kutlar?**
A person who celebrates his birthday in 2017 on Monday. What day does he celebrate his birthday in 2021?

A) Salı (Tuesday)
B) Çarşamba (Wednesday)
C) Perşembe (Thursday)
D) Cuma (Friday)
E) Cumartesi (Saturday)

9. $a, b \in Z^+$,

$3^a \cdot 4^b \equiv 0 \pmod{18}$

$3^b \cdot 4^a \equiv 0 \pmod{96}$

$\Rightarrow$ **min(a + b) = ?**

A) 11 B) 9 C) 6 D) 4 E) 3

10. $a, b, c \in Z^+$,

$5^a \cdot 3^b \cdot 2^c \equiv 0 \pmod{90}$

$5^b \cdot 3^c \cdot 2^a \equiv 0 \pmod{120}$

$\Rightarrow$ **min(a + b + c) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

11. $n \in Z^+$, $n > 1$,

$101 \equiv 5 \pmod{n}$

$80 \equiv 8 \pmod{n}$

$\Rightarrow$ **Σn = ?**

A) 60 B) 59 C) 50 D) 44 E) 36

12. $1^{11} + 2^{11} + 3^{11} + 4^{11} + \ldots + 11^{11} \equiv x \pmod{12}$

$\Rightarrow$ **x = ?**

A) 0 B) 6 C) 7 D) 9 E) 11

13. $a, b \in N$,

$3 \cdot a \equiv 2 \pmod{10}$

$8 \cdot b \equiv 3 \pmod{13}$

$\Rightarrow$ **min(a + b) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

14. $m \equiv 3 \pmod{11}$

$n \equiv 4 \pmod{11}$

$3m + 4n \equiv x \pmod{11}$

$\Rightarrow$ **x = ?**

A) 0 B) 3 C) 6 D) 9 E) 11

15. $a \equiv 2 \pmod{7}$

$b \equiv 4 \pmod{7}$

$a \cdot b + 6 \equiv x \pmod{7}$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 5

16. $Z / 49$,

$(48)^{1000} \equiv x$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 24 D) 47 E) 49

1-C 2-B 3-D 4-D 5-B 6-C 7-D 8-E 9-D 10-E 11-B 12-A 13-C 14-B 15-A 16-B

ÜNİTE 18

Unit 18

Problemler / Problems

1. **1 fazlasının yarısı 4 olan sayı kaçtır?**

Half of 1 more than which number 4?

A) 5 B) 6 C) 7 D) 8 E) 9

2. **3 katının 2 eksiği 7 olan sayı kaçtır?**

If 2 less than 3 times a number is 7, what is the number?

A) 3 B) 4 C) 5 D) 6 E) 7

3. **4 katının 5 fazlası 29 ise bu sayı kaçtır?**

If 5 more than 4 times a number is 29, what is the number?

A) 5 B) 6 C) 7 D) 8 E) 9

4. **Hangi sayının $\frac{1}{3}$ ü ile $\frac{1}{4}$ ünün toplamı 35 tir?**

The sum of $\frac{1}{3}$ and $\frac{1}{4}$ of which number is 35?

A) 12 B) 20 C) 30 D) 54 E) 60

5. **Hangi sayının 3 katı, aynı sayının 10 fazlasına eşittir?**

3 times of which number is equal to 10 more than the same number?

A) 4 B) 5 C) 6 D) 7 E) 8

6. **Hangi sayının $\frac{1}{4}$ ünün 2 fazlası, aynı sayının $\frac{1}{5}$ inin 3 eksiğine eşittir?**

2 more than $\frac{1}{4}$ of which number is equal to 3 less than $\frac{1}{5}$ of the same number?

A) −4 B) −20 C) −44 D) −80 E) −100

7. **Hangi sayının yarısının yarısı ile aynı sayının 2 katının toplamı − 18 e eşittir?**

If the sum of half of half the number and 2 times the same number is − 18, what is the number?

A) 8 B) 4 C) −4 D) −8 E) −10

8. **Hangi sayının karesi ile aynı sayının 6 katının toplamı − 9 a eşittir?**

If the sum of the square of a number and 6 times of the same number is − 9, what is the number?

A) −3 B) −1 C) 1 D) 3 E) 5

9. Toplamları 43 olan iki sayıdan büyük olan sayı ile küçük olan sayının farkı 13 ise büyük sayı kaçtır?

If the sum of two numbers is 43 but the difference of the same numbers is 13. What is the bigger number?

A) 56 B) 44 C) 36 D) 28 E) 24

10. Karelerinin farkı 54 olan iki sayının farkı 3 ise toplamları kaçtır?

If the difference of the squares of two numbers is 54 but the difference of the same numbers is 3. What is the sum of these numbers?

A) 16 B) 18 C) 20 D) 24 E) 26

11. Toplamları 83 olan iki sayıdan büyük sayı, küçük sayıya bölündüğünde bölüm 4 kalan 3 tür.

Buna göre, büyük sayı kaçtır?

The bigger of two numbers is divided by the smaller one, obtained quotient and remainder are respectively 4 and 3. If the sum of these two numbers is 83.

Accordingly, what is the biggest number?

A) 16 B) 24 C) 48 D) 64 E) 67

12. Farkları 3 olan iki sayının çarpımı 108 ise büyük sayı kaçtır?

If the difference of two numbers is 3 but the product of the same numbers is 108.

What is the bigger number?

A) 9 B) 10 C) 12 D) 14 E) 15

13. Ardışık 5 çift sayının toplamı 70 ise ortanca sayı ile en küçük sayının toplamı kaçtır?

The sum of 5 even consecutive numbers is 70.

Accordingly, what is the sum of the median and the smallest number?

A) 24 B) 26 C) 28 D) 30 E) 34

14. Toplamları 73 olan 3 sayıdan ortanca sayı küçük sayıdan 3 fazla, büyük sayıdan 16 eksiktir.

Buna göre, büyük sayı kaçtır?

The sum of three numbers is 73. The median of these numbers is 3 more than the smallest number but 16 less than the biggest number.

Accordingly, what is the bigger number?

A) 17 B) 20 C) 30 D) 36 E) 39

15. Bir sınıftaki kız ve erkek öğrencilerin toplamı sayısı 33 tür. Sınıftan 3 kız öğrenci ayrılınca kız öğrenci sayısı erkek öğrenci sayısına eşit olmaktadır.

Buna göre, başlagınça sınıfta kaç kız öğrenci vardır?

The number of male and female students in a class is 33. If 3 female students leave the class, the numbers of male students and female students will be equal.

Accordingly, how many female students were in the class at the beginning?

A) 15 B) 18 C) 21 D) 24 E) 27

16. 3 kalem ve 1 defterin fiyatı 14 liradır. 2 defter ve 3 silginin fiyatı ise 13 liradır.

Buna göre, 1 kalem, 1 silgi ve 1 defterin fiyatı kaç liradır?

The price of 3 pencils and 1 notebook is 14 TL. The price of 2 notebooks and 3 erasers is 13 TL.

Accordingly, what is the price of 1 pencil, 1 eraser and 1 notebook?

A) 9 B) 15 C) 21 D) 24 E) 27

1-C 2-A 3-B 4-E 5-B 6-E 7-D 8-A 9-D 10-B 11-E 12-C 13-A 14-D 15-B 16-A

1. Bir kümesteki tavukların sayısı ördeklerin sayısının yarısıdır. 8 ördek satıldığında ise kalan tavuk ve ördeklerin sayısı eşit olmaktadır.

Buna göre, başlangıçta kümeste kaç kanatlı hayvan vardır?

In a coop, the number of chicken is the half of the number of ducks. If 8 ducks are sold, the numbers of chicken and ducks will be the same.

Accordingly, how many chicken and ducks were there in the coop at the beginning?

A) 8 B) 16 C) 20 D) 24 E) 30

2. Kadın ve erkeklerden oluşan bir gezi grubu 49 kişidir. Gruba 11 kadın daha ilave olduğunda gruptaki erkek sayısı grubun $\frac{1}{3}$ üne eşit olmaktadır.

Buna göre, başlangıçta grupta kaç kadın vardır?

A group of 49 people consists of men and women. If 11 women are added to the group, the ratio of men in this group will become $\frac{1}{3}$.

Accordingly, how many women were there in the group at the beginning?

A) 20 B) 29 C) 31 D) 40 E) 41

3. Bir anaokulunda 3 yaşında 12 çocuk, 4 yaşında 15 çocuk vardır.

Buna göre, bu anaokuluna 3 yaşında kaç çocuk daha gelirse 3 yaşındaki çocukların yaşlarının toplamı 4 yaşındaki çocukların yaşları toplamına eşit olur?

In a kindergarten, there are 12 three years old children and 15 four years old children.

Accordingly, how many three years old children have required for the sum of the ages of three years old children to be equal to the sum of four years old children?

A) 8 B) 10 C) 12 D) 14 E) 16

4. Hergün bir önceki günden 5 sayfa fazla kitap okuyan bir öğrenci kitabı 8 günde bitirmiştir.

Kitabın $\frac{1}{3}$ ü 60 sayfa olduğuna göre, öğrenci ilk 3 gün kaç sayfa kitap okumuştur?

A student had read 5 more pages than the previous day and finished a book in 8 days.

If $\frac{1}{3}$ of this book is 60 pages, how many pages did he read in the first 3 days?

A) 15 B) 25 C) 30 D) 45 E) 50

5. Her birinin içinde 18 adet çikolata bulunan 15 paket çikolata vardır.

Toplamdaki çikolata sayısı değişmemek koşuluyla her bir paketin içindeki çikolata sayısı 12 arttırılsaydı paket sayısı kaç azalırdı?

There are 15 boxes each of which contains 18 chocolates.

If the number of chocolates in each box is increased by 12, how many boxes are decreased?

A) 6 B) 7 C) 9 D) 11 E) 14

6. Her gün 12 lira mutfak masrafı çıkaran bir ev hanımı elindeki parayla 77 günlük mutfak masrafını karşılamaktadır.

Buna göre, mutfak masrafı 14 liraya çıktığında toplamda aynı parayla kaç günlük mutfak masrafı karşılanabilir?

If a housewife meets daily expenses of the kitchen by 12 TL, her money is sufficient for 77 days.

If daily expenses of the kitchen are to 14 TL.

Accordingly, how many days does her money suffice for these expenses?

A) 69 B) 66 C) 59 D) 55 E) 49

7. Bir sinema salonunda yan yana 3 kişilik ve 2 kişilik sinema koltukları vardır. 3 kişilik ve 2 kişilik koltuk sayısı 15 tir.

Bu koltuklara toplam 38 kişi oturabildiğine göre, 2 kişilik koltuk sayısı kaçtır?

In a cinema, there are two types of seats. There are seats for 2 and seats for 3 people. The number of all seats is 15.

If 38 people can sit in these seats, what is the number of the seats for 2 people?

A) 6 B) 7 C) 8 D) 10 E) 11

8. Alya'nın parası Maya'nın parasının 5 katıdır. Alya kendi parasından 1000 TL yi Maya'ya verdiğinde Alya'nın parası Maya'nın parasının 2 katı olmaktadır.

Buna göre, başlangıçta Alya'nın kaç lirası vardır?

Alya's money is 5 times Maya's money. If Alya gives 1000 TL to Maya, Alya's money will become 2 times Maya's money.

Accordingly, how much money does Alya have at the beginning?

A) 1000 B) 3000 C) 3500 D) 5000 E) 7000

9. İçinde 2 kalem olan bir paketin fiyatı 5 TL, 3 kalem olan bir paketin fiyatı 7 TL olan bir kırtasiyede 15 paket kalem vardır.

Tüm kalemler satıldığında toplam 85 lira elde edildiğine göre bu kırtasiyede içinde 2 kalem olan paket sayısı kaçtır?

There are two types of packages of pencils in a stationary. The price of the package of 2 pencils is 5 TL, and the price of the package of 3 pencils is 7 TL.

If there are totally 15 packages and all packages cost 86 TL, how many of them are packages of 2 pencils?

A) 5 B) 7 C) 10 D) 11 E) 12

10. Bir çocuk merdivenleri 4'er 4'er çıkıp 2'şer 2'şer inmektedir. Çocuğun merdivenleri çıkarken attığı adım sayısı, inerken attığı adım sayısından 7 eksiktir.

Buna göre, bu merdivenin kaç basamağı vardır?

A child climbs a ladder up taking 4 stairs at a time where as he climbs the ladder down taking 2 stairs at a time. The number of steps the child takes while climbing up is 7 less than the number of steps he takes while climbing down.

Accordingly, how many stairs does the ladder have?

A) 14 B) 21 C) 28 D) 35 E) 37

11. Her saat sonunda toplam ağırlığının 3 katına ulaşan bir bakteri türü 5. saatin sonunda 243 kiloya ulaşmıştır.

Buna göre, bakterilerin 3 saatin sonundaki ağırlığı kaç kilogramdır?

The weight of bacteria species is increased to 3 times of its weight at the end of each hour. If its weight is 243 kilos at the end of 5 th hour.

What is its weight at the end of 3 rd hour?

A) 1 B) 3 C) 9 D) 27 E) 81

12. Her yıl boyu 3 kat artan bir bambu ağacının 10. yılın sonundaki boyu 100 cm dir.

Buna göre, bambu ağacının 13. yılın sonunda boyu kaç santimetre olur?

The length of a bamboo grows by 3 times its length each year. If the length of the bamboo is 100 cm at the end of the 10 th years.

What is the length of this bamboo at the end of the 13th years?

A) 6400 B) 2700 C) 1600 D) 900 E) 400

1-D 2-B 3-A 4-C 5-A 6-B 7-B 8-D 9-C 10-C 11-D 12-A

1. Zeynep bir fatura kuyruğunda baştan 13., Sümeyra ise sondan 14. dür. Sümeyra ve Zeynep arasında 7 kişi vardır.

Kuyruktaki kişi sayısı en çok x, en az y ise (x + y) kaçtır?

While Zeynep is the 13 th from the head of an invoice queue, Sümeyra is the 14 th from the end of the same queue. There are 7 people between them.

If the maximum and minimum numbers of people in this queue are x and y, what is the value of sum (x + y)?

A) 18 B) 24 C) 34 D) 42 E) 52

2. 4 yanlışın 1 doğruyu götürdüğü bir sınavda 72 soru vardır. Her soruyu cevaplayan Esra sınavda 42 net yapmıştır.

Buna göre, Esra'nın doğru işaretlediği soru sayısı kaçtır?

In an exam consisting of 72 questions, 4 incorrect answers cancel 1 correct answer. If Esra answered all the questions and got 42 net score.

How many questions does she answer correctly?

A) 24 B) 28 C) 30 D) 36 E) 48

3. 100 soruluk bir sınavda Büşra 5 soruyu boş bırakmıştır. Her doğru soruya 2 puan verilen ve her yanlış soru içinde 1 puan silinen bu sınavda Büşra 109 puan almıştır.

Buna göre, Büşra kaç soruyu doğru işaretlemiştir?

There are 100 questions in an exam and only 5 of them left empty by Büşra. Each correct arswer is awarded by 2 points, and 1 point is subtracted for each incorrect answer.

If Büşra has got 109 points in this exam, how many questions does she answer correctly?

A) 71 B) 68 C) 48 D) 39 E) 33

4. Bir baba belli bir miktar toprağını 7 çocuğuna eşit miktarda miras olarak bırakmıştır. Ancak çocuklardan ikisi kendi paylarından vazgeçince kalanlara, eskiye göre 18 dönüm daha fazla toprak kalmıştır.

Buna göre, babanın bıraktığı toplam toprak kaç dönümdür?

7 equal portions of land are inherited from a father to his children. Because 2 of the children gave up their portions, the other 5 children gain additional 18 acres of land.

Accordingly, how many acres of land are inherited from the father?

A) 315 B) 305 C) 280 D) 275 E) 260

5. Her yıl kendi boyutu kadar büyüyen bir havuz bitkisi havuzu 14 yılda tamamen doldurmuştur.

Buna göre, bitki havuzunun yarısı kaçıncı yılın sonunda dolmuştur?

A pond plant which grows as much as its size every year filled the pool in 14 years.

Accordingly, at the end of which year, did this this plant fill the half of the pool?

A) 13 B) 12 C) 11 D) 7 E) 6

6. Türkan parasının tamamıyla 3 ev ve 4 yat alabiliyor ya da 2 ev ve 7 yat alabiliyor.

Buna göre, Türkan parasının tamamıyla kaç tane yat alabilir?

Turkan can buy either 3 houses and 4 yachts or 2 houses and 7 yachts.

Accordingly, how many yachts can Turkan buy with the same amount of money?

A) 8 B) 9 C) 11 D) 13 E) 15

7. Bir tahtayı 7 parçaya ayırmak için 12 dakika harcayan bir marangoz aynı tahtayı 14 parçaya ayırmak için kaç dakika harcar?
A carpenter spends 12 minutes to divide a wood into 7 pieces. How many minutes does he need to divide the the same wood into 14 pieces?

A) 28 B) 26 C) 24 D) 23 E) 21

8. Melike indirim zamanı 2 gömlek 2 tişört ve 8 etek için 200 TL ödemiştir. Bunun yerine Melike 4 gömlek, 16 tişört ve 16 etek alsaydı 700 TL ödeyecekti.

Buna göre, 1 tişörtün fiyatı kaç TL dir?
Melike paid 200 TL for 2 shirts, 2 t-shirts and 8 skirts. If she buys 4 shirts, 16 t-shirts and 16 skirts, she will pay 700 TL.

Accordingly, what is the price of 1 t-shirt?

A) 36 B) 32 C) 30 D) 25 E) 24

9. Herkesin birbirine hediye aldığı 10 kişilik bir grupta toplam kaç hediye alınmıştır?
Everyone in a group of 10 people buys a giff to each other.

How many total gifts are bought in this group?

A) 45 B) 75 C) 90 D) 99 E) 100

10. Kare şeklindeki bir futbol sahasının etrafına aydınlatma için elektrik direkleri dikilecektir. Her bir elektrik direği eşit aralıklarla dikilecektir ve herbirinin maliyeti 500 TL dir. Toplam maliyet 30000 TL dir ve her iki direk arasındaki mesafe 5 metredir.

Buna göre, futbol sahasının çevresi kaç metredir?
For lighting, lampposts are planted around a square - shaped football field. Each of lampposts is planted with equal intervals and one cost 500 TL, the total cost is 30000 TL and the distance between any two lampposts is 5 m.

Accordingly, what is the perimeter of this football field?

A) 30 B) 180 C) 240 D) 270 E) 300

11. Herkesin birbiriyle sadece bir kez tokalaştığı bir ortamda 91 kez tokalaşma meydana gelmiştir.

Buna göre, bu ortamda kaç kişi vardır?
Everyone shakes hands only once each other. If a total of 91 handshakes are occurred, how many people are there?

A) 14 B) 13 C) 12 D) 11 E) 10

12. 180 metre uzunluğundaki bir sokağın her iki tarafına başta ve sonda mutlaka birer tane olmak üzere sokak lambası dikilecektir. Her sokak lambasının arası eşit uzaklıkta ve 10 metre olacaktır.

Buna göre, sokağa kaç adet lamba dikilebilir?
The length of a street is 180 m. Street lamps are planted equally with 10 m intervals including both ends of this street.

Accordingly, how many lamps are planted in the street?

A) 36 B) 38 C) 40 D) 45 E) 48

13. Her su dolu şişenin maliyetinin 6 TL olduğu bir markette boş şişenin iadesine karşı 2 TL geri ödenmektedir.

Buna göre, 20 şişe su almaya parası yeten bir kişi <u>en çok</u> kaç şişe su tüketebilir?
In a store, a bottle of water costs 6 TL and there is 2 TL refund for bringing an empty bottle back.

Accordingly, if someone can offord 20 bottles of water, how many bottles of water <u>at most</u> can that person get?

A) 30 B) 29 C) 28 D) 27 E) 26

14. 8 adım ileri 5 adım geri atarak ilerleyen bir böcek türü 100 adım attığında kaç adım ilerlemiş olur?
If an insect takes 8 steps forward but 5 steps backward, it takes a total of 100 steps.

Accordingly, how many steps does it move forward?

A) 28 B) 27 C) 25 D) 24 E) 21

1-E 2-E 3-B 4-A 5-A 6-D 7-B 8-D 9-C 10-E 11-A 12-B 13-B 14-A

1. **$\frac{3}{11}$ i 30 olan sayının $\frac{1}{55}$ i kaçtır?**

If $\frac{3}{11}$ of a number is 30, what is the $\frac{1}{55}$ of the number?

A) 2 B) 4 C) 10 D) 15 E) 22

2. **$\frac{1}{8}$ ile $\frac{2}{7}$ sinin toplamı 69 olan sayının $\frac{1}{14}$ ü kaçtır?**

If $\frac{1}{8}$ of and $\frac{2}{7}$ of a number sum up to 69, what is the $\frac{1}{14}$ of the number?

A) 56 B) 28 C) 14 D) 12 E) 11

3. Bir kesrin değeri $\frac{2}{7}$ dir. Bu kesrin payına 2 ekler, paydasından 3 çıkarırsak kesrin değeri 1 olmaktadır.

Buna göre, başlangıçta kesrin pay ve paydasının çarpımı kaçtır?

The value of a fraction is $\frac{2}{7}$. If 2 is added to its numerator and 3 is subtracted from its denominator, the value of this fraction will become 1.

Accordingly, what is the product of the numerator and the denominator of this fraction at the beginning?

A) 64 B) 56 C) 42 D) 28 E) 14

4. **Nilüfer parasının $\frac{8}{13}$ ile tanesi 10 lira olan 24 adet çikolata aldığına göre parasının tamamıyla kaç adet çikolata alabilirdi?**

Nilufer spends $\frac{8}{13}$ of her money to buy 24 chocolates. Each chocolate costs 10 TL. How many chocolates can she buy with all of her money?

A) 40 B) 39 C) 37 D) 33 E) 31

5. Bir dil kursundaki insanların $\frac{3}{7}$ si uzak doğuludur. Kurstan 34 uzak doğulu insan ayrıldığında kalan kişilerin $\frac{1}{8}$ i uzak doğulu olmaktadır.

Buna göre, başlangıçta kursta kaç kişi vardır?

In a language course, $\frac{3}{7}$ of people are from far east. If 34 people from far east leave the course, $\frac{1}{8}$ of remainder are from far east.

Accordingly, how many people are there in the course at the beginning?

A) 77 B) 84 C) 94 D) 98 E) 100

6. Nahide parasının $\frac{1}{3}$ ünü yemeğe, kalan parasının $\frac{1}{4}$ ünü sinemaya harcamıştır.

Buna göre, geriye 30 lirası kaldığına göre başlangıçta Nahide'nin kaç TL si vardır?

Nahide spends $\frac{1}{3}$ of her money on food, $\frac{1}{4}$ of remainder on cinema.

Accordingly, if Nahide has 30 TL left, how much money does she have at the beginning?

A) 60 B) 55 C) 50 D) 45 E) 40

7. Bir adam 7000 TL olan maaşının $\frac{1}{7}$ sini ev kirasına, kalanın $\frac{9}{25}$ ini mutfak masrafına ayırmıştır.

Buna göre, adamın elinde kaç TL si kalmıştır?

A man has a salary of 7000 TL. He spends $\frac{1}{7}$ of his salary on house rent, $\frac{9}{25}$ of remainder on kitchen expenses.

Accordingly, how many TL has he left at the end?

A) 3840 B) 3740 C) 3700 D) 3640 E) 3600

8. Bir şirket, yıllık gelirinin $\frac{1}{4}$ ünü hayır kurumlarına, kalanını da 120 çalışanına eşit olarak paylaştıracaktır.

Şirketin hayır kurumuna verdiği para ile bir çalışanına verdiği paranın toplamı 123 bin lira ise şirketin yıllık geliri kaç bin TL dir?

A company separates $\frac{1}{4}$ of its annual income to charity organizations and shares the remainder equally among its 120 employees.

If the sum of the money separated to charity organizations and the money paid to an employee is 123 thousands liras, how many liras is the annual income of this company?

A) 300 B) 360 C) 480 D) 600 E) 640

9. Bir sporcu belli bir parkurun $\frac{1}{5}$ ini yürüyerek, $\frac{2}{7}$ sini bisikletle gitmiştir. 130 metre de koşan bu sporcu parkurun $\frac{6}{7}$ sini katetmiş olmaktadır.

Buna göre, sporcu kaç metre yürümüştür?

An athlete walks $\frac{1}{5}$ of a racecourse, goes by bicycle $\frac{2}{7}$ of the same racecourse. He runs on additional 130 m to finish $\frac{6}{7}$ of this racecourse.

Accordingly, how many meters does the athlete walk?

A) 350 B) 280 C) 210 D) 140 E) 70

10. 600 kümes hayvanın olduğu bir kümesteki tavukların sayısı ördeklerin sayısının $\frac{1}{4}$ ü, tavşanların sayısının $\frac{1}{8}$ i, kazların sayısının $\frac{1}{12}$ sidir.

Buna göre, kümeste kaç tavşan vardır?

There are 600 animals in a coop. The number of chickens is $\frac{1}{4}$ of the number of ducks, $\frac{1}{8}$ of the number of rabbits and $\frac{1}{12}$ of the number of geese.

Accordingly, how many rabbits are there in this coop?

A) 24 B) 96 C) 192 D) 288 E) 320

11. Bir bardak su ile dolu iken 240 gram, $\frac{1}{3}$ ü su ile dolu iken 100 gram gelmektedir.

Buna göre, bardağın yarısı su ile dolu iken ağırlığı kaç gramdır?

A full glass of water weighs 240 grams. When $\frac{1}{3}$ of this glass is full, it weighs 100 grams.

Accordingly, what is the weight of a glass which is half full?

A) 135 B) 125 C) 120 D) 110 E) 105

12. Bir ormancı elindeki fidanların $\frac{2}{7}$ sini günde 14 tane dikerek kalanını da günde 30 tane dikerek 26 günde bitirmiştir.

Buna göre, başlangıçta ormancının elindeki fidan sayısı kaçtır?

A forester planted all seedligns in 26 days. If he planted $\frac{2}{7}$ of these seedlings 14 each day and the remaining seedlings 30 each day.

Accordingly, how many seedlings does the forester have at the beginning?

A) 284 B) 336 C) 420 D) 516 E) 588

13. Bir deponun $\frac{5}{12}$ si su ile doludur. Depodaki suyun 500 litresi kullanıldığında deponun $\frac{2}{3}$ ü boş kalmaktadır.

Buna göre, deponun tamamı kaç ton su almaktadır?

$\frac{5}{12}$ of a tank is full of water. When 500 liters of water in this tank is used, $\frac{2}{3}$ of the tank becomes empty.

Accordingly, how many tons of water can this tank hold?

A) 2 B) 3 C) 4 D) 5 E) 6

1-A 2-D 3-E 4-B 5-D 6-A 7-A 8-C 9-E 10-C 11-A 12-E 13-E

1. **Yaşları farkı 3, toplamı 17 olan iki kardeşten büyük olanın yaşı kaçtır?**

The difference of ages of two siblings is 3 but the sum of their ages is 17. How old is the older sibling?

A) 7 B) 8 C) 9 D) 10 E) 11

2. **İki kardeşin bugünkü yaşları toplamı 18 ise 3 yıl sonraki yaş toplamları kaç olur?**

If the sum of ages of two siblings is 18 today, what will this sum be 3 years later?

A) 21 B) 23 C) 24 D) 26 E) 28

3. Ali 3 yıl önce, Ayşe de 5 yıl sonra doğmuş olsaydı yaşları eşit olacaktı.

Ali ve Ayşe'nin bugünkü yaş toplamı 22 olduğuna göre, Ayşe'nin bugünkü yaşı kaçtır?

If Ali was born 3 years earlier and Ayşe was born 5 years later, their ages would be equal.

If the sum of their current ages is 22, how old is Ayşe today?

A) 7 B) 9 C) 11 D) 13 E) 15

4. Nalan bugün 6, Mehmet ise 16 yaşındadır.

Kaç yıl sonra Mehmet'in yaşı, Nalan'ın yaşının iki katına eşit olur?

Nalan is 6 years old and Mehmet is 16 years old today.

How many years later will Mehmet's age be double of Nalan's age?

A) 4 B) 6 C) 8 D) 12 E) 14

5. Yaş farkı 13 olan iki kardeşten küçük olanın yaşı 19 dur.

Buna göre, kaç yıl sonra küçük kardeşin yaşının 4 katı büyük kardeşin yaşının 3 katına eşit olur?

The difference of ages of two siblings is 13. The younger sibling is 19 years old today.

Accordingly, how many years later 4 times the age of younger sibling will be equal to 3 times the age of elder sibling?

A) 7 B) 10 C) 20 D) 23 E) 27

6. Yaş farkı 5 olan iki kardeşin yaşları toplamı farkının 5 katıdır.

Buna göre, büyük kardeşin bugünkü yaşı kaçtır?

If the difference of ages of two siblings is 5 and the sum of their ages is 5 times this difference, how old is the older sibling?

A) 10 B) 15 C) 20 D) 25 E) 30

7. Yaşları oranı $\frac{2}{3}$ olan iki kardeşin 4 yıl sonraki yaşları oranı $\frac{6}{7}$ dir.

Buna göre, bu iki kardeşin bugünkü yaşları toplamı kaçtır?

The ratio of ages of two siblings is $\frac{2}{3}$ today, but this ratio becomes $\frac{6}{7}$ four years later.

Accordingly, what is the sum of their current ages?

A) 5 B) 10 C) 15 D) 18 E) 20

8. Yaşları toplamı 83 olan 4 arkadaşın 5 yıl önceki yaş toplamı x, 3 yıl sonraki yaş toplamı y dir.

Buna göre, (x + y) kaçtır?

If the sum of ages of 4 friends is 83 today but this sum five years ago is x and three years later is y.

Accordingly, what is the value of x + y?

A) 95 B) 150 C) 158 D) 165 E) 173

9. Zeynep'in yaşı, Nalan'ın yaşının 5 katıdır.

3 yıl sonra Zeynep'in yaşı, Nalan'ın yaşının 4 katı olduğuna göre, Nalan bugün kaç yaşındadır?
Zeynep's age is 5 times Nalan's age.

If Zeynep's age is 4 times Nalan's age 3 years later, how old is Nalan today?

A) 9 B) 18 C) 27 D) 36 E) 45

10. 4 er yıl ara ile doğan 3 kardeşten büyük olan kardeş, en küçük kardeşin yaşındayken en küçük kardeşin doğmasına 2 yıl vardır.

Buna göre, ortanca kardeşin şimdiki yaşı kaçtır?
3 siblings were born 4 years apart. When oldest sibling was at the same age as youngest one, youngest sibling had 2 years to be born.

Accordingly, how old is the middle sibling now?

A) 6 B) 10 C) 14 D) 18 E) 22

11. Yaşları toplamı 100 olan iki kardeşten büyük olan küçük olanın yaşındayken küçük kardeş 23 yaşındaydı.

Buna göre, büyük olan kardeş bugün kaç yaşındadır?
The sum of ages of two siblings is 100. When elder sibling was at the same age as younger sibling the younger one was 23 years old.

Accordingly, how old is the elder sibling now?

A) 57 B) 58 C) 59 D) 60 E) 61

12. Bir annenin yaşı kızının yaşının 8 katıdır.

Kız annenin bugünkü yaşının yarısına geldiğinde ikisinin yaşları toplamı 90 olduğuna göre, kızı dünyaya geldiğinde anne kaç yaşındadır?
The age of mother is 8 times the age of her daughter. When the daughter is at the same age as half of mother's current age, the sum of their ages will be 90.

How old was the mother when her daughter was born?

A) 36 B) 38 C) 40 D) 42 E) 50

13. Ayla, Banu ve Ceyda'nın yaşları toplamı 63'tür. Ayla Banu'nun yaşındayken Ceyda da 31 yaşındaydı.

Buna göre, Ayla bugün kaç yaşındadır?
The sum of ages of Ayla, Banu and Ceyda is 63. When Ayla was at the same age as Banu, Ceyda was 31 years old.

Accordingly, how old is Ayla today?

A) 16 B) 18 C) 21 D) 23 E) 25

14. Nagehan'la Reyhan'ın yaşları toplamı 73 dür. Reyhan, Nagehan'ın yaşına geldiğinde Nagehan 50 yaşında olacaktır.

Buna göre, Reyhan bugün kaç yaşındadır?
The sum of ages of Nagehan and Reyhan is 73. When Reyhan is at the same age as Nagehan, Nagehan will be 50 years old.

Accordingly, how old is Reyhan today?

A) 36 B) 35 C) 34 D) 33 E) 32

15. Ahmet, Mehmet'in yaşındayken Mehmet 24 yaşındadır. Mehmet Ahmet'in yaşına geldiğinde de Ahmet 42 yaşında olacaktır.

Buna göre, Ahmet ve Mehmet'in bugünkü yaşı toplamı kaçtır?
When Ahmet was at the same age as Mehmet, Mehmet was 24 years old. When Mehmet is at the same age as Ahmet, Ahmet will be 42 years old.

Accordingly, what is the sum of their ages today?

A) 59 B) 64 C) 66 D) 67 E) 68

16. Belli bir grubun 3 yıl sonraki yaş toplamı 162, 5 yıl önceki yaş toplamı ise 82 dir. Bu yıllar arasında kişi sayısı değişmemiştir.

Buna göre, bu toplulukta kaç kişi vardır?
The sum of ages of a group of people after 3 years is 162, before 5 years it was 82.

Accordingly, how many people are there in this group?

A) 6 B) 7 C) 8 D) 9 E) 10

1-D 2-C 3-E 4-A 5-C 6-B 7-A 8-C 9-A 10-B 11-C 12-D 13-A 14-E 15-C 16-E

1. 2000 yılında 3 yaşında olan Nilay 2018 yılında kaç yaşında olur?

Nilay is 3 years old in 2000. How old is she in 2018?

A) 18 B) 21 C) 22 D) 23 E) 24

2. 2000 yılında x yaşında olan Kader'in 2031 yılındaki yaşı, 2000 yılındaki yaşının 1 fazlasının karesidir.

Buna göre, Kader 2000 yılında kaç yaşındadır?

Kader is x years old in 2000. Kader's age in 2031 is the square of one more her age in 2000.

Accordingly, how old is Kader in 2000?

A) 5 B) 6 C) 7 D) 8 E) 9

3. 2010 yılındaki yaşının 2018 yılındaki yaşına oranı $\frac{2}{3}$ olan hangi yılda doğmuştur?

If the ratio of his age in 2010 to his age in 2018 is $\frac{2}{3}$, when was he born?

A) 1994 B) 1995 C) 1996 D) 1997 E) 1998

4. Bir apartmandaki insanların yaşları toplamı 255 tir. 4 yıl önce apartmandaki kişi sayısı aynıdır ve apartmanda yaşayan insanların yaş ortalaması 11 dir.

Buna göre, apartmanda yaşayan insan sayısı kaçtır?

The sum of ages of people who live in the same apartment is 255. The mean of ages of these people 4 years ago was 11.

Accordingly, how many people are there in this apartment?

A) 13 B) 14 C) 15 D) 16 E) 17

5. 3 er yıl arayla doğmuş 3 kardeşin 2008 yılındaki yaşları toplamı 69 ise büyük kardeş hangi yılda dünyaya gelmiştir?

3 siblings were born 3 years apart. If the sum of their ages in 2008 was 69, when was elder sibling born?

A) 1980 B) 1981 C) 1982 D) 1983 E) 1984

6. Bir dernekteki 15 kişinin yaş ortalaması 3 yıl önce 18 ise 3 yıl sonra kaçtır?

The average age of 15 people in an association before three years was 18. What will this average be 3 years later?

A) 21 B) 24 C) 26 D) 27 E) 30

7. 3 er yıl arayla doğmuş 4 kardeşin yaşları toplamı annelerinin yaşına eşittir.

7 yıl sonra anne 61 yaşında olacağına göre en küçük çocuk doğduğunda anne kaç yaşındadır?

4 siblings were born 3 years apart and the sum of their ages is equal to their mother's age.

If 7 years later the mother will be 61 years old, how old was the mother when the youngest child was born?

A) 36 B) 39 C) 41 D) 45 E) 47

8. 2003 yılında Adil'in yaşı Meral'in yaşının 2 katının 3 eksiğidir. 2018 yılında Adil ve Meral'in yaşlarının toplamı 2003 yılındaki yaş toplamlarının 2 katıdır.

Buna göre, 2000 yılında Adil kaç yaşındadır?

In 2003, Adil's age was 3 less than 2 times Meral's age.

In 2018, the sum of their ages is twice the sum of their ages in 2003.

Accordingly, how old was Adil in 2000?

A) 18 B) 17 C) 16 D) 15 E) 14

9. Savaş ve Barış'ın bugünkü yaşları toplamı 83 tür. Savaş, Barış'ın bugünkü yaşına geldiğinde her ikisinin yaşları toplamı 101 olacaktır.

Buna göre, Barış'ın yaşı kaçtır?
The sum of ages of Savaş and Barış is 83 today. When Savaş is at the same age as Barış, the sum of their ages will be 101.

Accordingly, how old is Barış now?

A) 37 B) 38 C) 40 D) 46 E) 48

10. Bugünkü yaşları 12 ve 17 ile orantılı olan iki meslektaşın 6 yıl sonra yaşları 3 ve 4 ile orantılı olacaktır.

Buna göre, bu iki meslektaşın bugünkü yaş farkı kaçtır?
The current ages of two colleagues are proportional to 12 and 17. 6 years later, their ages will be proportional to 3 and 4.

Accordingly, what is the difference of the ages of the colleagues today?

A) 5 B) 10 C) 15 D) 20 E) 25

11. 12 ve 13 yaşlarından oluşan 38 kişilik bir izci grubundaki çocukların yaşları toplamı 474 tür.

Buna göre, bu izci grubunda 13 yaşında kaç çocuk vardır?
A scout group consists of 38 children some of which are 12 others are 13 years old. The sum of their ages is 474.

Accordingly, how many 13 years old children are there in this group?

A) 18 B) 20 C) 22 D) 24 E) 25

12. Bir annenin yaşı kızının yaşının 3 katı ve eşinin yaşının 3 eksiğidir.

Anne, baba ve kızın yaşları toplamı 101 olduğuna göre, anne bugün kaç yaşındadır?
The age of a mother is 3 less than her hunband's age but her age is 3 times the age of her daughter.

Today the sum of their ages is 101. How old is the mother now?

A) 40 B) 41 C) 42 D) 44 E) 45

13. Atike 31 yaşında, Hansa (a + 2) yaşındadır.

Hansa (2a + 3) yaşına geldiğinde, Atike kaç yaşında olur?
Atike is 31 years old and Hansa is (a + 2) years old today.

How old will Atike be when Hansa reaches the age of (2a + 3)?

A) 31 + 3a B) 32 + 2a C) 31 + 2a D) 31 + a E) 32 + a

14. 12 yaşındaki izcilerin sayısının 2 katı, 22 yaşındaki izcilerin sayısının 3 katına eşittir.

Buna göre, tüm izcilerin ortalama yaşı kaçtır?
2 times the number of 12 years old scouts is equal to 3 times the number of 22 years old scouts.

Accordingly, what is the average age of all scouts?

A) 16 B) 17 C) 18 D) 19 E) 20

15. 1974 yılında doğan bir matematikçi yaşı için şunları söylemiştir. "Bugünkü yaşım doğum yılımın rakamlarının toplamının 2 katından 3 fazladır."

Buna göre, matematikçinin bugünkü yaşı kaçtır?
A mathematician was born in 1974. He said that his current age is 3 more than 2 times the sum of digits of his birth year.

Accordingly, how old is he now?

A) 44 B) 45 C) 46 D) 47 E) 48

16. Bir bahçedeki x, y, z cins ağaçlarının yaş ortalaması 32, 35 ve 37 cm dir. x ve y cins ağaçların yaş ortalaması 33, y ve z cins ağaçların yaş ortalaması 36 dır.

Buna göre, bahçedeki tüm cins ağaçların yaş ortalaması kaçtır?
In a garden, there are 3 types of trees x, y and z. The average ages of trees of type x, y and z are respectively 32, 35 and 37. The average age of trees of type x and type y is 33 while the average age of trees of type y and type z is 36.

Accordingly, what is the average age of all types of trees?

A) 34 B) 36 C) 38 D) 39 E) 40

1-B 2-A 3-A 4-E 5-C 6-B 7-D 8-C 9-D 10-B 11-A 12-C 13-E 14-A 15-B 16-A

1. **Saatte 40 km hızla giden bir araç 440 km lik yolu kaç saatte alır?**

How many hours does it take for a car with the velocity of 40 km/h to travel a 440 km long road?

A) 9 B) 10 C) 11 D) 12 E) 13

2. İzmir'den Bursa'ya v km/sa hızla hareket eden bir araç yolu 5 saatte tamamlamıştır. Dönüşte hızını 20 km/sa azaltan araç yolu 7 saatte tamamlamıştır.

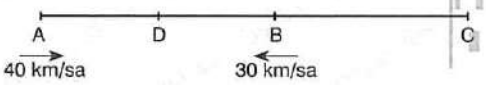
Buna göre, araç İzmir'den Bursa'ya kaç km/sa hızla gitmiştir?

A vehicle travels from İzmir to Bursa in 5 hours with the velocity of v km/h. It returns the same road in 7 hours since the vehicle decreases its velocity by 20 km/h.

Accordingly, how many km/h is the velocity of this vehicle during the trip from İzmir to Bursa?

A) 70 B) 68 C) 66 D) 65 E) 64

3.



A ve B noktalarında bulunan ve hızları 40 km/sa ve 30 km/sa olan iki araç birbirlerine doğru hareket ederlerse 7 saat sonra D noktasında karşılaşmaktadırlar. Her iki araç C'ye doğru hareket ederse 60 saat sonra A'daki araç C'de diğer araca yetişebilmektedir.

Buna göre, $|DC| = ?$

Two cars at points A and B take off at the same time towards each other with the velocities 40 km/h and 30 km/h respectively. These cars meet at point D in 7 hours after they move. If both cars begin to travel towards to point C, the car at point A will catch up with the other car at point C after 60 hours.

Accordingly, what is the distance $|DC|$?

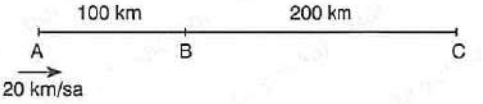
A) 2000 B) 2010 C) 2020 D) 2030 E) 2040

4. **250 metrelik bir yolu saatteki hızı 50 km olan bir araç kaç dakikada alır?**

How many minutes does it take for a car travelling with the speed of 50 km/h to cover the distance of 250 m?

A) 5 B) 4 C) 3 D) $\frac{1}{2}$ E) $\frac{3}{10}$

5.



A'dan B'ye 20 km/sa hızla hareket eden bir araç B'ye gelince hızını iki katına çıkarıp yolu tamamlamıştır.

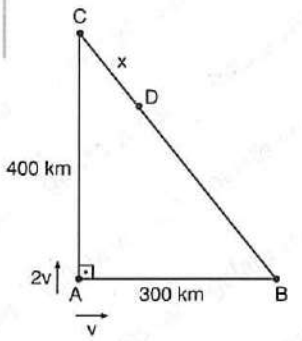
Buna göre, $|AC|$ yolunun tamamı kaç saatte tamamlanmış olur?

A car travels from city A to city B with the velocity of 20 km/h. When it reaches the city B, the car doubles its velocity to complete this trip.

Accordingly, how many hours does it take for this car to cover the distance $|AC|$?

A) 7 B) 8 C) 9 D) 10 E) 12

6.



$|AB| = 300$ km

$|AC| = 400$ km

A noktasında olan ve hızları v km/sa ve 2v km/sa olan iki araç aynı anda zıt yönde hareket ederek D noktasında karşılaşmışlardır.

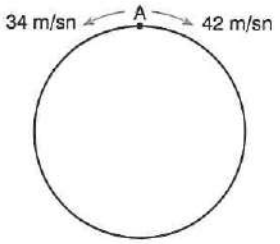
Buna göre, $|BD|$ yolu kaç km'dir?

Two vehicles take off at the same time from point A in opposite directions and they meet at point D.

If the velocities of these vehicles are v km/h and 2v km/h, what is the distance $|BD|$?

A) 400 B) 300 C) 200 D) 100 E) 50

7.



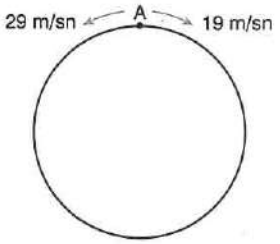
Çevresi 608 metre olan bir pistin A noktasında bulunan iki aracın hızları 34 m/sn ve 42 m/sn dir.

Buna göre, bu iki araç aynı anda aynı noktadan birbirlerine doğru hareket ettiklerinden kaç saniye sonra karşılaşırlar?

The circumference of a circular track is 608 m. Two vehicles take off from the point A with the velocities of 34 m/s and 42 m/s at the same time in opposite directions. Accordingly, how many minutes does it take for these vehicles to meet for the first time?

A) 7 B) 8 C) 9 D) 10 E) 11

8.



Dairesel bir pistin A noktasında hızları 19 m/sn ve 29 m/sn olan iki araç bulunmaktadır. Bu iki araç birbirlerine doğru hareket ederlerse ilk kez 5 saniye sonra karşılaşmaktadır.

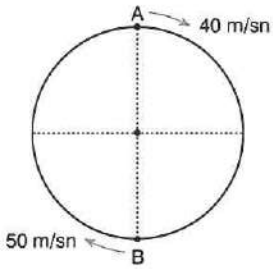
Buna göre, A noktasından aynı yöne doğru hareket ederlerse hızlı olan yavaş olan aracı ilk kez kaçıncı saniyede yakalar?

There are two cars at the point A with the velocities of 19 m/s and 29 m/s. If they take off at the same time from the point A in opposite directions, they will meet for the first time 5 seconds later.

Accordingly, after how many seconds will the faster car catch up with other one if they start to move from the point A in the same direction?

A) 22 B) 24 C) 25 D) 27 E) 29

9.



A ve B noktalarında bulunan iki aracın hızları sırayla 40 m/sn ve 50 m/sn'dir. Pistin çevresi 200 metredir.

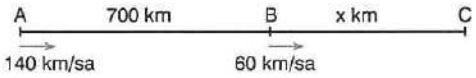
Aynı anda aynı yöne doğru hareket eden araçlar ilk kez kaç saniye sonra karşılaşırlar?

There are two cars at the points A and B respectively with the velocities 40 m/s and 50 m/s. The circumference of the track is 200 m.

If the cars take off at the same time in the same direction, after how many seconds will they meet for the first time?

A) 10 B) 15 C) 20 D) 25 E) 30

10.



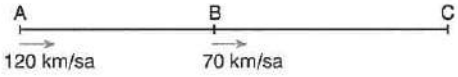
$|AB| = 700$ km, $|BC| = x$ km

$|AB|$ yolunu saatte 140 km, $|BC|$ yolunu 60 km hızla alan bir araç tüm yolu 10 saatte aldığına göre, x kaç km dir?

If a car travels the distane $|AB|$ with the velocity of 140 km/h and the distance $|BC|$ with the velocity of 60 km/h, it takes 10 hours to cover all the distance. Accordingly, how many km is x?

A) 180 B) 240 C) 300 D) 360 E) 420

11.



A noktasında bulunan ve hızı 120 km/sa olan bir araç, B noktasında bulunan ve hızı saatte 70 km/sa olan başka bir araca 5 saat sonra C noktasında ulaşmıştır.

Buna göre, $|AB|$ arası kaç km'dir?

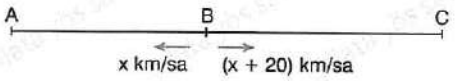
A car at the point A with the velocity of 120 km/h catches up with another car at the point B with the velocity of 70 km/h after 5 hours at the point C.

Accordingly, how many km is the distance $|AB|$?

A) 600 B) 350 C) 300 D) 250 E) 200

1-C 2-A 3-B 4-E 5-D 6-D 7-B 8-B 9-A 10-C 11-D

1.



B noktasında olan ve hızları x km/sa ve (x + 20) km/sa olan iki araç birbirlernie zıt yönde hareket ettikten 10 saat sonra aralarındaki mesafe 720 km olmaktadır.

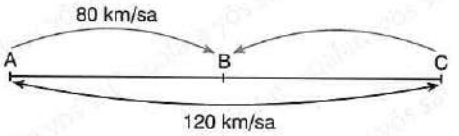
Buna göre, hızlı olan aracın saatteki hızı kaç km dir?

The distance between two vehicles with the velocities of x km/h and (x + 20) km/h becomes 720 km after 10 hours they start to move from the point B in opposite directions.

Accordingly, how many km/h is the velocity of the faster vehicle?

A) 20 B) 26 C) 36 D) 40 E) 46

2.



A noktasındaki iki araçtan hızı 80 km/sa olan araç B noktasına vardığı anda hızı 120 km/sa olan araç da C noktasına uğrayıp B noktasına varmıştır.

Buna göre, $\frac{|AB|}{|BC|} = ?$

Two cars take off from the point A at the same time in the same direction. When the car with the velocity of 80 km/h reaches the point B, the car with the velocity of 120 km/h also reaches the point B returning from the point C.

Accordingly, what is the value of $\frac{|AB|}{|BC|} = ?$

A) 4 B) 3 C) 2 D) $\frac{3}{2}$ E) $\frac{1}{2}$

3. Saatteki hızı 60 km olan bir trenin bir çizgiyi geçme süresi 15 saniyedir.

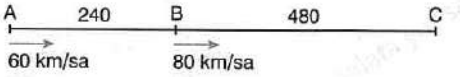
Buna göre, bu tren kendi boyunun 2 katı uzunluğundaki bir tüneli kaç saniyede geçer?

A train with the velocity of 60 km/h passes a line in 15 seconds.

Accordingly, how many seconds does it take for this train to pass a tunnel whose length is twice its length?

A) 45 B) 48 C) 54 D) 57 E) 60

4.



A noktasından 60 km/sa hızla yola çıkan bir araç, B noktasında hızını 80 km/sa hıza çıkarmış ve bu şekilde C noktasına ulaşmıştır.

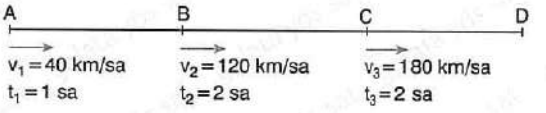
Buna göre, |AC| yolu boyunca aracın ortalama hızı kaç km/sa tir?

A car travels from point A with a velocity of 60 km/h. The car increases its velocity to 80 km/h at point B and this way it reaches point C.

What is the average velocity of this car along the distance |AC|?

A) 77 B) 72 C) 70 D) 69 E) 68

5.



A noktasından yola çıkan bir araç 1 saat boyunca saatte 40 km hızla B noktasına gelmiş, B noktasından C noktasına kadar 2 saat boyunca 120 km hızla ilerlemiş, C noktasından D noktasına kadar da 2 saat boyunca 180 km hızla varmıştır.

Buna göre, bu aracın yol boyunca ortalama hızı kaç km/sa tir?

A vehicle travels from point A to B with a velocity of 40 km/h in 1 hour. Then it travels from point B to C with a velocity of 120 km/h in 2 hours. This car takes off point C with a velocity of 180 km/h and after 2 hours it reaches point D. Accordingly, how many km/h is the average velocity of the car during whole trip?

A) 120 B) 124 C) 128 D) 132 E) 140

6. Saatteki hızı 120 km olan bir tren 100 metre uzunluğundaki bir tüneli geçme süresi 12 saniyedir.

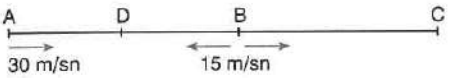
Buna göre, trenin boyu kaç metredir?

A train with the velocity of 120 km/h passes a tunnel with the length of 100 m in 12 seconds.

Accordingly, how many meters is the length of this train?

A) 400 B) 300 C) 350 D) 200 E) 150

7.



A ve B noktalarında bulunan iki araç birbirlerine doğru hareket ederlerse t_1 saatte D noktasında, aynı yöne doğru hareket ederlerse de t_2 saatte C noktasında bir araya gelmektedirler.

Buna göre, $\frac{t_2}{t_1} = ?$

If two vehicles at the points A and B start to move towards each other, they meet at the point D after t_1 hours. If they start to move in the same direction, they meet at the point C after t_2 hours.

Accordingly, what is the value of $\frac{t_2}{t_1}$?

A) 4 B) 3 C) 2 D) $\frac{3}{2}$ E) 1

8.

A noktasında bulunan bir araç her iki saatte bir sırayla B ve C noktalarında mola vererek D noktasına ulaşmıştır. A noktasından 40 km/sa hızla yola çıkan araç herbir moladan sonra hızını 10 km/sa arttırmıştır.

Buna göre, bu aracın yol boyunca ortalama hızı kaç km/sa tir?

A car travels from point A to point D. During this trip, it takes a break in each 2 hours respectively in point B and point C. If the car starts to move from point A with a velocity of 40 km/h and its velocity is increased by 10 km/h after each break.

Accordingly, what is the average velocity of the car during this trip?

A) 42 B) 48 C) 50 D) 54 E) 56

9. 240 metrelik bir mesafeyi akıntıyla aynı yönde yüzdüğünde 5 dakikada alan bir yüzücü, akıntıyla ters yönde hareket ettiğinde aynı mesafeyi 10 dakikada yüzmektedir.

Buna göre, yüzücünün hızı durgun suda kaç m/dk dır?

A swimmer covers the distance of 240 m in 5 minutes if he swims in the same direction of the current. The swimmer covers the same distance in 10 minutes if he swims against the current.

Accordingly, what is the velocity m/min of swimmer in still water?

A) 12 B) 18 C) 36 D) 40 E) 44

10. Bir bisiklet sürücüsü gideceği yolun $\frac{1}{6}$ sını 40 km/sa, $\frac{1}{3}$ ünü 60 km/sa ve $\frac{1}{2}$ sini 80 km/sa hızla almıştır.

Yolun tamamını 46 saatte tamamlayan sürücünün 40 km/sa hızla gitmiş olduğu yol kaç kilometredir?

A bicyclist travels $\frac{1}{6}$ of the distance with the velocity of 40 km/h, $\frac{1}{3}$ with the velocity of 60 km/h and $\frac{1}{2}$ with the velocity of 80 km/h.

If the bicyclist travels all distance in 46 hours, how many km is the distance which he travels with the velocity of 40 km/h?

A) 320 B) 360 C) 400 D) 440 E) 480

11. Bir araç x km lik bir yolu v km/sa hızla t saatte almıştır. Aynı yolu hızı 60 km/sa azalttığında (t + 2) saatte alan bu araç hızını saatte 80 km arttırırsa (t – 2) saatte almaktadır.

Buna göre, yol kaç km dir?

A car travels the distance of x km with a velocity of v km/h in t hours. If the car decreases its velocity by 60 km/h, it covers the same distance in (t + 2) hours. If this car increases its velocity by 80 km/h, it cover the same distance in (t – 2) hours.

Accordingly, how many km is this distance?

A) 6650 B) 6670 C) 6700 D) 6720 E) 6800

12. A noktasından yola çıkan bir araç B noktasına saat 18.00 de ulaşabilmek için 80 km/sa hızla hareket etmektedir. Bu araç 50 km/sa hızla hareket ederse B noktasına saat 21.00 da ulaşmaktadır.

Buna göre, bu aracın B noktasına saat 18.00 de ulaşabilmesi için saat kaçta yola çıkması gerekmektedir?

A vehicle should take off with the velocity of 80 km/h from point A in order to reach point B at 18.00. If this vehicle takes off with the velocity of 50 km/h from point A, it will reach point B at 21.00.

Accordingly, at what o'clock should the vehichle take off from point A in order to reach point B at 18.00?

A) 13.00 B) 13.30 C) 14.00 D) 14.30 E) 15.00

1-E 2-A 3-A 4-B 5-C 6-B 7-B 8-C 9-C 10-E 11-D 12-A

1. Atike bir işi 9 günde, Halil ise 18 günde yapabilmektedir.

Buna göre, Atike ve Halli aynı işi kaç günde birlikte yapabilirler?

Atike finishes a work in 9 days but Halil finishes it in 18 days.

Accordingly, how many days does it take for them to finish this work together?

A) 6 B) 12 C) 18 D) 21 E) 27

2. Nisanur bir işi 3 dakikada, Kaan ise aynı işi 6 dakikada yapabilmektedir.

Buna göre, Nisanur ve Kaan birlikte aynı işi yaptıklarında 1 dakikada işin kaçta kaçı biter?

Nisanur completes a job in 3 minutes but Kaan completes it in 6 minutes.

Accordingly, what ratio of this job is done if they work together for 1 minute?

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

3. Bir usta bir işin $\frac{1}{3}$ ünü 4 saatte, kalfa ise aynı işin $\frac{1}{4}$ ünü 9 saatte yapabilmektedir.

Buna göre, usta ve kalfa aynı işi kaç saatte bitirebilirler?

A master completes $\frac{1}{3}$ of a work in 4 hours while an apprentice completes only $\frac{1}{4}$ of it in 9 hours.

Accordingly, how many hours does it take for them to complete this work together?

A) 4 B) 6 C) 8 D) 9 E) 12

4. İki kardeş bir işi tek başlarına sırayla 15 ve 30 saatte bitirebilmektedirler.

Buna göre, ikisi birlikte işin $\frac{1}{5}$ ini kaç saatte bitirebilirler?

Two siblings complete the same work separately in 15 and 30 hours.

Accordingly, how many hours do they need to complete $\frac{1}{5}$ of this work together?

A) 1 B) 2 C) 3 D) 4 E) 5

5. Aynı işi tek başlarına iki kardeşten biri diğerine göre 8 gün daha geç bitirebilmektedir.

İkisi birlikte aynı işi 3 günde bitirdiklerine göre yavaş olan tek başına aynı işi kaç günde bitirebilir?

One of two siblings completes a work 8 days later than the other.

If they complete the work together in 3 days, how many days does it take for the slower sibling to complete this work alone?

A) 4 B) 8 C) 12 D) 14 E) 15

6. Meryem bir işi 6 günde, Ayten ise 10 günde tek başlarına yapabilmektedir. İkisi birlikte 2 gün aynı işte çalıştıktan sonra Ayten işi bırakmış Meryem tek başına çalışarak işi tamamlamıştır.

Buna göre, Meryem tek başına kaç gün çalışmıştır?

Meryem and Ayten complete a job separately in respectively 6 days and 10 days. They begin to work together but after 2 days Ayten stops working and Meryem works alone to complete the job.

Accordingly, how many days does Meryem work alone?

A) 4 B) $\frac{17}{5}$ C) $\frac{16}{5}$ D) 3 E) $\frac{14}{5}$

7. Emir ve Mustafa birlikte 10 gün çalışarak bir işin $\frac{25}{36}$ sını bitirmiştir.

Mustafa kalan işi tek başına 11 gün çalışarak tamamladığına göre Emir bu işi tek başına kaç günde bitirebilir?

Emir and Mustafa work together for 10 days to complete $\frac{25}{36}$ of a work.

If Mustafa finishes the remaining part of this work alone in 11 days, how many days does it take for Emir to complete the whole work alone?

A) 36 B) 30 C) 24 D) 20 E) 16

8. Adem, Emir'in 2 katı, Mustafa'nın 3 katı hızla çalışmaktadır.

Adem, Emir ve Mustafa birlikte bir işi 18 günde bitirdiklerine göre Adem aynı işi tek başına kaç günde bitirebilir?

Adem works twice as fast as Emir, but 3 times as fast as Mustafa.

If three of them together complete a job in 18 days, how many days are needed for Adem to complete the same job alone?

A) 22 B) 33 C) 44 D) 55 E) 66

9. Hasan bir işi tek başına 36 saatte Faik de aynı işi tek başına 72 saatte bitirebilmektedir.

Hasan kapasitesini iki katına çıkarıp, Faik de yarıya düşürürse ikisi birlikte aynı işi kaç saatte bitirebilirler?

Hasan completes a work in 36 hours but Faik completes it in 72 hours.

If Hasan increases his capacity twice but Faik decreases his capacity by half, how many hours does it take for them to complete the work together?

A) 16 B) 18 C) 20 D) 22 E) 24

10. Her biri eşit kapasiteye sahip 4 işçi bir işi birlikte 9 günde bitirebilmektedir.

Eğer işçiler işe birlikte başlayıp her günün sonunda bir işçi işi bırakırsa kalan en son işçi kalan işi tek başına kaç günde bitirebilir?

4 workers with the same capacity complete a job in 9 days.

If they all start to work together but one worker leaves at the end of each day, how many days are required for the last worker to complete the remaining work alone?

A) 1 B) 7 C) 18 D) 27 E) 36

11. Aynı kapasitedeki 5 işçi birlikte bir işe başlıyorlar. 2 gün sonra bir işçi işten ayrılıyor. Daha sonra her 2 gün sonunda bir işçi daha ayrılıyor ve en son kalan işçi de 2 gün çalışınca iş bitmiş oluyor.

Buna göre, herhangi bir işçinin tek başına işi bitirme süresi kaç gündür?

5 workers with the same capacity begin to work together. One worker leaves at the end of every 2 days. The last one completes the remaining work in 2 days.

Accordingly, how many days does it take for 1 worker to complete whole work alone?

A) 10 B) 15 C) 20 D) 27 E) 30

12. Bir işte Ali 3 gün, Banu 4 gün birlikte çalışırsa işin $\frac{1}{2}$ si bitmektedir. Eğer Ali 2 gün, Banu 1 gün birlikte çalışırsa işin $\frac{1}{3}$ ü bitmektedir.

Ali bu işte tek başına çalışırsa bu işi kaç günde bitirebilir?

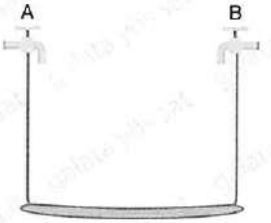
If Ali works 3 days and Banu works 4 days, they complete $\frac{1}{2}$ of a work. If Ali works 2 days and Banu works 1 day, they complete $\frac{1}{3}$ of this work.

How many days does Ali need to complete the work alone?

A) 6 B) 5 C) 4 D) 3 E) 2

1-A 2-E 3-D 4-B 5-C 6-E 7-C 8-B 9-A 10-D 11-E 12-A

1.



Yukarıdaki havuzu boşken A musluğu tek başına 5 saatte, B musluğu ise 20 saatte doldurmaktadır.

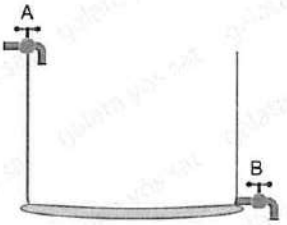
Buna göre, boş havuzu A ve B muslukları birlikte kaç saatte doldurabilirler?

Faucet A fills an empty pool in 5 hours but faucet B fills it in 20 hours.

Accordingly, how many hours does it take for these faucets to fill the pool together?

A) 3 B) 4 C) 5 D) 6 E) 7

2.



Boş bir havuzu A musluğu tek başına 3 saatte doldurmakta, havuzun dibinde bulunan B musluğu da dolu havuzu tek başına 4 saatte boşaltmaktadır.

Buna göre, havuz boşken A ve B muslukları açıldığında havuz kaç saatte dolar?

Faucet A fills an empty pool in 3 hours but faucet B at the bottom of the pool empties a full pool in 4 hours.

Accordingly, how many hours does it take to fill the empty pool if both faucets are opened together?

A) 12 B) 10 C) 7 D) 6 E) 5

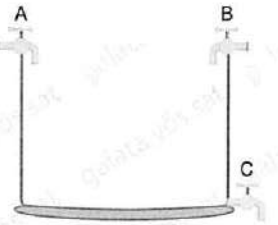
3. Her biri diğerinin 2 katı daha hızlı akan 3 musluk boş bir havuzu birlikte 16 saatte doldurabilmektedir.

Buna göre, kapasitesi en yüksek olan musluk havuzu tek başına kaç saatte doldurabilir?

Each of 3 faucets is twice as fast as the other. If these 3 faucets fill an empty pool together in 16 hours, how many hours does the faucet with the highest capacity need to fill this pool alone?

A) 56 B) 28 C) 14 D) 7 E) 4

4.



Boş bir havuzu tek başına 2 saatte dolduran bir A musluğu ve 3 saatte tek başına dolduran bir B musluğu vardır. Aynı havuzun dibinde de dolu havuzu tek başına 6 saatte boşaltan bir C musluğu vardır.

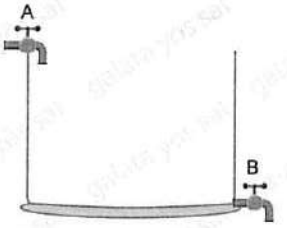
Buna göre, havuz boşken aynı anda açılan A, B ve C muslukları havuzun tamamını kaç dakikada doldurabilir?

Faucet A and faucet B fill an empty pool separately in 2 and 3 hours respectively. Faucet C empties a full pool in 6 hours.

Accordingly, how many minutes does it take for the three faucets to fill this pool together?

A) $\frac{2}{3}$ B) 10 C) 20 D) 30 E) 90

5.



Boş bir havuzun yarısını a saatte dolduran bir A musluğu ile dolu havuzu tek başına 3a saatte boşaltan bir B musluğu bulunmaktadır.

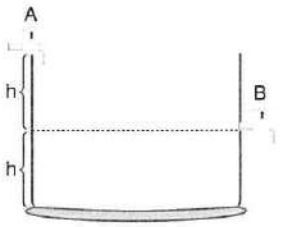
Havuz boşken birlikte açılan A ve B muslukları havuzu 18 saatte doldurduklarına göre B musluğu tek başına dolu havuzu kaç saatte boşaltabilir?

Faucet A fills a half of empty pool in a hours but faucet B empties a full pool in 3a hours.

If both faucets fill this pool together in 18 hours, how many hours does it take for faucet B to empty the full pool?

A) 3 B) 6 C) 9 D) 12 E) 15

6.



A musluğu boş bir havuzu 3 saatte doldurmakta, B musluğu ise dolu havuzu kendi seviyesine kadar 6 saatte boşaltabilmektedir.

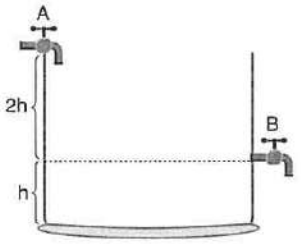
Buna göre, A ve B muslukları bu havuzu kaç saatte doldurabilir?

Faucet A fills an empty pool in 3 hours but faucet B empties the part of the full pool to its level in 6 hours.

Accordingly how many hours are necessary for both faucets to fill this pool together?

A) 2 B) 3 C) $\frac{7}{2}$ D) 4 E) $\frac{9}{2}$

7.



A musluğu boş bir havuzun tamamını 6 saatte doldurmakta, B musluğu ise aynı havuzun tamamını 9 saatte boşaltmaktadır.

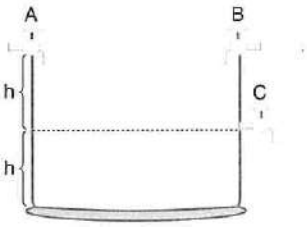
Buna göre, B musluğu havuzun yerden yüksekliğinin $\frac{1}{3}$ ü kadar bir yüksekliğe konursa A musluğu ile birlikte havuzu kaç saatte doldurabilirler?

Faucet A fills an empty pool in 6 hours but faucet B empties a full pool in 9 hours.

Faucet B is located in the height which is $\frac{1}{3}$ of the height of the pool from the ground. Accordingly, how many hours does it take for both faucets to fill the pool together?

A) 12 B) 14 C) 16 D) 17 E) 18

8.



Boş bir havuzu A musluğu tek başına 10 saatte, B musluğu ise 4 saatte doldurabilmektedir. Havuzun yarı yüksekliğinde bulunan bir C musluğununda havuzun tamamını boşaltma süresi 8 saattir.

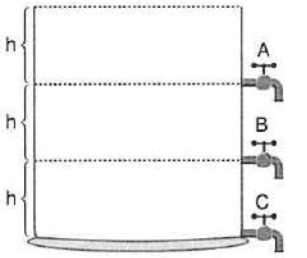
Buna göre, bu üç musluk havuz boşken açıldığında havuz kaç saatte dolar?

Faucet A fills an empty pool in 10 hours and faucet B fills it in 4 hours. Faucet C which is located at the halfway empties a full pool in 8 hours.

Accordingly how many hours does it take for three faucets to fill this pool together?

A) $\frac{115}{32}$ B) $\frac{230}{63}$ C) $\frac{229}{63}$ D) $\frac{220}{63}$ E) $\frac{219}{63}$

9.



Özdeş olan A, B ve C muslukları bulundukları noktalarda olmak koşulu ile dolu havuzu boşaltmaktadırlar.

Her birinin tek başına boşaltma kapasitesi 36 saat olduğuna göre, verilen koşullarda havuz kaç saatte boşalır?

Three identical faucets A, B, C are located as shown in the figure. Each faucet can empty a full pool in 36 hours alone.

Accordingly how many hours are necessary to empty the full pool if all 3 faucets are opened together?

A) $\frac{25}{3}$ B) $\frac{41}{5}$ C) $\frac{131}{3}$ D) $\frac{126}{5}$ E) 22

1-B 2-A 3-B 4-E 5-C 6-C 7-B 8-B 9-E

1. Biri boş bir havuzu 10 saatte dolduran, diğeri de 12 saatte boşaltan iki musluk 6 saat birlikte aktıktan sonra havuzu boşaltan musluk kapatılıyor.

Buna göre, havuzun kalan kısmı kaç saatte dolar?

One of two faucets fills a pool in 10 hours and another empties it in 12 hours. 6 hours after both faucets are opened, the faucet which empties the pool is closed.

Accordingly, how many hours does it take to fill the remaining part of this pool?

A) 9 B) 10 C) 11 D) 12 E) 13

2. Bir işi Arda ve Esat birlikte 5 günde bitirebilmektedir. Eğer Arda 2 gün, Esat 3 gün çalışırsa işin $\frac{7}{15}$ i bitmektedir.

Buna göre, Esat bu işin tamamını tek başına kaç günde bitirebilir?

Arda and Esat can complete a work together in 5 days. If Arda works for 2 days and Esat works for 3 days, they can complete $\frac{7}{15}$ of the work.

Accordingly, how many days does Esat need to complete this work alone?

A) 10 B) 12 C) 15 D) 18 E) 20

3. Emre bir işin $\frac{1}{7}$ sini tamamladıktan sonra kapasitesini 3 katına çıkararak kalan işi 5 günde bitirmektedir.

Buna göre, Emre normal şartlarda işin tamamını kaç günde bitirebilir?

After Emre completes $\frac{1}{7}$ of a work, he increases his capacity to 3 times and finishes the remaining part in 5 days.

Accordingly, how many days does it take for Emre to complete the whole work normally?

A) 35 B) $\frac{35}{2}$ C) 17 D) $\frac{33}{2}$ E) 16

4. Muteber 3 saatte 5 adet pasta, Zübeyde ise 4 saatte 3 adet pasta yapabilmektedir.

Buna göre, ikisi birlikte 58 adet pastayı kaç saatte bitirebilirler?

Muteber can make 5 cakes in 3 hours but Zubeyde can make 3 cakes in 4 hours.

Accordingly, how many hours do they need to make 58 cakes together?

A) 12 B) 16 C) 20 D) 24 E) 28

5. Fatma bir işi 9, Muhammed ise 7 günde yapabilmektedir.

Buna göre, ikisi birlikte işin $\frac{8}{21}$ sini kaç günde yapabilirler?

Fatma completes a work in 9 days but Muhammed completes it in 7 days.

Accordingly, how many days does it take for them to complete $\frac{8}{21}$ of the same work?

A) 3 B) 2 C) $\frac{3}{2}$ D) 1 E) $\frac{1}{2}$

6. x tane işçi bir işi günde 14 saat çalışarak 18 günde bitirmekdir. İşçi sayısı belli bir miktar arttırılarak günde 12 saat çalışıp aynı işi 15 günde bitirmektedir.

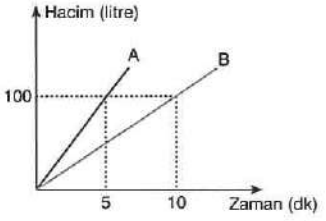
Buna göre, x aşağıdakilerden hangisi olabilir?

x workers can complete a job in 18 days by working 14 hours a day. If the number of workers is increased by a centain amount the same job can be completed in 15 days by working 12 hours a day.

Accordingly, what can be the possible value of x?

A) 21 B) 16 C) 12 D) 10 E) 8

7.



A ve B musluklarının zamana göre akıttıkları su miktarı grafikte verilmiştir. A ve B musluklarının birlikte 18 dakikada doldurdukları bir havuz vardır.

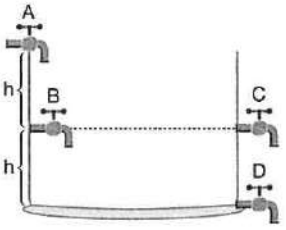
A musluğundan dakikada akan su miktarı 2 katına, B musluğundan dakikada akan su miktarı 5 katına çıkarıldığında aynı havuz kaç dakikada dolar?

The amount of water flowing from faucets A and B is shown in the figure. Both faucets can together fill a pool in 18 minutes.

If the capacities of faucets A and B are respectively increased to 2 times and 5 times, how many minutes are required to fill the same pool?

A) 5 B) 6 C) 7 D) 8 E) 9

8.



A ve B muslukları özdeş olup tek başlarına boş havuzu 6 saatte doldurabilmektedirler. C ve D muslukları da özdeş olan ve dolu havuzu tek başlarına 8 saatte boşaltabilen musluklardır.

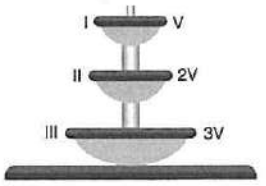
Buna göre, havuz boşken tüm musluklar açıldığında havuzun tamamı kaç saatte dolabilir?

Faucets A and B are identical and can fill an empty pool separately in 6 hours. Faucets C and D are identical and can empty a full pool separately in 8 hours.

If all four faucets are opened at the same time, how many hours does it take to fill this pool?

A) 9 B) $\frac{42}{5}$ C) 8 D) $\frac{39}{5}$ E) 7

9.



Şekildeki fıskiyeden çıkan sular I. havuzu, aradan taşan sular II. havuzu ve sonra da III. havuzu doldurmaktadır. I. havuzun dolma süresi 3 saattir.

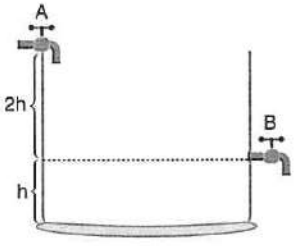
Buna göre, fıskiyeden 10 saat su aktığında III. havuzun kaçta kaçı dolmuş olur?

Water flowing out of a fountain fills pools I, II and III orderly. Pool I is filled in 3 hours.

Accordingly, what ratio of pool III is filled if water flows out this fountain for 10 hours?

A) $\frac{1}{6}$ B) $\frac{1}{7}$ C) $\frac{1}{8}$ D) $\frac{1}{9}$ E) $\frac{1}{10}$

10.



A musluğu boş havuzu tek başına 12 saatte doldurmaktadır. B musluğu ise tek başına havuzun kendi seviyesine kadar ki kısmını 18 saatte boşaltabilmektedir.

Buna göre, A ve B muslukları birlikte havuzu kaç saatte doldurabilirler?

Faucet A fills an empty pool in 12 hours. Faucet B empties a part of full the pool to its level in 18 hours.

Accordingly, how many hours does it take for faucets A and B to fill this pool together?

A) $\frac{92}{5}$ B) $\frac{72}{5}$ C) 14 D) 13 E) $\frac{62}{5}$

1-A 2-C 3-B 4-D 5-C 6-D 7-B 8-B 9-D 10-A

1. 140 sayısının % 40'ı kaçtır?

What is the 40% of the number 140?

A) 60 B) 56 C) 50 D) 42 E) 28

2. 250 sayısının % 30'unun % 20'si kaçtır?

What is the 20% of 30% of the number 250?

A) 20 B) 18 C) 15 D) 13 E) 12

3. % 15'i 60 olan sayı kaçtır?

What is the number whose 15% is 60?

A) 400 B) 350 C) 300 D) 250 E) 200

4. Hangi sayının % 10'unun 15 fazlası aynı sayının $\frac{2}{5}$'ine eşittir?

15 more than 10% of which number is $\frac{2}{5}$ of the same number?

A) 90 B) 80 C) 70 D) 60 E) 50

5. a sayısının % 20'si b sayısına, b sayısının % 40'ı da c sayısına eşittir.

Buna göre, c sayısı a sayısının % kaçıdır?

20% of number a is equal to number b and 40% of number b is equal to number c.

Number c is what % of number a?

A) 8 B) 10 C) 15 D) 20 E) 28

6. Bir çocuk kitabının önce % 20'sini, sonra kalanın % 30'unu okuyor. 280 sayfa daha okuduğunda kitabı bitiyor.

Buna göre, kitap kaç sayfadır?

A child reads 20% of a book then he reads 30% of remaining part of the book. If he reads extra 280 pages, the book is completed.

Accordingly, how many pages is the book?

A) 410 B) 440 C) 490 D) 500 E) 550

7. Bir konferans salonunun % 15'i doludur.

Salona 180 izleyici geldiğinde salonun % 40'ı dolduğuna göre, konferans salonu toplam kaç kişi almaktadır?

15% of a conference is full. If 180 people join the audience, 40% of the room becomes full.

How many people is the capacity of the conference room?

A) 700 B) 720 C) 760 D) 800 E) 840

8. Bir ürünün satış fiyatı yılın ilk 6 ayında % 40 artmış, 2. 6 ayında ise % 40 azalmıştır.

Buna göre, bir yılın sonunda ürünün fiyatı, yılın başına göre % kaçlık bir değişime uğramıştır?
In the first 6 months of a year, there is 40% increase in sales of a product. In the second 6 months of the year, there is 40% decrease in sales of this product.

Accordingly, at the end of this year, what % change happens in the sales of product?

A) % 16 azalmıştır (decreases)
B) % 16 artmıştır (increases)
C) Değişmemiştir (does not change)
D) % 40 azalmıştır (decreases)
E) % 40 artmıştır (increases)

9. Almanca veya ingilizce bilen insanların oluşturduğu 180 kişilik bir toplulukta her iki dili konuşanlar topluluğun % 70'idir. Sadece almanca konuşanlar topluluğun % 10'udur.

Buna göre, bu toplulukta sadece ingilizce konuşan kaç kişi vardır?
There is a group of 180 people who speak either German or English. 70% of these people speak both languages but 10% of the people speak only German.

Accordingly, how many people speak only English?

A) 32 B) 36 C) 38 D) 40 E) 42

10. Bir kişi almış olduğu maaşın % 20'sini ev kirasına, % 15'ini mutfak masrafına harcamaktadır.

Bu masraflar dışında kalan parası 1950 lira ise mutfak masrafı kaç liradır?
A man spends 20% of his salary on house rent, 15% of his salary on kitchen expenses.

If he has left 1950 TL, how many TL are kitchen expenses?

A) 400 B) 450 C) 500 D) 550 E) 600

11. Bir sınava kayıt yaptıran 200 kişinin % 40'ı erkektir.

Eğer sınava 60 kız ve 40 erkek daha kayıt yaptırırsa erkek sayısı tüm kayıt yaptıranların yüzde kaçı olur?
40% of 200 people registered for an exam is male.

If extra 60 females and 40 males register for this exam, what % of all registered people is male?

A) 30 B) 40 C) 48 D) 50 E) 52

12. Nalan'ın parasının % 65'i, Nisanur'un parasının % 85'ine eşittir.

Buna göre, Nalan parasının % kaçını Nisanur'a verirse ikisinin paraları eşit olur?
65% of Nalan's money is equal to 85% of Nisanur's money.

Their money will be equal if Nalan gives what % of her money to Nisanur?

A) $\frac{50}{17}$ B) $\frac{100}{17}$ C) $\frac{200}{17}$ D) $\frac{300}{17}$ E) $\frac{300}{13}$

13. Bir miktar buğdayın % 20'si kadar daha fazla bir hamur elde edilmekte, hamurdan da % 80'i kadar ekmek yapılmaktadır.

Buna göre, 60 kg buğdaydan kaç kg ekmek elde edilebilir?
20% more dough is made from a centain amount of wheat. Bread is made as much as 80% of dough.

Accordingly, how many kilos of bread is made of 60 kg wheat?

A) $\frac{144}{5}$ B) $\frac{288}{5}$ C) 40 D) $\frac{193}{5}$ E) 38

1-B 2-C 3-A 4-E 5-A 6-D 7-B 8-A 9-B 10-B 11-B 12-C 13-B

1. **Bir bankaya basit faiz ile yatırılan 80 TL, yıllık % 40 faizle 1 yılda kaç TL faiz geliri getirir?**
How much interest does 80 TL deposited in the bank with 40% annual simple interest rate bring in 1 year?

A) 32 B) 112 C) 152 D) 252 E) 320

2. **Bir bankaya basit faiz ile yatırılan 2000 TL, yıllık % 30 faizle 3 ayda kaç TL faiz geliri getirir?**
How much interest does 2000 TL deposited in the bank with 30% annual simple interest rate bring in 3 months?

A) 100 B) 150 C) 200 D) 250 E) 300

3. **Bir bankaya basit faiz ile yatırılan 1800 TL, yıllık % 20 faizle 50 günlüğüne kaç TL faiz kazandırır?**
How much interest does 180 TL deposited in the bank with 20% annual simple interest rate bring in 50 days?

A) 90 B) 80 C) 70 D) 60 E) 50

4. Bir kişi 1400 TL'sini basit faiz ile yıllık % 18 faizle bir bankaya yatırmıştır.

2 yıl sonra faizi ile birlikte bankadan çekilen bu para kaç TL dir?
How much does 1400 TL deposited by a man in the bank with 18% annual simple interest rate become at the end of 2 years?

A) 504 B) 804 C) 1524 D) 1904 E) 1950

5. Bir bankaya basit faizle yatırılan bir miktar para 7 ay sonra bankadan çekildiğinde faizi ile birlikte 740 lira olmaktadır.

Bankanın uyguladığı faiz oranı yıllık % 40 olduğuna göre, bankaya başlangıçta kaç TL para yatırılmıştır?
A certain amount of money is deposited in the bank for 7 months then all money with its obtained interest is 740 TL.

If annual simple interest rate is 40%, how many TL is the capital initially?

A) 540 B) 600 C) 660 D) 700 E) 720

6. Bir miktar paranın $\frac{1}{3}$ ü A bankasına basit faizle yıllık % 20 faiz oranı ile 3 yıllığına, kalanı ise B bankasına basit faizle yıllık % 40 faiz oranı ile 2 yıllığına yatırılmıştır.

İki bankadan elde edilen toplam faiz 7700 TL ise bankalara yatırılan toplam para kaç TL dir?
$\frac{1}{3}$ of a certain amount of a money is deposited in bank A with 20% annual simple interest rate for 3 years. The remaining part of the money is deposited in bank B with 40% annual simple interest rate for 2 years.

If all deposited money in banks A and B brings total 7700 TL interest, how many TL is the money deposited initially?

A) 9500 B) 10000 C) 10500 D) 11000 E) 11500

7. **Yıllık % 2 bileşik faiz ile bankaya yatırılan 300 TL, 2 yıl sonra kaç TL olur?**
How much does 300 TL deposited in the bank with 2% annual compound interest rate become after 2 years?

A) 312 B) 312,12 C) 312,14 D) 312,16 E) 312,18

8. Yıllık % 20 bileşik faizle bankaya yatırılan bir miktar para 10 yıl sonra bankadan tamamı 1500 . $\left(\frac{6}{5}\right)^{11}$ TL olarak çekildiğine göre, bankaya yatırılan ana para kaç TL dir?

A capital is deposited in the bank with 20% annual compound interest rate. If it becomes 1500 . $\left(\frac{6}{5}\right)^{11}$ TL after 10 years, how many TL is the capital?

A) 1400 B) 1500 C) 1600 D) 1700 E) 1800

9. 1700 TL yıllık % x basit faizle bir bankaya 3 yıllığına yatırılmış ve süre sonunda faizi ile birlikte 4760 TL olarak bankadan alınmıştır.

Buna göre, x kaçtır?

1700 TL is deposited in the bank with x% annual simple interest rate.

If this money becomes 4760 TL at the end of 3 years, what is the value of x?

A) 57 B) 59 C) 60 D) 61 E) 63

10. Bir miktar paranın yarısı A bankasına yıllık % x basit faizle 4 yıllığına, diğer yarısı % (x – 7) basit faizle 4 yıllığına B bankasına yatırılıyor.

4 yıl sonunda elde edilen faiz gelirlerinin farkı 2100 TL olduğuna göre, A veya B bankasına yatırılan para kaç TL dir?

A half of a capital is deposited in bank A for 4 years with x% annual simple interest rate. Another half is deposited in bank B for 4 years with (x – 7)% annual simple interest rate.

The difference of interests they bring at the end of 4 years is 2100 TL. What is the amount of money deposited in bank A or B?

A) 6000 B) 7200 C) 7500 D) 12000 E) 15000

11. 1 doların 6 TL olduğu bir dönemde 800 doları olan bir kişi, parasını dolara yıllık % 25 basit faiz veren bir bankaya 1 yıllığına yatırmıştır. Aynı kişi parasını TL olarak yıllık % 5 basit faiz veren bir bankaya 1 yıllığına yatırmış olsaydı her iki durumda da elindeki para değişmeyecekti.

Buna göre 1 yıl sonunda dolar kaç TL olmuştur?

When $1 is 6 TL, a man deposits his $800 for 1 year in a bank with 25% annual simple interest rate. If he deposited this money as liras for 1 year in a bank with 5% annual simple interest rate, he would have the same amount of money at the end of 1 year.

Accordingly, how many TL is $1 at the end of 1 year?

A) 6,01 B) 5,04 C) 5,01 D) 5 E) 4,9

12. Bir adam parasını yıllık % x basit faizle n yıllığına bankaya yatırdığında elde ettiği faiz geliri ile yıllık % (x – 2) basit faizle 2n yıllığına yatırdığında elde ettiği faiz geliri aynıdır.

Buna göre, x kaçtır?

A certain amount of money brings the same interest if it is either deposited for n years with x% annual simple interest rate or deposited for 2n years with (x – 2)% annual simple interest rate.

Accordingly, what is x?

A) 7 B) 6 C) 5 D) 4 E) 3

13. 200 lirasını yıllık % 20 bileşik faizle 2 yıllığına bankaya yatıran bir adam aynı parayı yıllık % x faizle 2 yıllığına basit faizle başka bir bankaya yatırdığında da aynı parayı elde ediyor.

Buna göre, x kaçtır?

200 TL brings the same amount of interest for 2 years, if it is either deposited with 20% annual compound interest rate or deposited with x% annual simple interest rate.

Accordingly, what is x?

A) 22 B) 23 C) 24 D) 25 E) 26

1-A 2-B 3-E 4-D 5-B 6-C 7-B 8-E 9-C 10-C 11-B 12-D 13-A

1. Bir etek ve kazağın toplam fiyatı 480 TL dir. Eteğin fiyatı kazağın fiyatının 3 katıdır.

Buna göre, eteğin fiyatı % 20 azaltılır, kazağın fiyatı % 40 arttırılırsa son durumda ikisinin toplam fiyatı kaç TL olur?

Total price of a skirt and a sweater is 480 TL. The price of a skirt is triple the price of a sweater.

Accordingly, if the price of a skirt is decreased by 20% but the price of a sweater is increased by 40%, what is new total price of a skirt and a sweater?

A) 450 B) 456 C) 460 D) 466 E) 476

2. Bir sınıfta matematikten başarılı olanlar sınıfın % 75'i matematikten 7 ve üzeri not alanlar da başarı gösterenlerin % 40'ıdır. Sınıftaki öğrencilerin % 85'i de Türkçe'den başarılıdır.

Buna göre, Türkçe'den başarılı olanlardan matematik notu 7 ve üzeri olanlar <u>en az</u> yüzde kaçtır?

75% of students in a class is successful in mathematics and 40% of the successful students gets 7 or higher grades in mathematics. Also, 85% of this class is successful in Turkish lesson.

Accordingly, <u>at least</u> what percent of the class who is successful in Turkish also gets 7 or higher grades in mathematics?

A) 15 B) 18 C) 24 D) 30 E) 33

3. Mevsim sonunda indirim yapan bir ayakkabı mağazası ilk hafta % 20, ikinci haftada ilk hafta yapılan indirim üzerinden % 20 daha indirim yapmıştır.

Buna göre, mağaza iki hafta boyunca toplam yüzde kaç indirim yapmıştır?

A shoe store makes a 20% discount first week then it makes 20% discount second week for the already discounted prices.

Accordingly, how many % total discount does this store make during two weeks?

A) 33 B) 36 C) 39 D) 40 E) 42

4. Bir öğrenci her gün x adet matematik, y adet Türkçe, z adet tarih sorusu çözmektedir. Bu öğrenci hergün çözdüğü matematik soru sayısını % 40 artırır, Türkçe soru sayısını % 10 azaltır ve tarih soru sayısını da % 15 azaltırsa günlük çözdüğü toplam soru sayısı değişmemektedir.

Buna göre; x, y ve z arasındaki bağıntı aşağıdaki şıkların hangisinde doğru olarak verilmiştir?

A student solves daily x mathematics, y Turkish and z history questions. If this student increases the number of mathematics questions by 40% but decreases the numbers of Turkish and history questions by 10% and 15% respectively, the total number of questions he solves does not change.

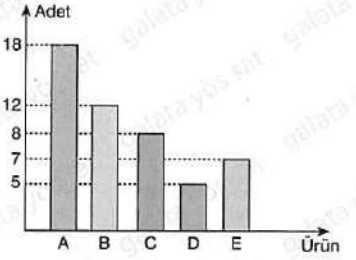
Accordingly, what is the relation of x, y and z?

A) $2y + 3z = 8x$ B) $2x + 8y = 3z$

C) $x + 2y = 3z$ D) $8x + 3y = 2z$

E) $x + 3y = 8z$

5.



Yukarıdaki tabloda bir markette satılan A, B, C, D ve E marka deterjanların haftalık satış miktarları verilmiştir.

Buna göre, 1 hafta içinde satılan deterjanlardan C marka deterjan toplamın yüzde kaçını oluşturmaktadır?

The numbers of weekly sales of detergents A, B, C, D and E are show in figure above.

Accordingly, what percent of all weekly sales is of detergent C?

A) 10 B) 14 C) 16 D) 24 E) 36

6. İki kişinin sermaye koyarak oluşturduğu bir şirkette A kişisi sermayenin $\frac{3}{10}$'unu, geri kalanını da B kişisi koymuştur.

Buna göre, B kişisi A kişisinin koyduğu sermayenin yüzde kaçı kadar fazla sermaye koymuş olur?

Person A and person B establish a company together. $\frac{3}{10}$ of whole capital is given by person A and remaining is given by person B.

What percent of the capital given by A is equal to the capital given by B?

A) 100 B) 150 C) $\frac{400}{3}$ D) $\frac{440}{3}$ E) $\frac{500}{3}$

7. Bir okuldaki erkek öğrencilerin sayısı, kız öğrencilerin sayısının % 30'u kadardır.

Bu okuldaki erkek öğrenci sayısı 30'dan çok olduğuna göre, en az kaç kız öğrenci vardır?

The number of male students in a school is 30% of female students.

If the number of male students is more than 30, what is the least number of female students?

A) 110 B) 112 C) 113 D) 114 E) 115

8. A okulundaki öğrencilerin % 72'si kız, B okulundaki öğrencilerinde % 42'si kızdır.

A ve B okulundaki tüm öğrencilerin % 58'i kız olduğuna göre, A okulundaki öğrenci sayısı B okulundaki öğrenci sayısının kaç katıdır?

The number of female students is 72% in school A but this number is 42% in school B.

If the number of all female students in schools A and B is 58%, what is the ratio of numbers of all students in school A to B?

A) $\frac{8}{7}$ B) 1 C) $\frac{7}{8}$ D) $\frac{7}{9}$ E) $\frac{6}{11}$

9. Mehmet parasının $\frac{2}{5}$'ini yıllık % 60, kalanını yıllık % 25 basit faizle 4 aylığına bir bankaya yatırıyor. Eğer Mehmet parasının $\frac{2}{5}$'ini % 25, kalanını da % 60 basit faizle 4 aylığına bankaya yatırsaydı 140 TL daha fazla faiz geliri elde edecekti.

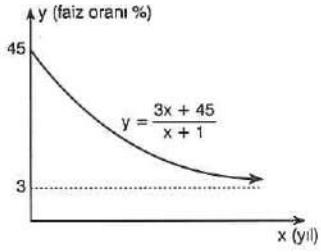
Buna göre, Mehmet'in toplam parası kaç liradır?

Mehmet deposits, $\frac{2}{5}$ of his money with 60% annual simple intevest rates but the rest with 25% annual simple interet rates in a bank for 4 months. If Mehmet deposited $\frac{2}{5}$ of his money with 25% annual simple interest rates but the rest with 60% annual simple interest rates in the bank for 4 months, he would get 140 TL more interests.

Accordingly, what is the total amount of Mehmet's money?

A) 1200 B) 2400 C) 4600 D) 5800 E) 6000

10.



Yukarıdaki grafikte bir bankanın çiftçilere uygulayacağı basit faiz oranını belirleyen $y = \frac{3x + 45}{x + 1}$ bağıntısının grafiği verilmiştir.

Buna göre, kaçıncı yıldan sonra yıllık faiz oranı % 9'un altına düşer?

In above graph, annual simple interest rates applied to farmers illustrated by the formula $y = \frac{3x + 45}{x + 1}$.

Accordingly, after which year do annual simple interest rates become less than 9%?

A) 6 B) 5 C) 4 D) 3 E) 2

1-B 2-A 3-B 4-A 5-C 6-C 7-A 8-A 9-E 10-A

1. **% 20 kârla 360 TL'ye satılan bir gömleğin maliyeti kaç TL'dir?**
How many TL is the price of a shirt whose price with 20% profit is 360 TL?

A) 220 B) 300 C) 330 D) 400 E) 440

2. Tanesi 100 TL olan bir kazak çeşidine önce % 20 indirim uygulanmıştır.

Yeterli satış olmayınca ilk indirim üzerinden % 20 daha indirim yapılarak satılan kazakların tanesi kaç liradır?
20% discount is made for a sweater with 100 TL initial cost. Because the sale is not satisfactory, extra 20% discount is made for already discounted price.
What is the final price of a sweater?

A) 80 B) 66 C) 64 D) 60 E) 54

3. 60 liraya alınan bir ürün 75 liraya satılmıştır.

Buna göre, ürüne yapılan zam oranı % kaçtır?
A product is bought for 60 TL but it is sold for 75 TL.
How much % raise is made for this product?

A) 15 B) 18 C) 20 D) 25 E) 30

4. **Maliyet fiyatının % 10 eksiğine alınan ve maliyet fiyatının % 35 fazlasına satılan bir üründen yüzde kaç kâr elde edilmiştir?**
A product is bought with the price 10% less than its cost but it is sold with the price 35% more than its cost.
How much % profit is made from the sale?

A) 30 B) 35 C) 40 D) 45 E) 50

5. 36 adet yumurtanın 6 tanesi taşıma sırasında kırılmıştır.

Buna göre, yumurtalardan birinin maliyeti % kaç artmıştır?
If 6 of 36 eggs are broken, how much % does the cost of an egg increase?

A) 10 B) 15 C) 18 D) 20 E) 22

6. Bir tüccar malının % 20'sini % 20 kârla, % 30'unu % 40 zararla satmıştır.

Buna göre, tüccar kalan malını % kaç kârla satarsa tüm malın satışından herhangi bir kâr veya zarar edilmemiş olur?
A seller sells 20% of goods with 20% profit but 30% of goods with 40% loss.
Accordingly, what % profit should the seller make of the sale of remaining goods if he wants to make no profit or loss?

A) 50 B) 42 C) 36 D) 24 E) 16

7. Bir dükkanda satılan ürünlere % 40'lık bir indirim uygulandığında günlük satışlarda % 50'lik bir artış gözlemlenmiştir.

Buna göre, dükkanın günlük elde ettiği para eski duruma göre ne oranda değişmiştir?
There is a 50% raise in sales as a result of 40% discounts made in a store.
What % change happens in making money as a result of the sale at the end of a day?

A) % 10 azalmıştır (decreases)
B) % 10 artmıştır (increases)
C) % 90 artmıştır (increases)
D) % 90 azalmıştır (decreases)
E) % 70 azalmıştır (decreases)

8. b liraya alınan bir ürün a liraya satılmıştır. a ile b arasında a = 3b + 400 bağıntısı vardır.

Alış fiyatı satış fiyatının % 20'si olarak hesaplandığına göre ürünün alış fiyatı kaç TL'dir?

The cost of a product is b TL, the selling price of the product is a TL. There is a relation between a and b given by a = 3b + 400.

If the cost of this product is 20% of its selling price, how many TL is the cost?

A) 200 B) 400 C) 600 D) 800 E) 1000

9. Tanesi 14 liraya satılan x adet sandalyeden 500 TL kâr elde edilmiştir. Eğer sandalyelerin tanesi 7 liradan satılsaydı 270 lira zarar edilecekti.

Buna göre, x kaçtır?

500 TL profit is made from the sale of x chairs each of them costs 14 TL. There would be 270 TL loss if each chair was sold for 7 TL.

What is x?

A) 70 B) 100 C) 110 D) 140 E) 170

10. Bir maç için insan taşıyan 42 otobüs ve 72 minibüs bulunmaktadır. Otobüslerin tamamı taşınacak insanların %72'sini, minibüslerin tamamı ise taşınacak insanların % 36'sını taşıyabilmektedir.

Bir otobüs tek seferde 24 kişi taşıyabildiğine göre, bir minibüs tek seferde kaç kişi taşıyabilir?

There are 42 buses and 72 minibuses. All buses can transport 72% of people going to a match but minibuses can only transport 36% of these people.

If a bus can transport 24 people each time, how many people can a minibus transport each time?

A) 7 B) 8 C) 9 D) 10 E) 11

11. Kilosu 15 liradan alınan yaş üzüm kuruyunca ağırlığının % 40'ını kaybetmektedir.

Buna göre, kuru üzümün kilosu kaç liraya satılırsa %8 kâr elde edilir?

The price for 1 kg of fresh grapes is 15 TL. When it dries, fresh grapes loses 40% of its weight.

What is the price with 8% profit for 1 kg of raisins?

A) 22 B) 24 C) 25 D) 27 E) 28

12. Bir kişi 112 dolarını martta, 200 dolarını nisanda Türk lirasına çevirmiştir. Eğer bu kişi 200 dolarını martta, 112 dolarını nisanda Türk lirasına çevirseydi 176 TL kâr elde edilecekti.

Buna göre, dolar nisan ayında mart ayına göre kaç TL artmıştır?

A man exchanges $112 in march and $200 in april into TL. If he exchanged $200 in march and $112 in april, he would make 176 TL profit.

How many TL does $1 increase in april compared to march?

A) 1 B) 2 C) 2,4 D) 2,8 E) 3

13. Maliyeti a lira olan bir ürün % 40 kârla b liraya, etiket fiyatı b lira olan bir üründe % 40 indirimle c liraya satılmaktadır.

Buna göre; a, b, c arasındaki bağıntı aşağıdakilerden hangisinde doğru olarak verilmiştir?

The cost of a product is a TL and its sale price with 40% profit is b TL. Another product costs b TL but it is sold for c TL with 40% discount.

What is the relation between a, b and c?

A) 7a = 3b = 25c B) 21a = 5b = 7c C) a = 2b = 3c D) a = 4b = 16c E) 21a = 15b = 25c

1-B 2-C 3-D 4-E 5-D 6-E 7-A 8-A 9-C 10-A 11-D 12-B 13-E

1. Tuz oranı % 20 olan 100 gram tuzlu su ile tuz oranı %25 olan 150 gram tuzlu su karıştırılıyor.

Buna göre, yeni karışımın tuz oranı yüzde kaçtır?
A mixture is obtained by mixing 100 gram of salty water with salt ratio of 20% and 150 grams of salty water with salt ratio of 25%.

What % is the salt ratio of the new mixture?

A) 21 B) 22 C) 23 D) 24 E) 25

2. Şeker oranı % 12 olan 55 litre şekerli su ile şeker oranı % 20 olan 45 litre şekerli su karıştırılıyor.

Buna göre, oluşan yeni karışımın şeker yüzdesi kaçtır?
In order to obtain a new mixture, 55 liters of sugared water with sugar ratio of 12% and 45 liters of sugared water with sugar ratio of 20% are mixed.

What % is the sugar ratio of the new mixture?

A) 14 B) 15 C) 15,2 D) 15,4 E) 15,6

3. Şeker oranı % 25 olan 80 litre şekerli su ile su oranı %40 olan 40 litre şekerli su karıştırılıyor.

Buna göre, oluşan karışımın su yüzdesi kaçtır?
80 liters of sugared water with sugar ratio of 25% and 40 liters of sugared water with water ratio of 40% are mixed to get a new mixture.

What % is the water ratio of this new mixture?

A) $\frac{190}{3}$ B) 95 C) 95,5 D) 96 E) 96,5

4. Şeker oranı % 72 olan 50 litre şekerli su ile 150 litre saf su karıştırılarak yeni bir karışım elde edilmiştir.

Buna göre, yeni karışımın şeker oranı yüzde kaçtır?
150 liters of pure water is added to 50 liters of sugared water with sugar ratio of 72%.

What % is the sugar ratio of the new mixture?

A) 15 B) 18 C) 19 D) 21 E) 22

5. Şeker oranı % 10 olan 48 litre şekerli su ile 8 kilogram şeker karıştırılıyor.

Buna göre, oluşan yeni karışımın şeker oranı yüzde kaçtır?
8 kilograms of sugar is added to 48 liters of sugared water with sugar ratio of 10%.

What % is the sugar ratio of the new mixture?

A) $\frac{170}{7}$ B) $\frac{167}{7}$ C) $\frac{163}{7}$ D) $\frac{160}{7}$ E) $\frac{150}{7}$

6. Şeker oranı % 15 olan a litre şekerli su ile şeker oranı %18 olan 40 litre şekerli su karıştırılıyor.

Oluşan yeni karışımın şeker oranı % 17 olduğuna göre, a kaçtır?
a liters of sugared water with sugar ratio of 15% and 40 liters of sugared water with sugar ratio of 18% are mixed.

If the sugar ratio of the new mixture is 17%, what is a?

A) 12 B) 14 C) 16 D) 18 E) 20

7. % 15'i tuz olan 80 gramlık bir tuz su karışımından 20 gram su buharlaştırılıyor.

Buna göre, yeni oluşan karışımın tuz yüzdesi kaç olur?

20 grams of water is evaporated from 80 grams of salty water mixture with salt rate of 15%.

What % is the salt rate of this new mixture?

A) 24 B) 23 C) 22 D) 21 E) 20

8. **% 40'ı şeker olan 100 gramlık bir karışıma 10 gram şeker ekleyip, 10 gram da su buharlaştırılırsa yeni oluşan karışımın şeker yüzdesi kaç olur?**

If 10 grams of sugar is added to 100 grams of sugared water mixture with sugar rate of 40%, then 10 grams of water is evaporated from the same mixture, what % will sugar rate of the new obtained mixture be?

A) 50 B) 48 C) 46 D) 45 E) 44

9. **% 16'sı şeker olan 75 gramlık şeker su karışımına 21 gram tuz eklendiğinde oluşan yeni karışımın şeker yüzdesi kaç olur?**

If 21 grams of salt is added to 75 grams of sugared water with sugar rate of 16%, what % will sugar rate of the mixture become?

A) 10 B) 12 C) 12,5 D) 13 E) 15,5

10. % 25'i şeker olan x kg şeker su karışımından 10 kg su buharlaştırıldığında kalan karışımın şeker oranı % 50 olmaktadır.

Buna göre, x kaçtır?

If 10 kg of water is evaporated from x kg of sugared water mixture with sugar ratio of 25%, the sugar ratio of the new mixture becomes 50%.

Accordingly, what is x?

A) 18 B) 20 C) 22 D) 25 E) 27

11. Su oranı % 75 olan 300 litre tuzlu su ile su oranı % 45 olan 200 litre tuzlu su karıştırılıyor.

Buna göre, oluşan karışıma ne kadar daha su eklenirse yeni karışımın su oranı % 75 olur?

300 liters of salty water with water ratio of 75% and 200 liters of salty water with water ratio of 45% are mixed.

How many liters of water should be added to this mixture so that its water ratio becomes 75%?

A) 200 B) 210 C) 220 D) 240 E) 270

12. Şeker oranı $\frac{2}{7}$ olan bir un şeker karışımına 60 gram daha şeker konduğunda yeni karışımın şeker oranı % 40'a çıkmıştır.

Buna göre, başlangıçtaki karışımın ağırlığı kaç gramdır?

If 60 grams of sugar is added to sugar - flour mixture with sugar ratio of $\frac{2}{7}$, the sugar ratio of new mixture becomes 40%.

Accordingly, what is the weight of the initial mixture?

A) 275 B) 285 C) 295 D) 305 E) 315

1-C 2-E 3-A 4-B 5-D 6-E 7-E 8-A 9-C 10-B 11-D 12-E

1. **13 kg baldo, 37 kg osmancık pirinci içeren bir çuvaldaki baldo pirincin oranını % 75'e çıkarmak için çuvala kaç kg daha baldo pirinç eklenmelidir?**
A sack of rice contains only 13 kg of baldo rice and 37 kg of osmancık rice. How many kg of extra baldo rice should be added to this sack in order to raise its ratio of baldo rice to 75%?

A) 92 B) 94 C) 96 D) 98 E) 100

2. Su yüzdesi % 60 olan bir limonata ile su yüzdesi % 70 olan başka bir limonata karıştırılıyor.

Su oranı % 60 olan limonatanın miktarı diğer limonatadan fazla olduğuna göre, karışımın su yüzdesi aşağıdakilerden hangisi olabilir?
Two lemonades with water ratios 60% and 70% are mixed. If the amount of the lemonade with water ratio 60% is greater, what % could be water ratio of this mixture?

A) 64 B) 65 C) 66 D) 67 E) 68

3. % 15'i şeker, % 20'sı süt olan bir kekin kalan kısmı undur.

Un miktarı 130 gram olan bu kekten 2 adet yapmayı planlayan bir kişinin kullandığı süt miktarı şeker miktarından kaç gram fazladır?
A cake is made of 15% sugar, 20% milk and the rest is flour.
The amount of flour in a cake is 130 grams. In order to make 2 cakes, how many grams is the amount of milk more than the amount of sugar?

A) 10 B) 15 C) 20 D) 25 E) 30

4. Bir havuzu dolduran A musluğunun havuzu doldurma süresi 8 saat olup % 20'lik tuzlu su akmaktadır. Havuzu tek başına 12 saatte dolduran başka bir B musluğuda % 30'luk tuzlu su akıtmaktadır.

Buna göre, iki musluk birlikte açılıp havuz dolduğunda havuzdaki suyun tuz oranı % kaç olur?
Faucet A can fill a pool in 8 hours and it flows salty water with salt ratio of 20%. Faucet B can fill the pool in 12 hours and it flows salty water with salt ratio of 30%. Both faucets are opened at the same time.
Accordingly, what will be the salt ratio of water in the pool when it is full?

A) 29 B) 28 C) 27 D) 26 E) 24

5. **% 12'si tuz olan bir karışımdaki tüm su buharlaştırıldığında geriye 6 kg tuz kaldığına göre karışımdaki su miktarı başlangıçta kaç litredir?**
When all the water in salty water mixture with salt ratio of 12% is evaporated, 6 kg of salt is left.
How many liters of water are there in the mixture at the beginning?

A) 30 B) 34 C) 38 D) 44 E) 46

6. % 28'i tuz olan 40 litre tuzlu su ile % 42'si şeker olan 30 litre şekerli su karıştırılıyor.

Buna göre, son durumda karışımdaki tuz oranı % kaç olur?
40 liters of salty water with salt ratio of 28% and 30 liters of sugared water with sugar ratio of 42% are mixed.
What % is the salt ratio in the final mixture?

A) 18 B) 17 C) 16 D) 15 E) 14

7. Şeker oranı % 17 olan 3a litrelik şeker - su karışımının $\frac{1}{3}$'ü ile şeker oranı % 27 olan 2a litrelik şeker - su karışımının $\frac{1}{2}$'si karıştırılıyor.

Buna göre, oluşan yeni karışımın şeker yüzdesi kaçtır?

$\frac{1}{3}$ of 3a liters of sugared water with sugar ratio of 17% and $\frac{1}{2}$ of 2a liters of sugared water with sugar ratio of 27% are mixed.

What % is the sugar ratio of new mixture?

A) 44 B) 33 C) 22 D) 11 E) 10

8. **Şeker oranı % 44 olan 350 ml lik karışıma 46 ml şeker ilave edildiğinde oluşan karışımın şeker oranı yaklaşık yüzde kaçtır?**

If 46 ml sugar is added to 350 ml of sugared water with sugar ratio of 44%, what % is the apporoximate ratio of sugar in the new mixture?

A) 47 B) 48 C) 49 D) 51 E) 55

9. Bir A kabında ağırlıkça % 44 şeker olan 40 litre, B kabında ağırlıkça % 20'si şeker olan 20 litre şekerli su vardır. Önce A kabında bulunan karışımın yarısı B kabına dökülüyor. Daha sonra B kabında oluşan karışımın yarısı da A kabına dökülüyor.

Buna göre, son olarak A kabında oluşan karışımın şeker oranı yüzde kaçtır?

There is 40 liters of sugared water in container A with sugar ratio of 44%. There is 20 liters of sugared water in container B with sugar ratio of 20%. Firstly, the half of mixture in container A is added to container B. Then the half of mixture obtained in B is added to container A.

What % is the sugar ratio of final mixture in container A?

A) 32 B) 34 C) 35 D) 36 E) 38

10. % 60'ı limon suyu olan bir limonatanın $\frac{1}{5}$'i alınarak yerine alınan miktar kadar mandalina suyu konmuştur.

Buna göre, son durumda limonatanın yüzde kaçı limon suyudur?

$\frac{1}{5}$ of a lemonade with 60% lemon juice is removed and instead of it, mandarin juice is added as much as the removed amount.

What % of the lemonade is lemon juice at the end?

A) 44 B) 48 C) 50 D) 52 E) 54

11. **x kilogram un ve y kilogram kakaodan oluşan bir karışımın ağırlıkça yüzde kaçı undur?**

x kg of flour and y kg of cocoa are mixed. What % of this mixture is flour?

A) $\frac{x+y}{100x}$ B) $\frac{x+y}{100y}$ C) $\frac{x+y}{100xy}$ D) $\frac{100x}{x+y}$ E) $\frac{100y}{x+y}$

12. x kilogram su ve y kilogram şekerden oluşan karışımın şeker oranı % z dir. Eğer bu karışımdan $\frac{2y}{3}$ kilogram su buharlaştırılırsa yeni karışımın şeker oranı % 2z olmaktadır.

Buna göre, $\frac{x}{y}$ oranı kaçtır?

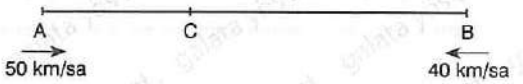
x kg of water and y kg of sugar are mixed and the sugar ratio of obtained mixture is z%. If $\frac{2y}{3}$ kg of water is evaporated from this mixture, the sugar ratio of new mixture becomes 2z%.

What is the ratio of $\frac{x}{y}$?

A) $\frac{3}{7}$ B) $\frac{4}{7}$ C) 1 D) 2 E) $\frac{1}{3}$

1-D 2-A 3-C 4-E 5-D 6-C 7-C 8-D 9-E 10-B 11-D 12-E

1.



A ve B noktalarındaki iki aracın hızları sırayla 50 km/sa ve 40 km/sa'tir.

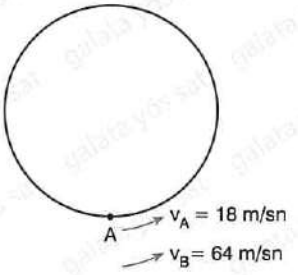
Bu iki araç aynı anda aynı noktadan yola çıkıp 3 saat sonra C noktasında karşılaştıklarına göre, |AB| yolu kaç km dir?

The velocities of two cars at points A and B are respectively 50 km/h and 40 km/h.

If these two cars meet in point C, 3 hours after they take off at the same time towards each other, how many km is the distance of |AB|?

A) 170 B) 200 C) 230 D) 270 E) 280

2.



Dairesel bir pist üzerindeki A noktasında hızları 18 m/sn ve 64 m/sn olan iki araç bulunmaktadır.

İki araç aynı anda aynı noktadan aynı yöne doğru hareket ettikten 15 saniye sonra ilk kez bir araya geldiklerine göre pistin çevresi kaç metredir?

There are two vehicles at point A on a circular track with velocities of 18 m/s and 64 m/s.

What is the circumference of the circular track if they meet for first time 15s after two vehicles take off from point A at the same time in the same direction?

A) 610 B) 630 C) 650 D) 670 E) 690

3.

İzmir'den Bursa'ya saatte 60 km hızla yola çıkan bir araç dönüşte hızını 90 km/sa te çıkararak bu şekilde İzmir'e ulaşmıştır.

Buna göre, bu aracın ortalama hızı kaç km/sa tir?

A vehicle travels from Izmir to Bursa with the velocity of 60 km/h and it returns to Izmir with the velocity of 90 km/h.

Accordingly, how many km/h is the average velocity of the vehicle?

A) 76 B) 74 C) 72 D) 70 E) 68

4. A şehrinden B şehrine yola çıkan bir aracın ilk hızı saatte 80 km dir. Her iki saatte hızını 40 km arttıran bu araç mola vermeden B şehrine 7 saatte ulaşmıştır.

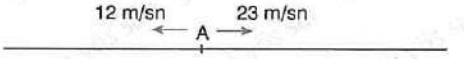
Buna göre, |AB| arası kaç kilometredir?

A car takes off from city A towards city B. Initial velocity of the car is 80 km/h but its velocity is increased by 40 km in every 2 hours. This car reaches city B in 7 hours.

What is the distance of |AB|?

A) 1220 B) 12000 C) 1120 D) 1020 E) 920

5.



A noktasında olan iki aracın hızları 12 m/sn ve 23 m/sn dir.

Bu iki araç aynı anda aynı noktadan zıt yönlerde hareket ettikten 3 dakika sonra aralarındaki mesafe kaç metre olur?

The velocities of two cars at point A are respectively 12 m/s and 23 m/s.

What will be the distance between them 3 minutes after the two cars start to move from point A at the same time in opposite directions?

A) 6100 B) 6300 C) 6500 D) 6600 E) 6900

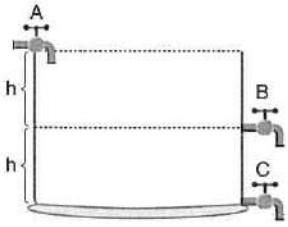
6. Bir kişinin kağıt üzerindeki maaşının % 40'ı sağlık sigortası, % 12'si vergi ve binde 8'i de işsizlik primi olarak kesilmektedir. Bu kişinin geriye kalan maaşına net maaş denmektedir.

Buna göre, bu kişinin net maaşının 4720 TL olması için kağıt üzerindeki maaşının kaç TL olması gerekir?
By his salary on papers, a man pays 40% of it for health insurance, 12% of it for taxes and 0,8 % of it for unemployment premium. The remaining part of his salary is called net salary.

Accordingly, how many TL should his salary on papers in order to have 4730 TL net salary?

A) 10^3 B) $2 . 10^3$ C) $5 . 10^3$ D) 10^4 E) $2 . 10^4$

7.



Şekildeki havuzu A musluğu tek başına 4 saatte doldurmaktadır. Havuzun dibindeki C musluğu ve havuzun yarı yüksekliğindeki B musluğu havuzun kendi seviyelerine kadarki kısmı tek başlarına 10 saatte boşaltabilmektedirler.

Yukarıda verilen şekle göre havuz tamamen kaç saatte dolar?
There are three faucets A, B and C shown in above figure. Whereas faucet A fills the pool alone in 4 hours, faucets B and C empty the same pool alone in 10 hours.

How many hours does it take for filling the pool if all faucets are opened?

A) 8 B) $\frac{25}{3}$ C) $\frac{26}{3}$ D) 9 E) 10

8. Boş bir havuzu tek başlarına 2, 4 ve 5 saatte dolduran 3 musluk aynı anda açıldıklarından 1 saat sonra boş havuzun kaçta kaçı dolmuş olur?

There are three faucets which fill an empty pool alone in 2, 4 and 5 hours.

What ratio of an empty pool becomes full 1 hour after all faucets are opened?

A) $\frac{4}{20}$ B) $\frac{5}{20}$ C) $\frac{9}{20}$ D) $\frac{19}{20}$ E) 1

9. Bir havuzu 5 saatte boşaltan ve 6 saatte dolduran iki musluk havuz dolu iken açılmıştır.

Buna göre, havuz kaç saatte boşaltılmış olur?
One faucet empties a pool in 5 hours. Another faucet fills it in 6 hours.

If both faucets are opened when the pool is full, how many hours does it take to empty it?

A) 3 B) 9 C) 18 D) 27 E) 30

10. Boş bir havuzu A musluğu doldururken B musluğu boşaltmaktadır. A musluğunun doldurma süresi B musluğunun boşaltma süresinden 3 saat daha kısadır.

A ve B muslukları birlikte havuzu 60 saatte doldurduklarına göre, A musluğu boş havuzun yarısını kaç saatte tek başına doldurabilir?
While faucet A fills a pool, faucet B empties it. Time required for faucet A to fill the pool is 3 hours shorter than time required for faucet B to empty it.

If they fill this pool together in 60 hours, how many hours does it take for faucet A to fill the half of pool alone?

A) 12 B) 9 C) 8 D) 7 E) 6

1-D 2-E 3-C 4-E 5-B 6-D 7-B 8-D 9-E 10-E

1. Bir dil kursunda 45 kız, 57 erkek öğrenci vardır.

Bu kurstan eşit sayıda kaç kız ve erkek öğrenci ayrılırsa geriye kalan kızların 3 katı, kalan erkeklerin 2 katı olur?

There are 45 female students and 57 male students in a language course.

How many male and female students should equally leave the course so that 2 times the number of remaining male students will be equal to 3 times the number of remaining female students?

A) 13 B) 16 C) 19 D) 21 E) 28

2. Bir labaratuvar ortamında her saat bir önceki saate göre 3 kat artan bir bakteri başlangıçta 5 tanedir.

Buna göre, 16 saat sonra labaratuvarda toplam kaç adet bakteri bulunur?

In a laboratory, the number of a bacterium is increased each hour by 3 times the previous hour.

If there are initially 5 bacteria in the laboratory how many bacteria will be 16 hours later?

A) $5 . 2^{16}$ B) $5 . 3^{15}$ C) $5 . 3^{16}$ D) $5 . 2^{30}$ E) $5 . 2^{32}$

3. Bir kasada toplam 78 kilo üzüm ve kiraz vardır. Kasadaki kiraz miktarı üzüm miktarının 12 katıdır.

Buna göre, kasada kaç kilogram üzüm vardır?

There are 78 kilos of grapes and cherries together. The amount of cherries is 12 times the amount of grapes.

Accordingly, how many kilos of grapes are there?

A) 6 B) 16 C) 24 D) 48 E) 72

4. Bir sınıfta öğrenciler sıralara 4'er 4'er otururlarsa 2 öğrenci ayakta kalmaktadır. Eğer öğrenciler sıralara 5'er 5'er otururlarsa da 2 sıra boş kalmaktadır.

Buna göre, bu sınıfta kaç adet sıra vardır?

In a classroom, 2 students are left standing if 4 students sit on each bench. 2 benches are left empty if 5 students sit on each bench.

Accordingly, how many benches are there in this classroom?

A) 8 B) 9 C) 12 D) 13 E) 15

5. Mehmet bir bilet kuyruğunda baştan 10. sırada, sondan 9. sıradadır. Nalan ise aynı kuyrukta sondan 6. sıradadır.

Buna göre, Nalan ile Mehmet arasında kaç kişi vardır?

In a ticket queue, Mehmet is 10 th from the head but the 9 th from the end.

Nalan is 6 th from the end of the same queue. How many people are there between them?

A) 0 B) 1 C) 2 D) 3 E) 4

6. Bülent bahçesinde 2 tavuk, 4 ördek ve 5 kedi besleyebiliyor. Ya da aynı bahçede 1 tavuk, 2 ördek ve 7 kedi besleyebiliyor.

Buna göre, Bülent bahçede kaç adet kedi besleyebilir?

Bülent can feed in his garden either 2 chickens, 4 ducks and 5 cats or 1 chicken, 2 ducks and 7 cats.

In this garden, how many cats can he feed?

A) 7 B) 8 C) 9 D) 10 E) 11

7. Bir kütüphanedeki kitapların $\frac{2}{11}$ i tarih kitabıdır.

Kütüphanedeki kitap sayısı 100'den fazla olduğuna göre, tarih kitabı en az kaç tanedir?

$\frac{2}{11}$ of all books in a library are history books. If there are more than 100 books in this library, at least how many books are history ones?

A) 18 B) 19 C) 20 D) 21 E) 22

8. Bir manavdaki elmalar çürüyerek $\frac{2}{7}$ oranında fire vermiştir.

Buna göre, maliyet ne oranda artmıştır?

Goods in a greengrocer have spoiled and reduced by $\frac{2}{7}$.

Accordingly, how much has its cost icreased as a result of this?

A) $\frac{1}{2}$ B) $\frac{1}{5}$ C) $\frac{2}{5}$ D) $\frac{5}{7}$ E) $\frac{6}{7}$

9. Bir top 10 metre yüksekten düşmüş ve yere her vurmasında ilk düştüğü yüksekliğin $\frac{1}{2}$ si kadar sıçramıştır.

Buna göre, top 4. çarpışına kadar düşey olarak kaç metre yol almıştır?

A ball is dropped from 10 m height. It bounces to $\frac{1}{2}$ of the height it fell from in each fall.

Accordingly, how many meters does this ball travel vertically until it bounces 4 th times?

A) 27,5 B) 25 C) 23,5 D) 21 E) 19,5

10. Bir araç A şehrinden B şehrine saatte 60 km hızla 4 saatte varmaktadır.

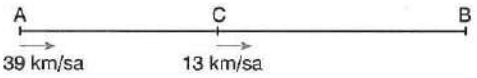
B şehrinden A şehrine 3 saatte geri dönmek zorunda kalan bu aracın hızı kaç km/sa dir?

A car travels with the velocity of 60 km/h from city A to city B in 4 hours.

How many km/h will the velocity of this car be to return from city B to city A in 3 hours?

A) 70 B) 80 C) 90 D) 95 E) 98

11.



Saatteki hızları 39 km ve 13 km olan iki araç sırayla A ve C noktalarından aynı anda B'ye doğru yola çıkıp aynı anda B'ye varmışlardır.

Buna göre, $\frac{|AB|}{|BC|} = ?$

Two vehicles take off at the same time from the points A and C respectively with the velocities of 39 km/h and 13 km/h towards the point B. They reach the point B at the same time.

Accordingly, what is the value of $\frac{|AB|}{|BC|} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

12. Bir işi Melike 24 günde yapabilmektedir. Melike kardeşi Firdevs'le aynı işi 8 günde bitirebilmektedir.

Buna göre, bu işi Firdevs tek başına kaç günde bitirebilir?

Melike finishes a job in 24 days. Melike and her sistor Firdevs finish this job together in 8 days.

Accordingly, how many days does it take for Firdevs to finish the job alone?

A) 10 B) 12 C) 14 D) 16 E) 18

1-D 2-E 3-A 4-C 5-C 6-C 7-C 8-C 9-A 10-B 11-C 12-B

1. Dakikadaki hızı 10 metre olan bir kayık 45 metrelik bir mesafeyi akıntıyla aynı yönde hareket ederse 3 dakikada katediyor.

Buna göre, kayık aynı mesafeyi akıntıya zıt yönde hareket ettiğinde kaç dakikada alır?
A boat with the velocity of 10 meters per minute covers 45 meters in 3 minutes if it travels in the same direction of the current.

Accordingly, how many minutes does it take for the boat to cover the same distance if it travels against the direction of the current?

A) 7 B) 8 C) 9 D) 6 E) 12

2. Saatteki hızları 12 ve 18 km olan iki bisikletliden hızlı olan bu parkurda 3. turunu tamamladığında yavaş olanın 3. turunu tamamlamasına 8 km kalmıştır.

Buna göre, yavaş olan bisikletli 1 turu kaç dakikada tamamlamıştır?
There are two bicyclists travelling with velocities of 12 km/h and 18 km/h. When the faster one finishes his 3rd tours, the slow one still has 8 km to finish his 3 rd tours.

Accordingly, how many minutes does it take for the slower bicyclist to finish 1 tour?

A) 30 B) 40 C) 50 D) 60 E) 70

3. Ali bir işin tamamını 12 günde, Süleyman ise aynı işin yarısını 12 günde bitirebilmektedir.

Buna göre, Ali ve Süleyman birlikte aynı işin iki katı bir işi kaç günde bitirebilirler?
While Ali finishes a job in 12 days, Suleyman finishes only a half of the same job in 12 days.

Accordingly, how many days are required for them to finish twice the job together?

A) 8 B) 12 C) 16 D) 18 E) 20

4. Biri diğerinin 3 katı hızla çalışan iki işçi bir işi birlikte 12 saatte tamamlamıştır.

Buna göre, hızlı olan işçi bu işi tek başına kaç saatte tamamlayabilir?
Two workers complete a job together in 12 hours. One worker is 3 times as fast as another.

Accordingly, how many days does it take for the faster worker to complete the job alone?

A) 16 B) 20 C) 28 D) 36 E) 48

5. **Eşit kapasiteli 3 işçinin 8 günde yapabileceği bir işi aynı kapasiteye sahip 4 işçi kaç günde bitirebilir?**
With the same capacity, how many days does it take for 4 workers to complete a job if 3 workers complete the job in 8 days?

A) 3 B) 4 C) 6 D) 7 E) 8

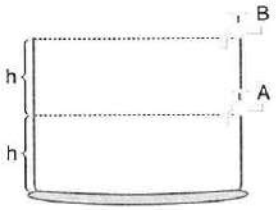
6. Bir havuzu tek başına 5 saatte ve 6 saatte dolduran iki musluk vardır. Havuzun dibinde de havuzu 3 saatte boşaltan başka bir musluk vardır.

Buna göre, bu üç musluk birlikte açıldığında aynı havuzun iki katı büyüklükteki bir havuzu kaç saatte doldurabilirler?
There are two faucets which fill an empty pool separately in 5 and 6 hours respectively. Another faucet at the bottom of the pool empties a full pool in 3 hours.

Accordingly, how many hours does it take for three faucets to fill a pool which is twice as large as this pool?

A) 30 B) 45 C) 50 D) 55 E) 60

7.



A ve B musluklarının havuzu tek başına doldurma süreleri 12 saattir.

Eğer bu musluklar şekildeki gibi yerleştirilirse boş havuzu kaç saatte doldurabilirler?

Faucets A and B can separately fill an empty pool in 12 hours.

If these faucets are located as shown in the figure, how many hours do they need to fill this pool together?

A) 24 B) 18 C) 12 D) 9 E) 6

8. Üç kişi belli bir işi sırayla tek başlarına x, y ve z günde bitirmektedir. Üçü birlikte aynı işi 8 günde bitirebilmektedir.

$x > y > z$ olduğuna göre, x aşağıdakilerden hangisi olabilir?

Three people can complete a job separately in x, y and z days. They can complete it in 8 days together.

If $x > y > z$ which of the following can be the value of x?

A) 21 B) 22 C) 23 D) 24 E) 25

9. Nalan bir işi 30 günde bitirmektedir.

Hızını % 40 oranında azaltan Nalan aynı işi bitirmek için kaç gün daha çalışmalıdır?

Nalan completes a job in 30 days. If Nalan decreases her capacity by 40%, how many extra days does she have to work to complete the same job?

A) 20 B) 30 C) 40 D) 50 E) 60

10. V hacimli bir havuzu dakikada x litre su akıtan bir musluk doldurmaktadır.

Buna göre, aynı musluğun 2V hacimli bir havuzun $\frac{2}{5}$'ini doldurma süresini veren bağıntı aşağıdakilerden hangisidir?

A faucet flowing x liters of water per minute fills a pool with the volume V.

Accordingly, what is correct equation of the necessary time for the same faucet to fill $\frac{2}{5}$ of a pool with the volume 2V?

A) $\frac{4V}{5x}$ B) $\frac{4x}{5V}$ C) $\frac{5V}{4x}$ D) $\frac{5x}{4V}$ E) $\frac{V}{5x}$

11. Boş bir havuzun $\frac{1}{3}$'ünü tek başına 2 saatte dolduran bir A musluğu ile aynı havuzun $\frac{1}{2}$'sini 6 saatte dolduran başka bir B musluğu birlikte açıldıklarında boş havuzun yarısı kaç saatte doldurabilirler?

Faucet A fills $\frac{1}{3}$ of an empty pool in 2 hours while faucet B fills $\frac{1}{2}$ of it in 6 hours. How many hours are required to fill the half of the empty pool if both faucets are opened together?

A) 2 B) 3 C) 4 D) 5 E) 6

12. Bir işi 10 usta 20 günde aynı işi 18 kalfa 30 günde yapabilmektedir.

Buna göre, 20 usta ve 54 kalfa birlikte aynı işi kaç günde tamamlayabilir?

A work can be completed by either 10 masters in 20 days or 18 apprentices in 30 days.

Accordingly, how many days does it take for 20 masters and 54 apprentices to complete the same work together?

A) 3 B) 4 C) 5 D) 6 E) 7

1-C 2-B 3-C 4-A 5-C 6-E 7-E 8-E 9-A 10-A 11-A 12-C

1. Bir havuzun % 12'si su ile doludur. Havuza 2 ton su ilave edildiğinde havuzun % 80'i boş kalmaktadır.

Buna göre, boş havuz alabileceği toplam su miktarı kaç tondur?

12% of a pool is full of water. If 2 tons of water is added to this pool, % 80 of it becomes empty.

Accordingly, how many tons of water is the capacity of the empty pool?

A) 20 B) 25 C) 35 D) 45 E) 60

2. Bir dikdörtgenin kısa kenarları % 30 azaltılmış, uzun kenarları % 60 arttırılmıştır.

Buna göre, dikdörtgenin alanında meydana gelen değişim için aşağıdakilerden hangisi doğrudur?

The shorter sides of a rectangle are decreased by 30%, while the longer sides of it are increased by 60%.

Accordingly, what change happens in the area of this rectangle?

A) % 10 azalmıştır (decreases)
B) % 10 artmıştır (increases)
C) % 70 azalmıştır (decreases)
D) % 12 azalmıştır (decreases)
E) % 12 artmıştır (increases)

3. **% 0,3'ü 0,06 olan sayının % 15'i kaçtır?**

If 0,3% of a number is 0,06, what is 15% of this number?

A) 15 B) 10 C) 5 D) 4 E) 3

4. **Yıllık % 15 bileşik faizle bankaya yatırılan 500 TL, 2 yıl sonra kaç TL olur?**

How much does 500 TL deposited in the bank with 15% annual compound interest rate become after 2 years?

A) 661,25 B) 661 C) 660 D) 659,25 E) 659

5. Yıllık % x basit faiz veren bir banka 3 yıl sonra ana paranın $\frac{3}{2}$ si kadar faiz vermektedir.

Buna göre, x kaçtır?

If some money deposited in a bank with x% annual simple interest rate brings interest as much as $\frac{3}{2}$ of initial capital after 3 years, what is the value of x?

A) 50 B) 48 C) 47 D) 46 E) 44

6. **Bir adam a lirasını yıllık % a basit faizle 2a aylığına bir bankaya yatırdığında elde ettiği faiz geliri 45 TL olduğuna göre, a kaçtır?**

If a man deposits his a TL for 2a months with a % annual simple interest rate, he gets 45 TL interest.

What is the value of a?

A) 27 B) 30 C) 33 D) 35 E) 38

7. Çekilerek uzatıldığında kopmadan boyunun % 140'ı kadar uzayan bir sakızın boyu çekildiğinde 1,8 cm olmaktadır.

Buna göre, sakızın çekilmeden önceki boyu kaç cm dir?
The length of a gum is 1,8 cm when it is extended by 140% by pulling.

Accordingly, how many cm is the length of a still gum?

A) 1,05 B) 0,85 C) 0,80 D) 0,75 E) 0,70

8. Her ay maaşının % 15'ini biriktiren bir kişinin 1 yıl sonunda 8100 TL'si olmuştur.

Buna göre, bu kişinin 1 aylık maaşı kaç TL'dir?
A man saves 15% of his salary and at the end of 1 year his saving is 8100 TL.

Accordingly, how many TL is his salary?

A) 4500 B) 4800 C) 5000 D) 5100 E) 5400

9. $F = \frac{A \cdot n \cdot t}{12 \cdot 100}$ **aylık basit faiz formülünde** $t > \frac{200}{n}$, $n \neq 0$ **olmak üzere aşağıdakilerden hangisi doğrudur?**

If the formula for simple interest rates per month is given by $F = \frac{A \cdot n \cdot t}{12 \cdot 100}$ where $t > \frac{200}{n}$, $n \neq 0$; which of following relations is correct?

A) $6 > \frac{F}{A}$ B) $6 > \frac{A}{F}$ C) $F > \frac{5}{A}$ D) $A > \frac{F}{5}$ E) $F \cdot A > 6$

10. Bir şirket 110 ton buğday ve mısır almıştır.

Buğdayın % 2'sini, mısırın da % 3'ünü satarak 2,4 tonluk bir satış gerçekleştiren bu şirketin aldığı buğday miktarı kaç tondur?
A company buys total 110 tons of wheat and corn. This company makes sales of 2,4 tons which contain only 2% of the wheat and 3% of the corn.

How many tons does the company buy wheat?

A) 20 B) 50 C) 70 D) 90 E) 120

11. Tanesini 60 TL'den 72 adet pantolon alan bir kişi 48 adet pantolonu kârlı olarak sattıktan sonra maliyeti karşılayabilmektedir.

Buna göre, bir pantolonun kârlı satış fiyatı kaç TL'dir?
A seller buys 72 pants each of which costs 60 TL. He covers all costs by selling only 48 pants with profited price.

Accordingly, how many TL is the profited price of pants?

A) 90 B) 88 C) 86 D) 84 E) 82

12. Bir kilo peynir x TL'dir.

Peynire % 30 zam yapıldığında x TL ye kaç gram peynir alınabilir?
The sale price of 1 kg of cheese is x TL, but there is 30% raise in its price.

How many kg of cheese can one buy for x TL with the new price?

A) $\frac{100}{13}$ B) $\frac{1000}{13}$ C) $\frac{10}{13}$ D) 100 E) 1000

1-B 2-E 3-E 4-A 5-A 6-B 7-D 8-A 9-B 10-D 11-A 12-C

1. Bir ürün a liraya satılırsa % 15 zarar, b liraya satılırsa % 15 kâr elde edilmektedir.

Buna göre, $\frac{a}{b}$ oranı kaçtır?

If a product is sold with a TL, 15% loss is made. If the product is sold with b TL, 15% profit is made.

Accordingly, what is the ratio of $\frac{a}{b}$?

A) $\frac{23}{17}$ B) 1 C) $\frac{17}{23}$ D) $\frac{15}{23}$ E) $\frac{17}{21}$

2. Tuz oranı % 37 olan x litre tuzlu su ile tuz oranı % 43 olan x litre tuzlu su karıştırılıyor.

Buna göre, oluşan yeni karışımın su yüzdesi kaçtır?

x liters of salty water with salt ratio of 37% and x liters of salty water with salt ratio of 43% are mixed.

Accordingly, what % is the water ratio of the obtained mixture?

A) 40 B) 45 C) 50 D) 55 E) 60

3. Şeker oranı % a olan 18 litre şekerli su ile şeker oranı % 21 olan a litre şekerli su karıştırılıyor.

Oluşan yeni karışımın şeker oranı % 12 ise a kaçtır?

18 liters of sugared water with sugar ratio of a % and a liters of sugared water with sugar ratio of 21% are mixed.

If the sugar ratio of obtained new mixture is 12%, what is a?

A) 7 B) 8 C) 9 D) 11 E) 12

4. **% 40'ı şeker olan 60 gram şekerli suyun 10 gramı buharlaştırılırsa kalan karışımın şeker oranı % kaç olur?**

What % will sugar rate of the mixture be after 10 grams of water is evaporated from 60 grams of sugared water with sugar rate 40%?

A) 42 B) 45 C) 48 D) 51 E) 54

5. % 5'i mineral olan bir gazoza, gazozun % 25'i kadar şeker ilavesi yapılıyor.

Buna göre, son durumda gazozun mineral oranı % kaçtır?

There is 5 % mineral in a soda. Sugar as much as its 25% is added to the soda.

Accordingly, what % is the mineral ratio of soda at the end?

A) 4 B) 5 C) 6 D) 7 E) 8

6. Tuz oranı % 16 olan x litre turşu suyu ile tuz oranı % 34 olan y litre turşu suyu karıştırılıyor.

Oluşan yeni karışımın tuz yüzdesi 20 ise $\frac{x}{y}$ oranı kaçtır?

x liters of pickle juice with salt ratio of 16% and y liters of pickle juice with salt ratio of 34% are mixed.

If the salt ratio of new mixture is 20%, what is the ratio of $\frac{x}{y}$?

A) $\frac{7}{2}$ B) $\frac{4}{3}$ C) 1 D) $\frac{3}{4}$ E) $\frac{2}{7}$

7. Tuz oranı % 14 olan 50 litre tuzlu suyun tuz oranını %40'a çıkarabilmek için karışımdan kaç litre su buharlaştırmak gerekir?

How many liters of water should be evaporated from 50 liters of salty water mixture with salt ratio of 14% in order to increase its salt ratio to 40%?

A) 32 B) 32,5 C) 38 D) 40 E) 41

8. Yüzde 2'si yağ olan 100 ml süt ile yüzde 3'ü yağ olan 400 ml süt karıştırılıp yoğurt yapılmıştır.

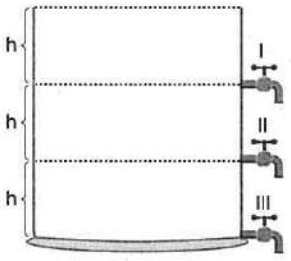
Buna göre, yoğurdun yağ oranı % kaçtır?

100 ml of milk with 2% of fat and 400 ml of milk with 3% of fat are mixed to make yoghurt.

Accordingly, what percent is the fat ratio of yogurt?

A) 2.7 B) 2.8 C) 2.9 D) 3 E) 3.1

9.



Yerden eşit yükseklikteki noktalara konan özdeş I, II ve III numaralı musluklar havuz tamamen dolu iken havuzu 33 saatte boşaltmaktadırlar.

Buna göre, herhangi bir musluğun havuzun tamamını tek başına boşaltma süresi kaç saattir?

Three identical faucets I, II and III are located in places shown in figure. If they are opened together, they can empty a full pool in 33 hours.

Accordingly, how many hours does it take for any single faucet to empty this pool?

A) 18 B) 24 C) 36 D) 48 E) 54

10. 50 gram un ve 2 gram karbonattan oluşan bir karışımın 1 gramından kaç gram karbonat vardır?

How many grams of carbonate is there in 1 gram of a mixture which consists of 50 grams of flour and 2 grams of carbonate?

A) $\frac{1}{25}$ B) $\frac{1}{26}$ C) $\frac{1}{38}$ D) $\frac{1}{52}$ E) $\frac{25}{26}$

11. Kendi başına boş bir havuzu 4 saatte dolduran bir A musluğu ve 6 saatte boşaltan başka bir B musluğu vardır.

B musluğu havuzun yerden itibaren kaçta kaçı yüksekliğe konursa havuz baştan itibaren toplam 8 saatte dolar?

There is a faucet A that can fill an empty pool in 4 hours alone. There is another faucet B which can empty a full pool in 6 hours alone.

At what ratio of height from the ground should faucet B be located so that these two faucets can fill the empty pool in 8 hours?

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

12. x liranın yıllık % a basit faizle 4 yılda kazandıracağı basit faiz, y liranın yıllık % b basit faizle 5 yılda kazandıracağı basit faize eşittir.

2x = 5y olduğuna göre, a ve b arasındaki bağıntı aşağıdakilerden hangisinde doğru olarak verilmiştir?

Interests gained by x TL for 4 years with a % annual simple interest rates and by y TL for 5 years with b % annual simple interest rates are equal.

If 2x = 5y, what is the relation between a and b?

A) b = 2a B) a = 2b C) a = 4b D) 4a = 5b E) b = 3a

1-C 2-E 3-B 4-C 5-A 6-A 7-B 8-B 9-E 10-B 11-E 12-A

Deneme / Practice Test

1. $\dfrac{\left(\frac{3}{7}-\frac{11}{18}-\frac{4}{19}\right)-\left(\frac{17}{7}+\frac{7}{18}+\frac{34}{19}\right)}{1-\frac{1}{2}-\frac{1}{3}}=?$

A) -5 B) -12 C) -15 D) -18 E) -30

2. $\dfrac{1,7}{2,04}-0,5+\dfrac{2,1}{0,18}=?$

A) $\frac{1}{12}$ B) $\frac{1}{3}$ C) 3 D) 12 E) 14

3. $0,3-\dfrac{1}{0,4-\frac{1}{0,5}}=?$

A) 1,025 B) 1 C) 0,975 D) 0,950 E) 0,925

4. $\dfrac{0,11\,.\,10^{-3}+400\,.\,10^{-7}}{0,2\,.\,10^{-4}+30\,.\,10^{-6}}=?$

A) 3 B) 0,3 C) 0,03 D) 0,015 E) 0,005

5. $(-a^3)^{-3}\,.\,(-3a)^4\,.\,(3a^2)^{-4}\,.\,(a^{-4})^{-2}=?$

A) $+a^5$ B) $-a^5$ C) $-a^{-5}$ D) a^{-5} E) $5a^5$

6. $5^x=2^y$

$\Rightarrow 4^{\frac{y}{x}}+125^{\frac{x}{y}}=?$

A) 133 B) 129 C) 33 D) 13 E) 7

7. $\dfrac{(5\sqrt{3})^2-(3\sqrt{5})^2}{5^{\frac{3}{2}}+5^{\frac{1}{2}}}=?$

A) $\frac{1}{5}$ B) $\frac{1}{\sqrt{5}}$ C) $\sqrt{5}$ D) 5 E) $5\sqrt{5}$

8. $3\sqrt{\frac{1}{3}}+12\sqrt{\frac{1}{12}}-27\sqrt{\frac{1}{27}}=?$

A) $6\sqrt{3}$ B) $\sqrt{3}$ C) $3\sqrt{3}$ D) 0 E) $-\sqrt{3}$

9. $x \neq 3,\ x \neq 2$

$$4 + \frac{3}{2 + \frac{x}{x-3}} = 2$$

$\Rightarrow$ **x = ?**

A) $\frac{7}{3}$ B) $\frac{8}{3}$ C) 3 D) $\frac{10}{3}$ E) $\frac{11}{3}$

10. $\frac{6x^2 + 5x - 6}{2x^2 - x - 6} : \frac{3x^2 - 5x + 2}{x^2 + x - 2} = ?$

A) $\frac{x-2}{x+2}$ B) $\frac{x+2}{x-2}$ C) $\frac{2x+3}{x-2}$ D) $\frac{x+3}{2x+2}$ E) $\frac{x-3}{2x+1}$

11. $\frac{x^2 + x + 1}{x^2 - 4} \cdot \frac{x+2}{x^3 - 1} + \frac{x-3}{x^2 - 3x + 2} = ?$

A) $\frac{x-1}{x-2}$ B) $\frac{x-3}{x-2}$ C) $\frac{1}{x-1}$ D) $\frac{1}{x-2}$ E) $\frac{1}{x-3}$

12. $ax = by = cz = 4,\quad a + 2b + 3c = m$

$$\frac{1}{x} + \frac{2}{y} + \frac{3}{z} = 3$$

$\Rightarrow$ **m = ?**

A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) 8 D) 12 E) 14

13. $\frac{n+m}{2m+3n} = 7$

$\frac{n+2m}{2m+3n} = x$

$\Rightarrow$ **x = ?**

A) 26 B) 27 C) 30 D) 52 E) 54

14. $m, k \in Z^+$

$A = 4! + 5! + 6! + \ldots + 13!$

$B = 5! + 6! + 7! + \ldots + 14!$

$B - A = 9m + k$

$\Rightarrow$ **min(k) = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

15. $a \otimes b = \begin{cases} \frac{a}{b}, & a \geq b \\ a \cdot b, & a < b \end{cases}$

$\otimes$ işleminin etkisiz elemanı kaçtır?
What is the identity element of the operation $\otimes$?

A) 0 B) 1 C) 2 D) 4 E) 6

16. $m \in Z^+,$

$2^m \equiv x \pmod 5$

$\Rightarrow$ **x = ?**

A) $\{0, 1, 2, 3, 4\}$ B) $\{1, 2, 3, 4\}$ C) $\{0, 1, 2\}$ D) $\{1, 2, 3\}$ E) $\{2, 3, 4\}$

17. $\left.\begin{array}{l} a \equiv 3 \pmod 7 \\ b \equiv 4 \pmod 7 \end{array}\right\} \Rightarrow 7a + 5b - 13 \equiv x \pmod 7$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

18. $a > 7 > b$

$\Rightarrow$ $|a - 4| + |b - 8| - |a - b| = ?$

A) $2a - 2b + 4$ B) $2a + 2b - 12$ C) $-2a + 2b - 4$ D) 4 E) -4

19. $A \not\subset B$, $B \not\subset A$, $n(A \cap B) = 3$, $n(B - A) = 4$

$\Rightarrow$ $\min[n(A)] = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

20. f(x) doğrusal fonksiyon olmak üzere,

f(x) is a leaner function

$f(x + 2) + f(x - 3) = 4x + 6$

$\Rightarrow$ **f(3) = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

21. $f(2x) + f(x + 4) = x + 2$

$\Rightarrow$ **f(6) − f(0) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

22. $f(x) = 5^{3x}$

$\Rightarrow$ $\dfrac{f(3x + 1)}{f(2x + 1)}$ **in f(x) türünden değeri nedir?**

What is f(x) in terms of $\dfrac{f(3x + 1)}{f(2x + 1)}$?

A) f(x) B) 5 f(x) C) $[f(x)]^2$ D) $[f(x)]^3$ E) $5\,[f(x)]^3$

23. Bir öğrenci parasıyla 3 simit ve 2 içecek veya 2 simit ve 5 içecek alabilmektedir.

Buna göre, bu öğrenci parasının tamamıyla kaç adet içecek alabilir?

A student can buy either 3 bagels and 2 beverager or 2 bagels and 5 beverages.

Accordingly, how many beverages can this student buy with the same amount of money?

A) 9 B) 10 C) 11 D) 12 E) 13

24. Nalan doğum günü pastasının $\frac{1}{6}$ sını yedikten sonra kalanını 15 arkadaşına eşit olarak paylaştırmıştır.

Buna göre, Nalan'ın yediği pasta miktarı herhangi bir arkadaşının yediği miktarın kaç katıdır?

After nalan ate $\frac{1}{6}$ of her brithday cake, the shares the remaining par with 15 friends of her.

Accordingly, how many timesi is the amount of the cake she ate?

A) $\frac{1}{15}$ B) $\frac{1}{6}$ C) $\frac{1}{3}$ D) 3 E) 6

25. Nihal ve Faruk'un yaşları toplamı Didem'in yaşına eşittir.

8 yıl sonra Nihal ve Faruk'un yaşları toplamı Didem'in yaşının $\frac{3}{2}$ katı olduğuna göre, Didem'in bugünkü yaşı kaçtır?

The sum of the age of Nihal and Faruk is equal to the age of Didem.

If after 8 years, the total age of Nihal and Faruk is $\frac{3}{2}$ times the age of Didem. What is the age of Didem today?

A) 8 B) 12 C) 16 D) 20 E) 24

26. $a = \frac{1}{2}$ $b = \frac{1}{3}$ $c = \frac{1}{4}$

$\Rightarrow \left|\,|b - a| + |a - c| + |b|\,\right| = ?$

A) $\frac{1}{4}$ B) $\frac{3}{4}$ C) 1 D) $\frac{5}{3}$ E) 2

27. Bir havuzu 18 saatte dolduran ve 36 saatte boşaltan iki musluk, havuz boşken birlikte açılıyor ve havuz yarısına kadar dolduğunda boşaltan musluk kapatılıyor.

Buna göre, havuz toplam kaç saatte dolmuş olur?

Two taps that fill a pool in 18 hours and drain in 36 hours are opened together when the pool is empty, and when the pool is filled until halfway the tap that drains is closed.

Accordingly, how many hours will the pool be filled in total?

A) 36 B) 30 C) 27 D) 24 E) 18

28. $x > 4$,

$2x^4 + 2x^2 + x + 3 = (A)_x$

$\Rightarrow$ **A = ?**

A) (4213) B) (20213) C) (2213) D) (20203) E) (20113)

29. $ABC = 21 \,.\, BC$

$A = B + C$

$\Rightarrow$ **ABC = ?**

A) 624 B) 752 C) 835 D) 853 E) 945

30. $\frac{x + 4y}{x \,.\, y} = \frac{2y + z}{y \,.\, z} = \frac{3x + 4z}{x \,.\, z} = \frac{1}{3}$

$\Rightarrow \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = ?$

A) 1 B) $\frac{1}{3}$ C) $\frac{3}{10}$ D) $\frac{1}{6}$ E) $\frac{4}{7}$

1-E	2-D	3-E	4-A	5-C	6-C	7-C	8-D	9-A	10-B	11-C	12-D	13-B	14-E	15-B	16-B
17-A	18-D	19-B	20-D	21-C	22-A	23-C	24-D	25-A	26-B	27-C	28-B	29-E	30-C		

1. $\frac{1}{56}+\frac{1}{90}-\frac{1}{7}+\frac{1}{8}-\frac{1}{9}=?$

A) $\frac{1}{6}$ B) $\frac{1}{9}$ C) $\frac{1}{10}$ D) 0 E) $-\frac{1}{10}$

2. $\dfrac{2020\frac{1}{2}-2019\frac{1}{3}}{2018\frac{1}{3}-2017\frac{3}{4}}=?$

A) 2 B) $\frac{1}{2}$ C) $\frac{2}{7}$ D) $\frac{1}{7}$ E) $\frac{1}{9}$

3. $\dfrac{(0{,}1+0{,}01+0{,}001)\,.\,(0{,}2+0{,}02+0{,}002)}{(0{,}3+0{,}03+0{,}003)\,.\,(0{,}4+0{,}04+0{,}004)}=?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{6}$ E) $\frac{1}{7}$

4. $2^{x+3}=7$

$\Rightarrow 49^{\frac{1}{x+3}}=?$

A) 2 B) 4 C) 7 D) 8 E) 14

5. $\left.\begin{array}{l} a^3\,.\,b^4=2^4 \\ a^7\,.\,b^6=2^6 \end{array}\right\} \Rightarrow a\,.\,b=?$

A) 10 B) 8 C) 6 D) 4 E) 2

6. $\left.\begin{array}{l} 25^x=81 \\ 27=5^{y+1} \end{array}\right\} \Rightarrow 3x-2y=?$

A) 3 B) 2 C) 1 D) −1 E) −2

7. $\sqrt{\sqrt{x}}+\sqrt[4]{\sqrt{x}}=6$

$\Rightarrow x=?$

A) 32 B) 64 C) 128 D) 256 E) 512

8. $A=\sqrt{x+1}-\sqrt{x-3}$

$\Rightarrow \sqrt{x+1}+\sqrt{x-3}=?$

A) $-A$ B) $-\frac{4}{A}$ C) $\frac{4}{A}$ D) A E) $4A$

9. $\frac{3}{a} + \frac{a+4}{a+1} + \frac{a-3}{a} = \frac{1}{2}$

$\Rightarrow$ **a = ?**

A) −1 B) −2 C) −3 D) −4 E) −5

10. $a + b = 3$

$b + c = 7$

$c - d = 2$

$\Rightarrow$ **a − 2c + d = ?**

A) 6 B) 5 C) −2 D) −6 E) −7

11. $a > 0,$

$\frac{a(a-1)}{a^2+1} \cdot \frac{a^4-1}{a^2-a} = 8$

$\Rightarrow$ **a = ?**

A) 5 B) 4 C) 3 D) 2 E) $\frac{1}{2}$

12. $\frac{a-b}{c} = \frac{2}{3}$

$\frac{b-c}{a} = \frac{1}{4}$

$b + c = 46$

$\Rightarrow$ **a = ?**

A) 5 B) 10 C) 20 D) 30 E) 40

13. $a = b + 1 = c + 2$

$a \,.\, b \,.\, c = 40(a + b + c)$

$\Rightarrow$ **a + b + c = ?**

A) 33 B) 32 C) 22 D) 21 E) 20

14. $13! \,.\, 25 = a$

$\Rightarrow$ **13! + 14! + 15! = ?**

A) 25a B) 15a C) 9a D) 5a E) 3a

15. $a, b \in A,$

$A = \{-2, -1, 0, 1, 2\}$

a ★ b = "a ile b'den büyük olmayan" işleminin etkisiz elemanı kaçtır?

a ★ b = what is the identity element of the operation "not bigger than a and b"?

A) −2 B) −1 C) 0 D) 1 E) 2

16. $a, b \in Z,$

$$a \odot b = \begin{cases} a + b, & a > b \\ b \,.\, a, & b \geq a \end{cases}$$

$\Rightarrow$ **(2 ⊙ 3) ⊙ (3 ⊙ 2) = ?**

A) 10 B) 11 C) 25 D) 36 E) 38

17. $a > 1$

$a^3 + 4a + 12 \equiv 0 \pmod{a}$

$\Rightarrow$ **max(a) = ?**

A) 12 B) 6 C) 4 D) 3 E) 2

18. $|a^2 - 25| - |a - 5| = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{0, 5\}$ B) $\{-5, 0\}$ C) $\{-5, 0, 5\}$

D) $\{-6, -4, 5\}$ E) $\{-6, -5, -4\}$

19. $2^{121} \equiv x \pmod{13}$

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 6 D) 8 E) 11

20. $fog(x) = x^2 - x - 7$

$f(x + 1) = 2x + 15$

$\Rightarrow$ **g(5) = ?**

A) −5 B) −3 C) 0 D) 1 E) 3

21. $f\left(\dfrac{mx + n}{nx + m}\right) = 1 + x + x^2 + \ldots x^{101}$

$\Rightarrow$ **f(1) = ?**

A) 100 B) 101 C) 102 D) 103 E) 104

22. $g(5) = 1$

$f(x) = x^2 + 4x + m$

$fog(x) = 7$

$\Rightarrow$ **m = ?**

A) 2 B) 1 C) 0 D) −1 E) −2

23. $a \cdot m = b \cdot n = c \cdot p = 4$

$2m + 3n - 5p = 1$

$\dfrac{2}{a} + \dfrac{3}{b} = 2$

$\Rightarrow$ **c = ?**

A) $\dfrac{7}{20}$ B) $\dfrac{7}{17}$ C) $\dfrac{7}{2}$ D) $\dfrac{20}{7}$ E) 7

24. $||a+2|-3| = 2$

$\Rightarrow$ $\Sigma a = ?$

A) −11 B) −8 C) −7 D) −6 E) −3

25. Herkesin en çok iki dil konuştuğu bir sınıfta almanca ve ingilizce konuşan 3 kişi, almanca ve fransızca konuşan 5 kişi, ingilizce ve fransızca konuşan 7 kişi vardır. Sadece herhangi bir dil konuşanlar o dili konuşanların yarısıdır.

Bu sınıfta hiç dil bilmeyen olmadığına göre, sınıf mevcudu kaçtır?

"In a classroom where everyone speaks two languages at most, there are 3 people who speak German and English, 5 people who speak German and Fench and 7 people who speak English and French. Only those who speak any language are half the speakers of that language.

Since there is no one who just speaks one language in In this class, how many students are there in the classroom?"

A) 10 B) 15 C) 30 D) 40 E) 45

26. $n(A \cap B) = n(A - B) = 2n(B - A)$

$n(A \cup B) = 15$

$\Rightarrow$ **n(A) = ?**

A) 3 B) 6 C) 9 D) 12 E) 14

27. $A \times B = \{(a, a), (a, b), (b, a), (b, b), (c, a), (c, b)\}$

$\Rightarrow$ **A \ B = ?**

A) $\{a\}$ B) $\{b\}$ C) $\{c\}$ D) $\{a, b\}$ E) $\{a, c\}$

28. 18 makine tam kapasite çalışarak bir siparişi 12 günde tamamlamaktadır.

Buna göre, aynı makinelerin kapasitesi % 40 oranında azaltılırsa aynı sipariş kaç günde biter?

18 machines work at full capacity, completing an order in 12 days.

Accordingly, if the capacity of the same machines is reduced by 40%, how many days will the same order expire?

A) 18 B) 20 C) 22 D) 24 E) 26

29. Basit faizle bankaya yatırılan bir miktar paraya yıllık %4 faiz uygulanmıştır.

t ay sonra yatırılan paranın $\frac{1}{25}$ i kadar faiz elde edildiğine göre, t kaçtır?

4% Interest per year was applied to some money deposited in the bank with simple interest.

Since $\frac{1}{25}$ of the money deposited after t month interest is obtained, what is t?

A) 10 B) 12 C) 14 D) 16 E) 18

30. % 5 asit oranına sahip 100 litre zeytinyağı ile % 8 asit oranına sahip 200 litre zeytinyağı karıştırılmıştır.

Buna göre, oluşan yeni karışımın asit oranı yüzde kaçtır?

"100 Liters of olive oil with 5% acid ratio and 200 liters of olive oil with an 8% acid ratio was mixed.

Accordingly, what is the acid ratio of the new mixture formed?"

A) 5,2 B) 6 C) 7 D) 8,3 E) 9

1-E	2-A	3-D	4-B	5-E	6-B	7-D	8-C	9-C	10-D	11-C	12-E	13-A	14-C	15-E	16-B
17-A	18-D	19-B	20-C	21-C	22-A	23-D	24-B	25-E	26-D	27-C	28-B	29-B	30-C		

1. $\underbrace{\frac{1}{2}-\frac{2}{3}+\frac{1}{2}-\frac{2}{3}+\frac{1}{2}+\ldots\frac{1}{2}}_{(n-1)\text{ tane terim}}=-1$

$\Rightarrow$ **n = ?**

A) 20 B) 17 C) 15 D) 13 E) 11

2. $1,\overline{1}+2,\overline{2}+3,\overline{3}+4,\overline{4}+\ldots+9,\overline{9}=?$

A) 45 B) 47 C) 49 D) 50 E) 52

3. $2+\cfrac{3}{2+\cfrac{3}{2+\cfrac{3}{2+\cfrac{3}{\vdots}}}}=?$

A) 3 B) 2 C) 1 D) 0 E) −1

4. $2^{0,1}\cdot 2^{0,2}\cdot 2^{0,3}\cdot\ldots\cdot 2^{0,9}=?$

A) 2 B) 8 C) 16 D) $16\sqrt{2}$ E) $20\sqrt{2}$

5. $16\,.\,25\,.\,27=3^a\,.\,2^b\,.\,5^c$

$\Rightarrow$ **b + c − a = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

6. $(3-a)^4=16$

$\Rightarrow$ $\Sigma a=?$

A) 1 B) 3 C) 5 D) 6 E) 8

7. $\frac{1}{2+\sqrt{3}}+\frac{4}{\sqrt{7}-\sqrt{3}}-\frac{7}{\sqrt{7}}=?$

A) $2+\sqrt{7}$ B) $\sqrt{3}-\sqrt{7}$ C) 2 D) $2\sqrt{3}-2\sqrt{7}$ E) $2+\sqrt{7}+2\sqrt{3}$

8. $2-\frac{11}{2-\frac{1}{\sqrt{3}}}+3+\frac{26}{3-\frac{1}{\sqrt{3}}}=?$

A) $5\sqrt{3}$ B) $3\sqrt{3}$ C) 8 D) $2\sqrt{3}$ E) $-3\sqrt{3}$

9. $2m + 3p = 3n$

$n + p = m$

$\Rightarrow \frac{n}{p} = ?$

A) 7 B) 5 C) 3 D) $\frac{1}{3}$ E) $\frac{1}{5}$

10. $\frac{2m^2 - mn - 3n^2}{2m + 2n} + \frac{2m^2 + mn - 3n^2}{2m - 2n} = ?$

A) 4m B) 3m C) 2m D) 3n E) 6n

11. $(1 - x) . (1 + x^2) = \frac{-63}{x + 1}$

$\Rightarrow x = ?$

A) $2\sqrt{2}$ B) $2\sqrt{3}$ C) 16 D) $4\sqrt{2}$ E) $5\sqrt{2}$

12. $\frac{a + b}{2a + 3b} = \frac{x}{y}$

$\Rightarrow \frac{x - y}{2x - y} = ?$

A) $\frac{2a + b}{b}$ B) $\frac{2a + 2b}{a - b}$ C) $\frac{a - 2b}{a}$ D) $\frac{a - 2b}{b}$ E) $\frac{a + 2b}{b}$

13. $\frac{a}{b} = \frac{c}{d} = k$

$\frac{3a + 4n}{3b + d} = k$

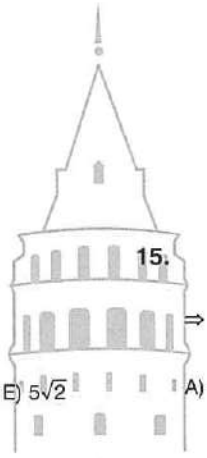
$\Rightarrow n = ?$

A) 4c B) 2c C) c D) $\frac{c}{2}$ E) $\frac{c}{4}$

14. $a! = 2$

$\Rightarrow (a + 1)! + (a + 2)! = ?$

A) 2 B) 3 C) 8 D) 30 E) 144



15. $a \square b = a . b + a + b$

$\Rightarrow 5^{-1} = ?$

A) $-\frac{6}{5}$ B) $-\frac{5}{6}$ C) 0 D) $\frac{5}{6}$ E) $\frac{6}{5}$

16. $n > 5,$

$n! + (n - 1)! + \ldots + 1! + 0! \equiv x \pmod 5$

$\Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

17. $(123)_4 + (302)_4 = (A)_5$

$\Rightarrow$ **A = ?**

A) 300 B) 301 C) 302 D) 303 E) 304

18.

$$\begin{array}{r|l} A & B \\ \hline & 4 \\ - & \\ \hline 7 & \end{array} \qquad \begin{array}{r|l} B & C \\ \hline & 3 \\ - & \\ \hline 2 & \end{array}$$

$\Rightarrow$ **min(A) = ?**

A) 49 B) 50 C) 51 D) 52 E) 53

19. $f(x) = \begin{cases} x, & x \equiv 0 \pmod 3 \\ x-1, & x \equiv 1 \pmod 3 \\ x-2, & x \equiv 2 \pmod 3 \end{cases}$

$f(10) + f(11) + f(a) = 27$

$\Rightarrow$ **min(a) = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

20. $f(x) = x^2 + x$

$\Rightarrow$ **f(x + 1) − f(x) = ?**

A) $2x + 2$ B) $2x - 1$ C) $x^2 + 2x$ D) $x^2 - 2x$ E) $x + 1$

21. $fog(x) = x^2 + 2$

$f(x) = 2x - 3$

$\Rightarrow$ **g(x) = ?**

A) $\frac{x+2}{5}$ B) $\frac{x+5}{2}$ C) $2x^2 + 5$ D) $\frac{x^2+2}{5}$ E) $\frac{x^2+5}{2}$

22. f: birim fonksiyon (f: identity function)

g: sabit fonksiyon (g: constant function)

$fog(x) + gof(x) = 22$

$\Rightarrow$ **g(8) = ?**

A) 8 B) 9 C) 11 D) 16 E) 22

23. $A \subset E$ ve $B \subset E$

$s(A) + s(B') = 19$

$s(B) + s(A') = 21$

$\Rightarrow$ **s(E) = ?**

A) 19 B) 20 C) 21 D) 22 E) 23

24. $n[(A \times B) \cap (A \times C)] = 30$

$n(A) = 6$

$\Rightarrow$ **$n(B \cap C) = ?$**

A) 5 B) 6 C) 7 D) 10 E) 15

25. $|a - 3| = 103!$

$\Rightarrow$ **$\Sigma a = ?$**

A) 6 B) 36 C) 103 D) 103! E) 103! + 3

26.

$$\begin{array}{r} ab \\ \times \quad cd \\ \hline 166 \\ + \quad \bullet 3 \\ \hline mnp \end{array}$$

$\Rightarrow$ **$m + n + p = ?$**

A) 30 B) 27 C) 24 D) 21 E) 18

27. $|a - 4| + |8 - 2a| = 15$

$\Rightarrow$ **$\max(a) = ?$**

A) −1 B) 0 C) 1 D) 9 E) 10

28. $a, b, c \in Z^+$

$a \cdot b \cdot c = 18$

ise kaç farklı (a + b + c) toplamı bulanabilir?
How many different (a + b + c) totals can be found?

A) 2 B) 3 C) 4 D) 5 E) 6

29. Yaşları toplamı 18 olan iki kardeşten büyük olan küçük kardeşin yaşındayken küçük kardeş 3 yaşındaydı.

Buna göre, büyük kardeş bugün kaç yaşındadır?
The sum of ages of two siblings is 18. When the older sibling was the same age as the smaller one, the smaller one was 3 years old.
Accordingly, how old is the older sibling today?

A) 12 B) 11 C) 9 D) 8 E) 7

30. % 25 karla satılan bir ürünün fiyatı 150 TL dir.

Buna göre, bu ürünün % 20 zararlı satış fiyatı kaç TL dir?
The price of a product sold with 25% profit is 150 tl.
Accordingly, what is the 20% loss price of this product?

A) 88 B) 90 C) 92 D) 94 E) 96

1-A	2-D	3-A	4-D	5-B	6-D	7-C	8-C	9-B	10-C	11-A	12-E	13-E	14-D	15-B	16-E
17-C	18-C	19-D	20-A	21-E	22-C	23-B	24-A	25-A	26-C	27-D	28-C	29-B	30-E		

1. $A = \frac{3}{19} + \frac{4}{41} + \frac{6}{31}$

$B = \frac{35}{19} + \frac{119}{41} - \frac{37}{31}$

$\Rightarrow$ **A = ?**

A) 4 – B B) 4 + B C) 5 – B D) B – 5 E) B + 5

2. $\frac{4}{1 - \frac{1}{4}} - 4 - \frac{\frac{1}{4}}{4} = ?$

A) $-\frac{61}{48}$ B) $-\frac{37}{48}$ C) $-\frac{5}{48}$ D) $\frac{61}{48}$ E) $\frac{73}{24}$

3. $\dfrac{\frac{6,3}{0,21} - \frac{0,69}{0,23}}{\frac{1,3}{0,52}} = ?$

A) 10 B) 10,2 C) 10,4 D) 10,6 E) 10,8

4. $a \neq 0,\ b \neq 0,\ c \neq 0$

$(abc) = 9(ab) + 12$

$\Rightarrow$ **a + b + c = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

5. $5^a = 81$

$3^b = 125$

$\Rightarrow$ **a . b = ?**

A) 30 B) 20 C) 12 D) 6 E) 2

6. $\left(\frac{119}{41}\right)^{x-3} = 25^{3-x}$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

7. $\frac{2^{m+n}}{81^{m-n}} = 6^4 . 2$

$\Rightarrow$ **m = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

8. $\frac{\sqrt[3]{3\sqrt[4]{3}}}{\sqrt[6]{9\sqrt{3}}} = ?$

A) $3\sqrt{3}$ B) $\sqrt{3}$ C) 1 D) $\frac{1}{\sqrt{3}}$ E) $\frac{1}{3\sqrt{3}}$

9. $x\sqrt[3]{x\sqrt{x\sqrt{x}}} = ?$

A) $\sqrt[19]{x^{12}}$ B) $\sqrt[12]{x^{19}}$ C) $\sqrt[4]{x^3}$ D) $\sqrt[3]{x^4}$ E) $\sqrt[12]{x^{11}}$

10. $\dfrac{x^3+1}{x^2-4} : \left(1 + \dfrac{1}{x^2} - \dfrac{1}{x}\right) \cdot \dfrac{x-2}{x^2+x} = ?$

A) $\dfrac{x+1}{x}$ B) $\dfrac{x-2}{x}$ C) $\dfrac{x}{x+2}$ D) $\dfrac{x}{x-2}$ E) $\dfrac{x-1}{x+2}$

11. $a = 100$

$b = 199$

$\Rightarrow$ $16a^4 - 32a^3b + 24a^2b^2 - 8ab^3 + b^4 = ?$

A) 1 B) 16 C) 32 D) 10^4 E) 99^4

12. $\dfrac{(x+3y)^2 - 12xy}{x^2 - 2xy - 3y^2} = ?$

A) $\dfrac{3x+y}{x+3y}$ B) $\dfrac{x-3y}{x}$ C) $\dfrac{x+3y}{x-y}$ D) $\dfrac{x+3y}{x+y}$ E) $\dfrac{x-3y}{x+y}$

13. $\dfrac{z}{y+4} = \dfrac{y+2}{x-2} = \dfrac{x-4}{z+3} = \dfrac{4}{5}$

$\Rightarrow$ $x + y + z = ?$

A) 10 B) 20 C) 30 D) 35 E) 40

14. $a + \dfrac{3}{b} = 7$

$b + \dfrac{3}{a} = 14$

$\Rightarrow$ $\dfrac{2b+a}{a} = ?$

A) 21 B) 14 C) 10 D) 5 E) 2

15. $0{,}48x + 0{,}7 = 0{,}3x - 1{,}1$

$\Rightarrow$ $x = ?$

A) 20 B) 10 C) 0 D) -10 E) -20

16. $\dfrac{1 - \dfrac{1}{x}}{\dfrac{3}{x}} = \dfrac{4}{3}$

$\Rightarrow$ $x = ?$

A) 6 B) 5 C) 3 D) $\dfrac{1}{3}$ E) $\dfrac{1}{5}$

17. $x < y < 0$

$\Rightarrow$ $|x| + |x+y| + |x-y| = ?$

A) $3x$ B) $2y$ C) $3x - 2y$ D) $-2y$ E) $-3x$

18. $|x| + 2|y| = 3|x|$

$3x + y = 35$

$\Rightarrow$ **max(x) = ?**

A) $\frac{35}{2}$ B) 14 C) $\frac{35}{4}$ D) 7 E) 5

19. $A = \{1, 2, 3, 4, 5\}$

kümesinin alt kümelerinin kaçında 4 bulunur, 5 bulunmaz?

How many of the subsets of the set a include 4 but not 5?

A) 2 B) 4 C) 8 D) 16 E) 32

20. $A \cup B = E$

$\Rightarrow$ $[(A \cap B') \cup (B \cap A')]' = ?$

A) A B) B C) $A \cup B$ D) $A \cap B$ E) $A - B$

21. $\frac{a! + 5! - (a-5)!}{(5-a)! + 4!} = ?$

A) 5 B) $\frac{239}{25}$ C) $\frac{121}{24}$ D) $\frac{119}{25}$ E) $\frac{24}{5}$

22. $f(x) = x + 2m$

$\Rightarrow$ **fofofof(x) = ?**

A) $x + 6m$ B) $x + 8m$ C) $x + 10m$ D) $4x + 8m$ E) $8x + 8m$

23. $x > -2$,

$f(x) = x^2 + 4x + 7$

$\Rightarrow$ $f^{-1}(x) = ?$

A) $-\sqrt{x-3} - 2$ B) $-\sqrt{x-3} + 2$ C) $\sqrt{x-3} - 2$ D) $\sqrt{x-3} + 2$ E) $\sqrt{x-32} + 3$

24. $f(x^2 - 8x + 10) = \dfrac{x+4}{x-3}$

$\Rightarrow$ **f(– 6) = ?**

A) 0 B) $\dfrac{8}{3}$ C) 4 D) 7 E) 8

25. $a \Delta b = 2a + 5b - 3$

$x \Delta x = x$

$\Rightarrow$ **x = ?**

A) $\dfrac{1}{3}$ B) $\dfrac{1}{2}$ C) 1 D) 2 E) 4

26. $\dfrac{2}{x} \Delta \dfrac{y}{3} = 3x + 4y - 1$

$\Rightarrow$ **3 Δ 5 = ?**

A) 40 B) $\dfrac{124}{3}$ C) 60 D) 61 E) 62

27. $k \in N$,

$15^{17k+4} \equiv x \pmod 6$

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

28. Bugünkü yaşları toplamı 33 olan 3 kardeşten büyük olan ortancanın yaşındayken ortanca da küçüğün yaşındaydı. Büyük kardeş ortanca kardeşin yaşındayken üçünün yaşları toplamı 24'tür.

Buna göre, küçük kardeş bugün kaç yaşındadır?

The sum of ages of 3 siblings is 33 years old today. When the oldest brother was at the same age as the median brother, the median brother was the same age as the youngest one. When the oldest brother was the same age as the median one, the sum of their ages was 24.

Accordingly, how old is the youngest brother today?

A) 8 B) 10 C) 11 D) 12 E) 13

29. 5 çuval unun parasını eşit olarak paylaşacak olan 3 kişiden 1. sinin parası olmadığı için diğer arkadaşları onun yerine de para koymuştur. 2. kişi 3500 TL, 3. kişi 5500 TL koyarak unun parasını ödemişlerdir.

Buna göre, 1. kişinin 3. kişiye olan borcu, 2. kişiye olan borcundan ne kadar fazladır?

Since one of the three people who will share the money of 5 sacks equally does not have money, other friends have given him debt. The second person paid 3500 tl, the third person paid 5500 TL.

Accordingly, how much is the debt of the 1st person to the 3rd person more than the debt from the 2nd person?

A) 3000 B) 2500 C) 2000 D) 1800 E) 1500

30. $a, b \in Z^+$,

$a + b = 24$

$\Rightarrow$ **max(a . b) – min(a . b) = ?**

A) 144 B) 132 C) 123 D) 121 E) 110

1-A	2-D	3-E	4-B	5-C	6-D	7-A	8-C	9-B	10-C	11-A	12-E	13-C	14-D	15-D	16-B
17-E	18-A	19-C	20-D	21-B	22-B	23-C	24-E	25-B	26-D	27-C	28-A	29-C	30-D		

1. $\left(\frac{7}{3}-\frac{1}{6}\right)-\left[\left(3:\frac{1}{6}\right).\frac{1}{2}-7\right]=?$

A) $\frac{1}{18}$ B) $\frac{1}{9}$ C) $\frac{1}{6}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

2. $25\frac{1}{3}-24\frac{1}{4}+23\frac{11}{12}=?$

A) $24\frac{1}{12}$ B) $24\frac{1}{6}$ C) $24\frac{1}{4}$ D) 25 E) 26

3. $a = 10$

$b = 2$

$\Rightarrow \frac{0,02}{0,001}+\frac{0,3}{0,05}-\frac{0,7}{0,35}=?$

A) 2a + 2b B) 2a + b C) a + 2b D) a + b E) a + 5b

4. $(a3)_5 + (132)_a = x$

$\Rightarrow x = ?$

A) 50 B) 53 C) 56 D) 57 E) 59

5. $3^m = 4$

$\Rightarrow \frac{6^{2m+1}}{4^{m+1}}=?$

A) 96 B) 72 C) 54 D) 48 E) 24

6. $\frac{a^5+a^6+a^7}{a^3+a^4+a^5}=9$

$\Rightarrow$ **max(a) = ?**

A) 18 B) 9 C) 6 D) 3 E) −3

7. $2.3^x+3^{x+1}=45$

$5^{x+1}+5^{x+y}=150$

$\Rightarrow y = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

8. $a.\sqrt{0,03}=6$

$\Rightarrow a = ?$

A) $22\sqrt{3}$ B) $20\sqrt{3}$ C) 20 D) $\sqrt{6}$ E) $\sqrt{3}$

9. $\dfrac{\sqrt{3.3}+\sqrt{1.1}}{\sqrt{4.4}+\sqrt{8.2}} = ?$

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

10. $x + y = 5$

$x . y = 3$

$\Rightarrow$ $x^2 + y^2 = ?$

A) 31 B) 29 C) 25 D) 19 E) 16

11. $3a - b = 7$

$\Rightarrow$ $9a^2 - 6ab + b^2 - 6a + 2b = ?$

A) 49 B) 45 C) 41 D) 38 E) 35

12. $a > 1,$

$a + \dfrac{2}{a} = 7$

$\Rightarrow$ $a - \dfrac{2}{a} = ?$

A) 49 B) $\sqrt{41}$ C) $\sqrt{37}$ D) $-\sqrt{37}$ E) $-\sqrt{41}$

13. $A = \dfrac{30B}{100}$

$B = \dfrac{40C}{100}$

$A = \dfrac{k . C}{100}$

$\Rightarrow$ $k = ?$

A) 12 B) 14 C) 16 D) 18 E) 20

14. $\dfrac{a}{b} = \dfrac{3}{7}$

$\dfrac{b}{c} = \dfrac{6}{4}$

$\Rightarrow$ $\dfrac{b + c}{c - a} = ?$

A) 5 B) 7 C) 9 D) 14 E) 17

15. $1 + \cfrac{6}{1 + \cfrac{4}{1 + \cfrac{3}{x + 2}}} = 4$

$\Rightarrow$ $x = ?$

A) -1 B) 0 C) 1 D) 2 E) 3

16. $a + b = 4$

$a + c = 7$

$b + c = 3$

$\Rightarrow$ $a . b . c = ?$

A) 12 B) 9 C) 8 D) 6 E) 0

17. $a < b < 0$

$$\Rightarrow \frac{a \,.\, |b-a|}{\big||b| + |a-b|\big|} = ?$$

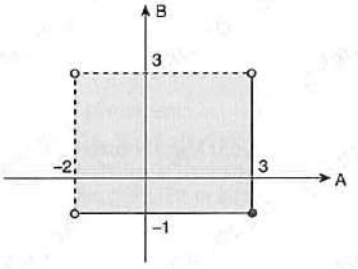
A) $b - a$ B) $a - b$ C) $a + b$ D) $-a - b$ E) b

18. $6 < x < 8$

$$\Rightarrow \frac{|(x-6).(x-8)| + |8-x|}{|-x^2 + 4x + 5|} = ?$$

A) $\frac{8-x}{x+1}$ B) $\frac{8+x}{x-1}$ C) $\frac{x-5}{x+1}$ D) $\frac{-x+5}{x-8}$ E) $\frac{x-5}{x+8}$

19.



$\Rightarrow$ **A − B = ?**

A) $[-2, -1]$ B) $[-2, -1)$ C) $(-2, -1)$ D) $[-1, 3]$ E) $(-2, -1) \cup \{3\}$

20. $A = \{x \mid -4 < 3x < 7,\ x \in R\}$

$B = \{x \mid 2 < 2x + 1 < 11,\ x \in Z\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

21. $30 \,.\, a! = b!$

$\Rightarrow$ **$\Sigma b = ?$**

A) 4 B) 6 C) 10 D) 30 E) 36

22. $f(x) = 4^{x-7}$

$\Rightarrow$ **$f(a + b + 1) = ?$**

A) $f(15) \,.\, f(a) \,.\, f(b)$ B) $f(a) \,.\, f(b + 3)$ C) $f(a + 1) \,.\, f(b - 1)$ D) $f(a) + f(b) - f(1)$ E) $f(a) - f(b) - f(-1)$

23. $f(x) = x^2 + 3x + 4$

$\Rightarrow$ **$(fof^{-1})(x) + (f^{-1}of)(x + 1) = ?$**

A) x B) $2x$ C) $2x + 1$ D) $2x - 1$ E) $2x - 3$

24. $f(x) = \dfrac{x+4}{x-3}$

$g(x) = 5^{x-7}$

$\Rightarrow$ **$gog^{-1}of^{-1}(2) = ?$**

A) 6 B) 10 C) 25 D) 125 E) 750

25. $a \star b = 3(a \Delta b) + 2a$

$a \Delta b = a + b - 5$

$\Rightarrow$ **$2 \star 2 = ?$**

A) 1 B) 2 C) 4 D) 5 E) 7

26. $3^a \equiv 2 \pmod 5$

$83 < a < 89$

$\Rightarrow$ **$a = ?$**

A) 84 B) 85 C) 86 D) 87 E) 88

27. $a \Delta b = 2a(a+b) \,.\, k$

$\Rightarrow$ **$1 \Delta (4 \Delta 2) = ?$**

A) $98k^2 + 4k$ B) $96k^2 + 2k$ C) $16k^2 + 4k$

D) $64k^2 + 16k$ E) $k^2 + 96k$

28. $a, b \in N,$

$(2a+1) \,.\, (3b+2) = 24$

$\Rightarrow$ **$(a+b) = ?$**

A) 1 B) 2 C) 3 D) 6 E) 7

29. $A = 1 + 2 + 3 + \ldots + 18$

$B = 2 + 4 + 6 + \ldots + 40$

$\Rightarrow$ **$B = ?$**

A) 2A B) 2A + 1 C) 2A + 3

D) 2A + 39 E) 2A + 78

30. Farklı şehirlerde bulunan A ve B araçları aynı hızlarla birbirlerine doğru hareket ettikten 2 saat sonra aralarında 300 km mesafe kalmaktadır. Eğer bu araçlar hızlarını iki katına çıkarsalardı 2 saat sonra aralarında 100 km mesafe kalacaktır.

Buna göre, $|AB|$ yolu kaç kilometredir?

After a and b vehicles in different cities move towards each other at the same speed, 300 km distance remains between them. If these vehicles had doubled their speed, after 2 hours there would be a distance of 100 km.

Accordingly, $|AB|$ how many kilometers is the way?

A) 400 B) 450 C) 500 D) 550 E) 600

1-C	2-D	3-A	4-B	5-E	6-D	7-A	8-B	9-C	10-D	11-E	12-B	13-A	14-B	15-A	16-E
17-B	18-A	19-E	20-B	21-E	22-A	23-C	24-B	25-A	26-D	27-B	28-C	29-E	30-C		