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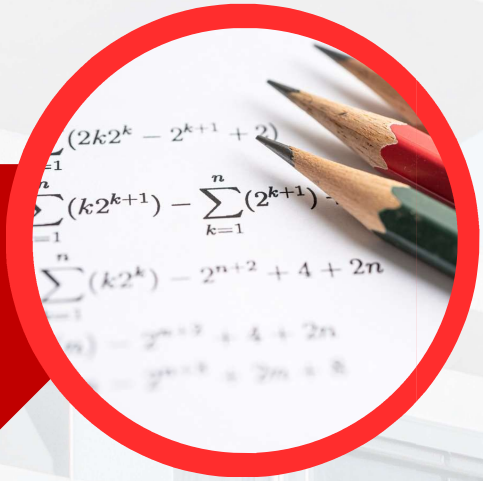
MATEMATIK 1,2

KONU ANLATIMLI

PUZA



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Herhangi bir bilgiyi belleğe sağlıklı olarak yerleştirebilmek için en bilinen ve en çok güvenilen yöntem tekrar yapmaktır. Kısa süreli bellekteki bir bilginin uzun süreli belleğe kaydolup geri çağırımının gerçekleşebilmesi için sistemli tekrar yapmak şarttır. Kitabımızdaki konular bu amaç doğrultusunda soru tiplerine ve özelliklerine göre gruplandırılmıştır. Konuya ait tüm özellikler tek tek ele alınmıştır. Ölçülmek istenen bilgi ile ilgili sorular, farklı açılardan sorularak bilginin pekiştirilmesi sağlanmıştır. Böylece öğrenciler bölümdeki soruların çözülmesi için tüm konunun bitmesini beklemeden öğrenilen soru tiplerinin çözümüne başlayabileceklerdir.

Kitabımızı referans alacak değerli meslektaşlarımız da konunun bitimini beklemeden, konunun anlatılan kısmından öğrencilerine ödev verebileceklerdir. Kitaptaki tüm sorular bilgilerin tümevarım yöntemi ile öğrenilmesi için basit soru tiplerinden karmaşık soru tiplerine adım adım geçiş yapılacak şekilde düzenlenmiştir. Bölüm sonu testlerinde üst düzey analiz gerektiren sorulara yer verilmiştir.

Değerli öğretmenlerimize ve sevgili öğrencilerimize yararlı olması dileğiyle…

Uğur PUZA

The must confident and well known way to put any kind of information into the memory safely is to repeat. For calling back the recorded information into the long term memory that is actually in the short term memory, systematic repetition is essential. The subjects in our book are classified according to the question types and attributes in parallel to this purpose. All the attributes regarding that topic have been considered one by one respectively.

The questions that are related to the information

to be tested, are asked from various points of views to consolidate the information. As a result the students have the chance to start solving questions of all question types directly without waiting for the completion of the chapter for solving the questions. Our colleagues have also chance to give their students homework from the completed part without waiting for the full completion of the related chapter. All questions in the book are organized with the induction method that start with the simpler question types and improve into more complex question types. In the chapter final tests there are also question types that require higher level analysis skills. With our best wishes that this work will be useful to both our teachers and dear students…

Uğur PUZA

İÇİNDEKİLER


TEMEL
KAVRAMLAR
BASIC TERMS

TEMEL KAVRAMLAR

■ Rakam *(Numeral)*

{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

■ Sayma Sayıları *(Counting Numbers)*

$N^+ = \{1, 2, 3, 4, ...\}$

■ Doğal Sayılar *(Natural Numbers)*

$N = \{0, 1, 2, 3, 4, ...\}$

■ Tam Sayılar *(Integers)*

$Z = \{..., -3, -2, -1, 0, 1, 2, 3, ...\}$

■ Negatif Tam Sayılar *(Negative Integers)*

$Z^- = \{-1, -2, -3, -4, ...\}$

■ Pozitif Tam Sayılar *(Positive Integers)*

$Z^+ = \{1, 2, 3, 4, 5, ...\}$

■ Rasyonel Sayılar *(Rational Numbers)*

$$Q = \left\{ \frac{a}{b} \middle| a, b \in Z, b \neq 0 \right\}$$

■ İrrasyonel Sayılar *(Irrational Numbers)*

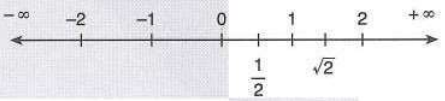
Rasyonel olmayan sayılardır. $\frac{a}{b}$ şeklinde yazılamazlar. $(\sqrt{2}, \sqrt{3}, \pi, e, ...)$ İrrasyonel sayılar Q' ile gösterilir.

Irrational numbers are the numbers, which are not rational numbers.

Cannot be written in the form of $\frac{a}{b}$. $(\sqrt{2}, \sqrt{3}, \pi, e, ...)$ *Irrational numbers are denoted with* Q'.

■ Reel Sayılar *(Real Numbers)*

$R = Q \cup Q'$



$R = (-\infty, +\infty)$

■ Not *(Note)*

$N^+ \subset N \subset Z \subset Q \subset R$

■ Asal Sayılar *(Prime Numbers)*

Yalnızca 1'e ve kendisine bölünebilen 1'den büyük pozitif sayılara asal sayılar denir.

Positive numbers bigger than 1 which are only divisible by 1 and itself are called prime numbers.

2, 3, 5, 7, 11, 13, 17, ...

■ Aralarında Asal Sayılar *(Relatively Prime Numbers)*

1'den başka ortak pozitif böleni olmayan doğal sayılara aralarında asal sayılar denir.

Natural numbers which don't have a common divisor other than 1 are called relatively prime numbers.

Örneğin 8 ve 15 aralarında asal sayılardır. *(For example 8 and 15 are relatively prime numbers)*

ÖZELLİK | Property 1

İşaretleri aynı olan sayılar toplanır. İşaretleri farklı olan sayılarda ise büyük sayıdan küçük sayı çıkartılır. Büyük sayının işareti verilir.

To add signed numbers with the same sign, add the magnitudes of the numbers and kreep the same sign.
To add signed numbers with different signs, subtract the magnitudes of the numbers and use the sign of the number with the greater magnitude.

1. $5-2+4-2=?$ — 5

2. $6+7-2-3=?$ — 8

3. $8+9-7+6-2=?$ — 14

4. $5-2+13-6-3=?$ — 7

5. $-6-4+11-8+4=?$ — −3

6. $-2-6+4-12+8=?$ — −8

7. $6-2+3-5-2=?$ — 0

8. $-7+6-11+8-3=?$ — −7

9. $13-7+5-2+6=?$ — 15

10. $13-7+13+12-6=?$ — 25

11. $14+12-6+8-6-3=?$ — 19

12. $-13-6+9-6+21=?$ — 5

13. $7-8+9-10+11=?$ — 9

14. $-12-13+10+11-8=?$ — −12

15. $-6-7+8-13+22-13=?$ — −9

TEMEL KAVRAMLAR

ÖZELLİK | Property 2

Çift işaretli ifadelerde işaretler çarpılarak tek işarete çevrilir.

If the signs are the same, the multiplication (or the quotient) is positive, if the signs are different, the multiplication (or the quotient) is negative)

$+ \cdot + = +$	$+ / + = +$
$+ \cdot - = -$	$+ / - = -$
$- \cdot + = -$	$- / + = -$
$- \cdot - = +$	$- / - = +$

1. $6 - (-3) = ?$

9

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

6

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

2

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

−11

5. $-(-6) - 8 + 4 = ?$

2

6. $-[6 - (-2)] - 5 = ?$

−13

7. $-8 - [-(-2)] = ?$

−10

8. $8 - (-6) - 3 + 6 = ?$

17

9. $-[8 - 2 - (-6)] = ?$

−12

10. $-12 - (-6) - (-4) = ?$

−2

11. $-4 - (-2) - 8 + 2 = ?$

−8

12. $-(-4 - (-2)) = ?$

2

13. $8 - 7 - (-(-2)) = ?$

−1

14. $-(-9) + (-4) - (-2) = ?$

7

15. $8 - [2 - (-6)] - 12 + (-2) = ?$

−14

ÖZELLİK | Property 3

- İşlem Öncelik Sırası
  1. Parantez içi
  2. Üs alma veya veya kök alma
  3. Çarpma işlemi veya bölme işlemi
  4. Toplama işlemi veya çıkarma işlemi

NOT: Bütün işlemler soldan sağa doğru yapılır.

- *Order of Operations (PEMDAS)*
  1. *Inside the Parenthesis*
  2. *Exponentials or radicals*
  3. *Multiplication or division operation*
  4. *Addition or subtraction operation*

NOTE: *All operations are done from left to right.*

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

−2

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

−14

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

6

4. $(-2)\cdot(-4)-2=?$

6

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

−16

6. $6\cdot 3-4\cdot(-3)=?$

30

7. $(-6)\cdot(-5)+2\cdot 6-2\cdot(3)=?$

36

8. $-3\cdot(-2)+6-2\cdot(-4)=?$

20

9. $-4\cdot(3-2\cdot 5)=?$

28

10. $-5+3\cdot[13-2\cdot(-3)]=?$

52

11. $16-2(4-4\cdot 4+4)=?$

32

12. $(8-2+3)\cdot(6-2-3)=?$

9

13. $-8-(-6\cdot 3-8)\cdot 2-(-5)=?$

49

14. $8-6\cdot(1-4\cdot 2)-2\cdot(-5)=?$

60

15. $-3\cdot(-6)-2\cdot[-6-(-3)]=?$

24

TEMEL KAVRAMLAR

ÖZELLİK | Property 4

Rasyonel ifadeler çarpım durumunda SADELEŞTİRİLEBİLİR.

Rational expressions can be simplified only under the multiplication property

$$\frac{a \cdot \cancel{b}}{\cancel{b}} = a$$

Rasyonel ifadeler toplam veya fark durumunda SADELEŞTİRİLEMEZ.

Rational expressions can not be simplified under addition or subtraction property.

$$\frac{a \pm \cancel{b}}{\cancel{b}} \neq a$$

1. $\frac{12}{3} + \frac{8}{4} = ?$

6

2. $\frac{15}{3} - \frac{4}{2} = ?$

3

3. $\frac{48}{4} + \frac{21}{3} - \frac{10}{5} = ?$

17

4. $\frac{42}{6} - \frac{20}{4} + \frac{18}{6} = ?$

5

5. $\frac{26}{2} + \frac{72}{6} - \frac{32}{4} = ?$

17

6. $\frac{36}{4} - \frac{24}{4} - \frac{44}{4} = ?$

−8

7. $\frac{42}{3} - \frac{12}{3} + \frac{84}{21} = ?$

14

8. $-\frac{45}{15} + \frac{28}{4} - \frac{39}{13} + \frac{48}{6} = ?$

9

9. $\frac{6 \cdot 4}{8} + \frac{20 \cdot 3}{6} = ?$

13

10. $\frac{8 \cdot 6}{12} - \frac{8 \cdot 5}{10} = ?$

0

11. $6 \cdot \frac{4}{12} + 4 \cdot \frac{10}{8} = ?$

7

12. $\frac{24 - 12}{6} - \frac{18 - 6}{2} = ?$

−4

13. $\frac{8 + 4}{4} - \frac{10 + 5}{5} = ?$

0

14. $\frac{12 - 6}{3} + \frac{18 - 6}{6} = ?$

4

15. $\frac{20 - 5}{5} + \frac{20 + 12}{4} = ?$

11

ÖZELLİK | Property 5

Çarpma işleminin toplama işlemi üzerine dağılma özelliği vardır.

Distributive property of multiplication over addition.

$a(x + y) = ax + ay$

1. $2 \cdot (x - 2) + 3 \cdot x = ?$

$5x - 4$

2. $2x - 3(4 - x) = ?$

$5x - 12$

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

$8x$

4. $-9a - 2(a - 2) - 3(3 - a) = ?$

$-8a - 5$

5. $5 - 2(6 - a) - 3(1 - 2a) = ?$

$8a - 10$

6. $\frac{12}{3}(4 - x) - 2(x + 1) = ?$

$14 - 6x$

7. $(2 - 11)x - 3(2x - 6) - 2 = ?$

$-15x + 16$

8. $\frac{12}{(6-2)}(-x + 2) - \frac{3 \cdot 4}{2}(x + 1) = ?$

$-9x$

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

$-x - 5y$

10. $2(2x - y) - 3(3x - 4y) = ?$

$-5x + 10y$

11. $\frac{48}{6}(x - 3) - \frac{15}{3}(2 - x) = ?$

$13x - 34$

12. $-\frac{6}{3}(-x + 2) - \frac{42}{2(-3)}(x - 1) = ?$

$9x - 11$

13. $18 - 3(x - 6) - 2(-x) = ?$

$-x + 36$

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

$4x - 9$

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

$x - 5$

TEMEL KAVRAMLAR

ÖZELLİK | Property 6

Ortak Paranteze Alma | Common Monomial Factor

- $ax + bx = x \cdot (a + b)$
- $ax + bx + x = x \cdot (a + b + 1)$

Çarpım durumundaki ifadelere terim denir. Terimlerde ortak ifade var ise bu ifade, terimlerden ayrılarak çarpım durumuna getirilir.

The factors of given algebraic expression consist of two or more algebraic expressions which when multiplied together produce the given expression.

Aşağıdaki ifadeleri ortak çarpan parantezine alınız

Take the common factor in parentheses following statements.

1. $3x + mx = ?$

$x(3 + m)$

2. $ay + by - y = ?$

$y(a + b - 1)$

3. $x^2y + y^2x = ?$

$xy(x + y)$

4. $x^3y^2 + xy^3 = ?$

$xy^2(x^2 + y)$

5. $6x^2y^3 + 8x^4y^2 = ?$

$2x^2y^2(3y + 4x^2)$

6. $12a^3b^4 - 20a^2b^3 = ?$

$4a^2b^3(3ab - 5)$

7. $ax^2 + a^2x - ax = ?$

$ax(x + a - 1)$

8. $a(x - y) + 4(x - y) = ?$

$(x - y) \cdot (a + 4)$

9. $3(x - y) + 5(y - x) = ?$

$2(y - x)$

10. $a(x + y) - b(x + y) = ?$

$(a - b) \cdot (x + y)$

11. $4(a - b)^2 + 5(a - b)^3 = ?$

$(a - b)^2 \cdot [4 + 5(a - b)]$

12. $37 \cdot 23 - 37 \cdot 13 = ?$

370

13. $a(x - 3) - (x - 3) = ?$

$(a - 1)(x - 3)$

14. $m(x - y)^3 + n(y - x)^3 = ?$

$(x - y)^3 \cdot (m - n)$

15. $a(x - y)^2 + b(y - x)^2 = ?$

$(x - y)^2 \cdot (a + b)$

ÖZELLİK | Property 7

Rasyonel Sayılarda İşlem
Operations with Fractions

- **Toplama ve Çıkarma İşlemi**
  Adding and Subtracting

$$\underset{(d)}{\frac{a}{b}} \mp \underset{(b)}{\frac{c}{d}} = \frac{ad \mp bc}{bd}$$

- **Çarpma İşlemi** | Multiplying

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$$

- **Bölme İşlemi** | Dividing

$$\frac{a}{b} : \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{a \cdot d}{b \cdot c}$$

1. $\frac{1}{3}+\frac{1}{2}=?$ $\boxed{\frac{5}{6}}$

2. $\frac{3}{5}-\frac{1}{2}=?$ $\boxed{\frac{1}{10}}$

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

4. $\frac{3}{4}-\frac{6}{5}+\frac{1}{3}=?$ $\boxed{-\frac{7}{60}}$

5. $2+\frac{1}{4}=?$ $\boxed{\frac{9}{4}}$

6. $3-\frac{1}{3}=?$ $\boxed{\frac{8}{3}}$

7. $\frac{6}{5}\cdot\frac{15}{4}=?$ $\boxed{\frac{9}{2}}$

8. $\frac{2}{5}-\frac{8}{3}\cdot\frac{6}{4}=?$ $\boxed{-\frac{18}{5}}$

9. $\frac{20}{3}:\frac{15}{6}=?$ $\boxed{\frac{8}{3}}$

10. $\frac{56}{14}:\frac{18}{7}=?$ $\boxed{\frac{14}{9}}$

11. $\frac{12}{5}:\frac{6}{15}-\frac{3}{2}=?$ $\boxed{\frac{9}{2}}$

12. $\dfrac{\frac{2}{3}}{\frac{4}{15}}=?$ $\boxed{\frac{5}{2}}$

13. $\dfrac{\frac{4}{15}}{\frac{8}{20}}=?$ $\boxed{\frac{2}{3}}$

14. $\dfrac{\frac{12}{20}}{\frac{4}{10}}+\dfrac{\frac{24}{20}}{\frac{8}{15}}=?$ $\boxed{\frac{15}{4}}$

15. $\dfrac{\frac{18}{5}}{\frac{12}{10}}-\frac{6}{15}:\frac{8}{10}=?$ $\boxed{\frac{5}{2}}$

TEMEL KAVRAMLAR

ÖZELLİK | Property 8

Denklem çözümünde bilinen sayılar eşitliğin bir tarafına, bilinmeyen x'li ifadeler eşitliğin diğer tarafına toplanır. Eşitliğin her iki tarafı aynı sayı ile toplanıp çıkarılabilir, çarpılıp bölünebilir.

When solving equations, the known numbers are collected on one side of the equation and unknown expressions involving x are collected on the other side. Both sides of the equation can be added or subtracted, multiplied or divided by the same number.

1. $2x - 5 = 13 \Rightarrow x = ?$ — 9

2. $3x + 2 = 11 \Rightarrow x = ?$ — 3

3. $2x - 8 = 6 + x \Rightarrow x = ?$ — 14

4. $3x + 2 = 17 - 2x \Rightarrow x = ?$ — 3

5. $6x - 7 + 2x = 5x + 8 \Rightarrow x = ?$ — 5

6. $5x + 2 - 3x = x + 6 \Rightarrow x = ?$ — 4

7. $3(x - 1) - 5 = x \Rightarrow x = ?$ — 4

8. $2 - x = 6 - 2 + 1 \Rightarrow x = ?$ — −3

9. $x - 2(-4) = 2(-3) \Rightarrow x = ?$ — −14

10. $2(-3) + x - 2 = -3(-4) \Rightarrow x = ?$ — 20

11. $3x - 4 = 2x + 5(-2) \Rightarrow x = ?$ — −6

12. $x - 8 - 2(-x) = x + 2 \Rightarrow x = ?$ — 5

13. $2x - (-x) + 4 = x + 6 \Rightarrow x = ?$ — 1

14. $x - (-2) + 3x + 4 = x - 3 \Rightarrow x = ?$ — −3

15. $3x + 2 - (-x) = 2x - 4 \Rightarrow x = ?$ — −3

ÖZELLİK | Property 9

$\frac{a}{b} = \frac{c}{d}$ denklem sisteminde $ad = bc$

$\frac{a}{b} = \frac{c}{d}$ *in the equation system,* $ad = bc$

1. $\frac{2}{4} = \frac{x}{8}$ $\Rightarrow x = ?$ — 4

2. $\frac{12}{x} = 4$ $\Rightarrow x = ?$ — 3

3. $\frac{x}{4} = 2$ $\Rightarrow x = ?$ — 8

4. $\frac{4}{x+1} = 2$ $\Rightarrow x = ?$ — 1

5. $\frac{x+3}{2} = 4$ $\Rightarrow x = ?$ — 5

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

7. $\frac{x-1}{2} = x+2$ $\Rightarrow x = ?$ — -5

8. $\frac{x+2}{3} = -x-6$ $\Rightarrow x = ?$ — -5

9. $\frac{x+1}{2} = \frac{x-1}{3}$ $\Rightarrow x = ?$ — -5

10. $\frac{3}{x-2} = 6$ $\Rightarrow x = ?$ — $\frac{5}{2}$

11. $\frac{x-(-1)}{2} = 4$ $\Rightarrow x = ?$ — 7

12. $\frac{2x-1}{3} = 5$ $\Rightarrow x = ?$ — 8

13. $\frac{x+2}{3} = \frac{2x-1}{2}$ $\Rightarrow x = ?$ — $\frac{7}{4}$

14. $\frac{2x+3}{2} = \frac{x-1}{4}$ $\Rightarrow x = ?$ — $-\frac{7}{3}$

15. $\frac{2(x+1)}{3} = 4$ $\Rightarrow x = ?$ — 5

TEMEL KAVRAMLAR

ÖZELLİK | Property 10

$a \in R \quad n \in N^+$

- $a^n = \underbrace{a \cdot a \cdot a \cdot \ldots\ldots \cdot a}_{\text{n tane } (n\text{-times})}$
- $x \neq 0 \qquad x^0 = 1 \qquad 0^x = 0$
- $a^{-1} = \frac{1}{a} \qquad \left(\frac{a}{b}\right)^{-1} = \frac{b}{a} \qquad a^{-n} = \frac{1}{a^n}$

1. $3^3 = ?$

27

2. $2^4 - 3^2 = ?$

7

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

9

4. $4^3 - 3^2 + 7^0 = ?$

56

5. $\left(\frac{1}{7}\right)^{-1} - 8^0 = ?$

6

6. $\frac{5^2 - 3^2}{5 - (-3)} = ?$

2

7. $4^2 - (-3^0) \cdot 2 = ?$

18

8. $3^2 - (-2)^0 \cdot 3 = ?$

6

9. $-3^2 \cdot 2 + 4 = ?$

−14

10. $(-2)^4 \cdot 3 - 2 = ?$

46

11. $3^2 \cdot (-2)^2 - (-2) = ?$

38

12. $-9^2 - 3^3 + (-8)^2 = ?$

−44

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

4

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

17

15. $3 \cdot \left(\frac{1}{2}\right)^{-4} - \left(\frac{1}{5}\right)^{-2} = ?$

23

ÖZELLİK | Property 11

İki Kare Farkı | Difference of Two Squares

$a^2 - b^2 = (a - b) \cdot (a + b)$

1. $x^2 - y^2 = ?$

$(x - y) \cdot (x + y)$

2. $a^2 - 4 = ?$

$(a - 2) \cdot (a + 2)$

3. $a^4 - 16 = ?$

$(a^2 - 4) \cdot (a^2 + 4)$

4. $4x^2 - y^2 = ?$

$(2x - y) \cdot (2x + y)$

5. $9a^2 - 4b^2 = ?$

$(3a - 2b) \cdot (3a + 2b)$

6. $x^2 - 1 = ?$

$(x - 1) \cdot (x + 1)$

7. $(7 - x) \cdot (7 + x) = ?$

$49 - x^2$

8. $x^2 - \frac{1}{x^2} = ?$

$\left(x - \frac{1}{x}\right) \cdot \left(x + \frac{1}{x}\right)$

9. $16x^2 - \frac{4}{25y^2} = ?$

$\left(4x - \frac{2}{5y}\right) \cdot \left(4x + \frac{2}{5y}\right)$

10. $\frac{1}{9} - \frac{x^2}{4} = ?$

$\left(\frac{1}{3} - \frac{x}{2}\right) \cdot \left(\frac{1}{3} + \frac{x}{2}\right)$

11. $a^6 - 4b^2 = ?$

$(a^3 - 2b) \cdot (a^3 + 2b)$

12. $\frac{9 - 4a^2}{3 - 2a} = ?$

$3 + 2a$

13. $\frac{x^2 - 4}{x + 2} + \frac{x^2 - 9}{x - 3} = ?$

$2x + 1$

14. $\frac{504^2 - 502^2}{505^2 - 501^2} = ?$

$\frac{1}{2}$

15. $(a - b)^2 - 16 = ?$

$(a - b - 4) \cdot (a - b + 4)$

TEMEL KAVRAMLAR

ÖZELLİK | Property 12

$x^2 + ax + b$ gibi İfadeleri Çarpanlarına Ayırma

Factoring Expressions Such as $x^2 + ax + b$

$x^2 + ax + b$ $\quad b = m \cdot n$

$\quad\quad a = m + n$

$m \quad n$

$\Rightarrow x^2 + ax + b = (x + m)(x + n)$

1. $x^2 + 2x + 1 = ?$

$(x + 1) \cdot (x + 1)$

2. $x^2 + 5x + 6 = ?$

$(x + 3) \cdot (x + 2)$

3. $x^2 - 4x + 3 = ?$

$(x - 3) \cdot (x - 1)$

4. $x^2 - 8x + 12 = ?$

$(x - 6) \cdot (x - 2)$

5. $x^2 - 2x - 8 = ?$

$(x - 4) \cdot (x + 2)$

6. $x^2 - 3x - 10 = ?$

$(x - 5) \cdot (x + 2)$

7. $x^2 + 3x - 10 = ?$

$(x + 5) \cdot (x - 2)$

8. $x^2 + 7x - 18 = ?$

$(x + 9) \cdot (x - 2)$

9. $x^2 + 9x + 20 = ?$

$(x + 5) \cdot (x + 4)$

10. $x^2 - 5x + 6 = ?$

$(x - 3) \cdot (x - 2)$

11. $x^2 + 5x - 6 = ?$

$(x + 6) \cdot (x - 1)$

12. $x^2 + 4x - 12 = ?$

$(x + 6) \cdot (x - 2)$

13. $x^2 - (a + b)x + ab = ?$

$(x - a) \cdot (x - b)$

14. $x^2 + ax + b = (x - 1)(x - 3)$

$\Rightarrow a + b = ?$

-1

15. $x^2 - 16x + 4b = (x - 12) \cdot (x - 4)$

$\Rightarrow b = ?$

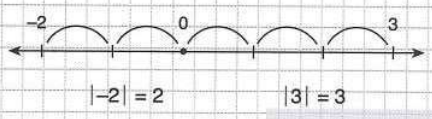
12

ÖZELLİK | Property 13

Mutlak Değer | Absolute Value

Bir sayının mutlak değeri, o sayının "0" (sıfıra) olan uzaklığıdır. Mutlak değer, daima pozitif bir sayıdır veya sıfırdır.

The absolute volue of a number is the distance from the number to the zero on the number line. The absolute volue is always positive or zero.



1. $|-4| = ?$

4

2. $|3-8| = ?$

5

3. $|2+(-3)\cdot 2| = ?$

4

4. $|-3| + |-4| = ?$

7

5. $||-6|-|2|| = ?$

4

6. $|8-4-2-1| = ?$

1

7. $|-8| - |-2| + |6| = ?$

12

8. $||-7-|2|| = ?$

9

9. $||-2|-6| = ?$

4

10. $||4|-13| + |6-11| = ?$

14

11. $|(2)\cdot(-3)+1| = ?$

5

12. $2\cdot|6:(-3)| = ?$

4

13. $8-|12-(-3)\cdot(-2)| = ?$

2

14. $-8+|6\cdot(-1)+3\cdot 4| = ?$

-2

15. $3\cdot 2-|1-2\cdot(-3)+4\cdot 2| = ?$

-9

1. $3-2+1-6=?$

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

2. $-2-5+3-1=?$

A) -6 B) -5 C) -4 D) -2 E) -1

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

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

4. $-12-(-4)+(-2)=?$

A) -16 B) -14 C) -12 D) -10 E) -8

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

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

6. $-(-2)+(-6)-[3-(+1)]=?$

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

7. $(-6)\cdot(2)-3=?$

A) -18 B) -15 C) -12 D) -10 E) -8

8. $(-8):2-3\cdot(-2)=?$

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

9. $12 - 3[1 - 2 \cdot (-3)] = ?$

A) 33 B) 24 C) 0 D) – 9 E) –12

10. $\frac{15}{5} - \frac{6}{3} = ?$

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

11. $\frac{24}{4} + \frac{18}{6} - \frac{10}{5} = ?$

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

12. $\frac{16 - (-2)}{2} - \frac{14 - 2 \cdot (-1)}{4} = ?$

A) 8 B) 6 C) 5 D) 4 E) 2

13. $|-6| + |-2| = ?$

A) – 8 B) – 4 C) 0 D) 4 E) 8

14. $|16| - |-4| = ?$

A) 18 B) 16 C) 12 D) 10 E) 8

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

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

16. $|-12 - 4 : 2| = ?$

A) 14 B) 12 C) 10 D) 8 E) 6

1. $2x - 4 = 8$
$\Rightarrow x = ?$

A) 6 B) 4 C) 3 D) 2 E) 1

2. $6 - 3x = 18$
$\Rightarrow x = ?$

A) -6 B) -4 C) -2 D) 2 E) 4

3. $2x - 3 - x = 18$
$\Rightarrow x = ?$

A) 21 B) 18 C) 15 D) 12 E) 6

4. $3x - (-x) + 2 = 2x - 2$
$\Rightarrow x = ?$

A) 6 B) 2 C) 0 D) -2 E) -6

5. $\frac{x}{6} = \frac{5}{2}$
$\Rightarrow x = ?$

A) 20 B) 15 C) 12 D) 10 E) 6

6. $\frac{x}{3} = 2$
$\Rightarrow x = ?$

A) 12 B) 10 C) 8 D) 6 E) 4

7. $\frac{x-1}{2} = \frac{10}{4}$
$\Rightarrow x = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

8. $\frac{x-1}{3} = \frac{x+1}{2}$
$\Rightarrow x = ?$

A) -5 B) -3 C) 0 D) 3 E) 5

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

A) $\frac{-1}{6}$ B) $\frac{1}{6}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{5}{6}$

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

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

11. $2-\frac{1}{2}=?$

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

12. $3+\frac{1}{2}-\frac{1}{3}=?$

A) $\frac{5}{2}$ B) $\frac{19}{6}$ C) $\frac{23}{6}$ D) $\frac{17}{3}$ E) 6

13. $\frac{15}{4}:\frac{5}{8}=?$

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

14. $\frac{12}{5}:\frac{4}{15}-8=?$

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

15. $\dfrac{\frac{2}{3}}{\frac{5}{15}}=?$

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

16. $\dfrac{\frac{1}{3}-2}{\frac{5}{6}}=?$

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

1. $18 - 6 : 2 - 4 \cdot (-3) = ?$

A) 15 B) 18 C) 24 D) 27 E) 32

2. $6 - 2 \cdot [4 \cdot (2 - 5) : 2] = ?$

A) – 24 B) – 12 C) 18 D) 30 E) 42

3. $8 - (-2) \cdot [-(12 - 7) - (6 - 3)] = ?$

A) –12 B) –8 C) 0 D) 8 E) 24

4. $-\{-(-[2 - 5]) + 7\} - [-(3 - 1)]^2 = ?$

A) – 8 B) – 6 C) 0 D) 6 E) 14

5. $20 \cdot (-2) - (-3) \cdot 6 + 20 : 4 = ?$

A) – 53 B) – 27 C) – 17 D) 17 E) 27

6. $4 - 3 \cdot [5 - 2 \cdot (3 - 6)] = ?$

A) – 30 B) – 29 C) – 5 D) 7 E) 37

7. $6 \cdot 2 - 2 \cdot (5 - 7) - 10 = ?$

A) – 2 B) 0 C) 2 D) 4 E) 6

8. $2 \cdot [(6 - 4) + 2 \cdot (7 + 1)] - 20 = ?$

A) – 8 B) – 2 C) 0 D) 16 E) 36

9. $9-[8-(7-5)-3]-4=?$

A) 6 B) 5 C) 4 D) 2 E) -1

10. $\frac{36\cdot 35\cdot 33}{55\cdot 63}=?$

A) 12 B) 15 C) 20 D) 25 E) 36

11. $\frac{20\cdot 36\cdot 45}{25\cdot 27\cdot 8}=?$

A) 3 B) 6 C) 12 D) 18 E) 30

12. $\frac{(-2)^2+(-3)-(-5)}{-1^2-2}=?$

A) -1 B) -2 C) -3 D) -4 E) -6

13. $\frac{(2\cdot 3)^2}{2\cdot 3^2}+4^0=?$

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

14. $\frac{(-6)-(-2)^2\cdot(-3)}{-2^2+2}=?$

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

15. $\frac{(-16)^0-(-2)+(-3)}{4-3^2}=?$

A) $-\frac{1}{5}$ B) $-\frac{1}{13}$ C) 0 D) $\frac{1}{13}$ E) 2

16. $\frac{(2^0\cdot 3)^2-3}{-[4+(-1)]^0}=?$

A) -6 B) -2 C) 0 D) 2 E) 3

1. $5 \cdot (y - x - 3) + 3 \cdot [2(x - y) + 5] = ?$

A) $x - y$ B) $y + x$ C) $x - y - 30$
D) $y - x$ E) $y - x + 30$

2. $2a + 3 \cdot (a + b) - 2 \cdot (a + b) - b = ?$

A) $3a$ B) $2a+4b$ C) $a+3b$
D) $2a+3b$ E) $3a+4b$

3. $3 \cdot (2x - 3y) + 4 \cdot [2y - 2 \cdot (x + 4)] + 2 \cdot (x + y) = ?$

A) $-2x - y + 16$ B) $x - 16$
C) $y + 16$ D) $y - 32$
E) $2x + y$

4. $3a - 4 + 9b - 5 \cdot (2b - a) - 2 \cdot (3a - 2) = ?$

A) $-8a - b - 8$ B) $-8a - b$ C) $b - a$
D) $2a - b$ E) $2a$

5. $-\{x - [2x - (3x + 4x) - x] - 5x\} + 6x = ?$

A) $2x$ B) $3x$ C) $4x$ D) $5x$ E) $6x$

6. $-2y \cdot [-(4y - 2y + x)] - 2xy = ?$

A) $4y^2$ B) $4y$ C) $-4xy$
D) $4y - 4x$ E) $-4y^2$

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

A) $-2x$ B) 0 C) $4x$ D) $8x$ E) $14x$

8. $\frac{1}{2} - \frac{5}{6} + \frac{3}{4} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{5}{12}$ D) $\frac{1}{2}$ E) $\frac{7}{12}$

9. $\frac{3}{4}:\left(\frac{3}{4}-\frac{5}{6}-\frac{2}{3}\right)=?$

A) $-\frac{16}{10}$ B) -2 C) -1 D) 2 E) $\frac{4}{3}$

10. $\frac{7}{3}-\left[\left(\frac{5}{3}\right)+\left(-\frac{4}{3}\right)\right]=?$

A) -1 B) $\frac{3}{2}$ C) 1 D) 2 E) $\frac{16}{3}$

11. $\frac{3}{2}-\frac{1}{2}:\frac{3}{5}+\frac{5}{4}\cdot\frac{1}{3}=?$

A) $\frac{3}{4}$ B) $\frac{5}{6}$ C) $\frac{11}{12}$ D) 1 E) $\frac{13}{12}$

12. $\frac{x\cdot y^2}{y^3}-\frac{x}{y}+\frac{x^3}{x}=?$

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

13. $\frac{x^3\cdot y^2}{x^2y}+\frac{(x+y)\cdot x^3}{x^2}-\frac{xy^3}{y^2}=?$

A) $x\cdot y$ B) $x\cdot y^2$ C) $x\cdot(x+y)$ D) $(x+y)\cdot x-\frac{x}{y}$ E) $x-y$

14. $\frac{x^2\cdot y^2}{y^3}-\frac{(x^2-y)}{y}=?$

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

15. $\frac{[(-1)+(-3)]^2-2^2\cdot 3}{4:2}=?$

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

16. $\frac{4\cdot[20-(4-7)+27]\cdot(6^2-8)}{(3^2-6^0)\cdot(9^2-11)}=?$

A) 1 B) 2 C) 4 D) 6 E) 10

1. $3^2 - 2^2 = ?$

A) 14 B) 13 C) 9 D) 5 E) 4

2. $2^3 \cdot (-2)^2 - (-1) = ?$

A) 34 B) 33 C) 32 D) – 33 E) – 31

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

A) 18 B) 16 C) –16 D) –18 E) – 20

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

$\Rightarrow x = ?$

A) 10 B) 9 C) 7 D) 5 E) 3

5. $2x - 3(x - 1) = ?$

A) –x B) x – 3 C) x + 3

D) – x + 3 E) – x – 3

6. $2(x - 4) - 3(3 - 2x) = ?$

A) 8x – 17 B) 4x – 15 C) – 4x – 17

D) 4x – 17 E) 3x – 6

7. $\frac{2(x-y) + 3(y-x)}{x-y} = ?$

A) 2x – 2y B) –1 C) 1

D) x + y E) y – x

8. $3(a - b)^2 - (b - a)^2 = ?$

A) 4(b – a) B) $(b - a)^2$ C) $2(a - b)^2$

D) 2(b – a) E) 2(a – b)

9. $|3 + (-2) \cdot (5)| = ?$

A) 13 B) 7 C) 6 D) 4 E) 3

10. $3x - 6 = 2x - (2) \cdot (-4)$
$\Rightarrow x = ?$

A) 14 B) 12 C) 11 D) 10 E) 8

11. $-2^2 - 3^{-1} + (-5)^0 = ?$

A) $\frac{-10}{3}$ B) $\frac{-1}{3}$ C) $\frac{14}{3}$ D) $\frac{1}{12}$ E) $\frac{5}{12}$

12. $\frac{16}{2}(x-3) + \frac{10}{2}(x-2) = ?$

A) $3x - 5$ B) $13x - 34$ C) $15x - 20$
D) $15x - 33$ E) $10x - 8$

13. $\frac{y(x-2) - (x-2)}{x-2} = ?$

A) $(y-1)(x-2)$ B) $(y-1)(x-3)$ C) $y - 1$
D) $(x-2)$ E) $y + 1$

14. $-2 \cdot (-4) - 3[-3 - (-1)] = ?$

A) 18 B) 16 C) 14 D) 12 E) 10

15. $\frac{2x-1}{3} = \frac{x+1}{2}$
$\Rightarrow x = ?$

A) 8 B) 7 C) 6 D) 5 E) 2

16. $\frac{\frac{5}{6} : \frac{10}{3}}{\frac{1}{2} + 1} = ?$

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

YANIT ANAHTARI | ANSWER KEY

TEST 1

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

TEST 2

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

TEST 3

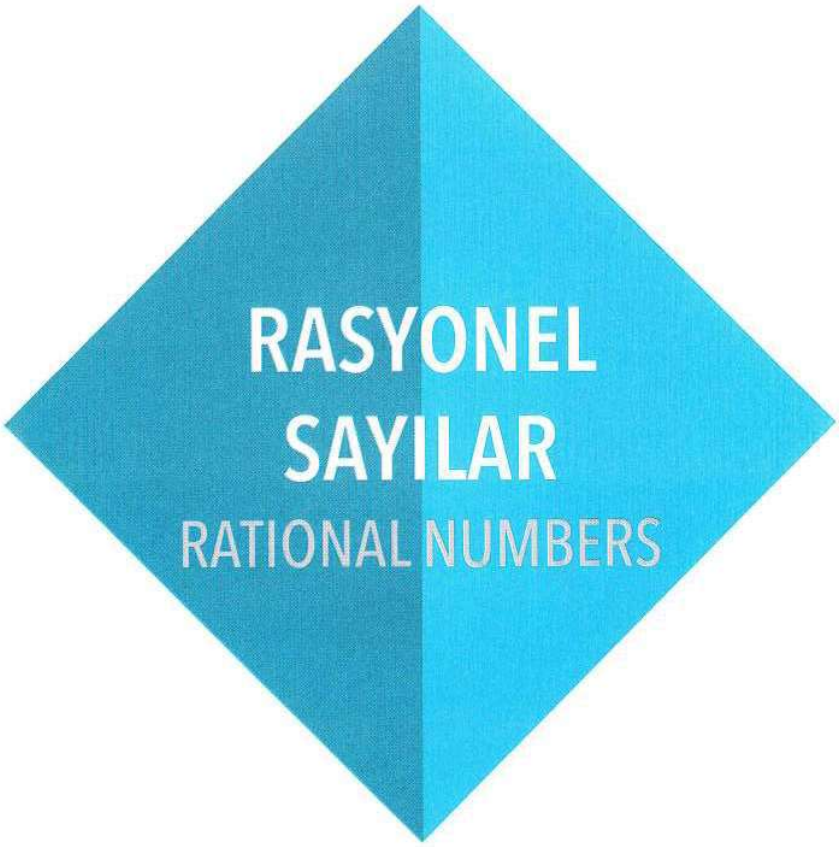
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D	C	B	A	C	B	E	D	D	A	B	B	C	A	C	A

TEST 4

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

TEST 5

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


RASYONEL
SAYILAR
RATIONAL NUMBERS

RASYONEL SAYILAR

ÖZELLİK | Property 1

Rasyonel Sayılarda İşlem | Operations with Fractions

$$Q = \left\{ \frac{a}{b} \mid a, b \in Z \quad b \neq 0 \right\}$$

Paydalar aynı ise *(with same denominators)*

- $\frac{a}{b} \mp \frac{c}{b} = \frac{a \mp c}{b}$

Paydalar farklı ise *(with not the same denominators)*

- $\underset{(d)}{\frac{a}{b}} \mp \underset{(b)}{\frac{c}{d}} = \frac{ad \mp bc}{bd}$

1. $\frac{2}{5} - \frac{1}{2} = ?$ $\boxed{-\frac{1}{10}}$

2. $\frac{3}{2} - \frac{1}{3} = ?$ $\boxed{\frac{7}{6}}$

3. $\frac{7}{5} + \frac{1}{6} = ?$ $\boxed{\frac{47}{30}}$

4. $\frac{4}{5} + \frac{6}{8} = ?$ $\boxed{\frac{31}{20}}$

5. $\frac{7}{18} - \frac{2}{9} = ?$ $\boxed{\frac{1}{6}}$

6. $\frac{7}{8} + \frac{9}{6} = ?$ $\boxed{\frac{19}{8}}$

7. $\frac{5}{7} - \frac{3}{14} = ?$ $\boxed{\frac{1}{2}}$

8. $\frac{1}{7} - \frac{1}{3} = ?$ $\boxed{-\frac{4}{21}}$

9. $\frac{4}{3} + \frac{1}{4} - \frac{1}{2} = ?$ $\boxed{\frac{13}{12}}$

10. $\frac{1}{3} + \frac{3}{4} + \frac{5}{6} = ?$ $\boxed{\frac{23}{12}}$

11. $\frac{1}{2} + \frac{1}{5} - \frac{1}{3} = ?$ $\boxed{\frac{11}{30}}$

12. $\frac{1}{3} - \frac{1}{2} + \frac{1}{5} = ?$ $\boxed{\frac{1}{30}}$

13. $\frac{5}{4} + \frac{1}{2} - \frac{1}{3} = ?$ $\boxed{\frac{17}{12}}$

14. $\frac{2}{5} - \frac{1}{10} + \frac{3}{15} = ?$ $\boxed{\frac{1}{2}}$

15. $\frac{2}{5}+\frac{3}{2}-\frac{1}{4}=?$ $\boxed{\frac{33}{20}}$

16. $\frac{9}{5}-\frac{3}{4}+\frac{7}{10}=?$ $\boxed{\frac{7}{4}}$

17. $\frac{2}{5}+\frac{1}{2}-\frac{2}{4}+\frac{3}{10}=?$ $\boxed{\frac{7}{10}}$

18. $\left(\frac{3}{6}-\frac{1}{4}\right)+\left(\frac{1}{2}-\frac{1}{3}\right)=?$ $\boxed{\frac{5}{12}}$

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

20. $\left(\frac{8}{5}-\frac{3}{10}\right)+\left(\frac{1}{4}-\frac{1}{8}\right)=?$ $\boxed{\frac{57}{40}}$

21. $\left(\frac{2}{7}-\frac{3}{5}\right)-\left(\frac{2}{5}+\frac{2}{7}\right)=?$ $\boxed{-1}$

22. $\frac{24}{88}-\frac{42}{77}=?$ $\boxed{-\frac{3}{11}}$

23. $\frac{15}{10}+\frac{16}{20}-\frac{12}{8}=?$ $\boxed{\frac{4}{5}}$

24. $\frac{15}{20}+\frac{42}{30}-\frac{56}{40}=?$ $\boxed{\frac{3}{4}}$

25. $\frac{17}{51}+\frac{19}{57}-\frac{13}{39}=?$ $\boxed{\frac{1}{3}}$

26. $\frac{72}{90}-\frac{24}{40}+\frac{24}{36}=?$ $\boxed{\frac{13}{15}}$

27. $\left(\frac{15}{6}-\frac{20}{16}+\frac{4}{6}\right)+\frac{4}{3}=?$ $\boxed{\frac{13}{4}}$

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

29. $\frac{2}{3}+\frac{2}{4}-\frac{3}{2}-\frac{3}{6}=?$ $\boxed{-\frac{5}{6}}$

30. $\frac{16}{56}+\frac{35}{49}-\frac{14}{35}-\frac{9}{15}=?$ $\boxed{0}$

RASYONEL SAYILAR

ÖZELLİK | Property 2

Rasyonel Sayılarda İşlem | Operations with Fractions

- Çarpma *(Multiplication)*

$$\frac{a}{b}\cdot\frac{c}{d}=\frac{a\cdot c}{b\cdot d}$$

- Bölme *(Division)*

$$\frac{a}{b}:\frac{c}{d}=\frac{a}{b}\cdot\frac{d}{c}=\frac{a\cdot d}{b\cdot c}$$

1. $\frac{3}{4}\cdot\frac{2}{5}=?$ $\boxed{\frac{3}{10}}$

2. $\frac{2}{3}\cdot\frac{15}{4}=?$ $\boxed{\frac{5}{2}}$

3. $\frac{4}{10}\cdot\frac{5}{2}=?$ $\boxed{1}$

4. $\frac{3}{10}\cdot\frac{5}{2}=?$ $\boxed{\frac{3}{4}}$

5. $\frac{21}{48}\cdot\frac{24}{7}=?$ $\boxed{\frac{3}{2}}$

6. $\frac{1}{2}\cdot\frac{3}{4}\cdot\frac{2}{9}=?$ $\boxed{\frac{1}{12}}$

7. $\frac{3}{8}\cdot\frac{4}{9}\cdot\frac{6}{2}=?$ $\boxed{\frac{1}{2}}$

8. $\frac{2}{15}\cdot\frac{5}{3}\cdot\frac{9}{4}=?$ $\boxed{\frac{1}{2}}$

9. $\frac{4}{9}\cdot\frac{3}{7}\cdot\frac{14}{5}=?$ $\boxed{\frac{8}{15}}$

10. $\frac{4}{9}:\frac{2}{3}=?$ $\boxed{\frac{2}{3}}$

11. $\frac{2}{7}:\frac{3}{14}=?$ $\boxed{\frac{4}{3}}$

12. $\frac{16}{15}:\frac{8}{5}=?$ $\boxed{\frac{2}{3}}$

13. $\frac{16}{27}:\frac{4}{9}=?$ $\boxed{\frac{4}{3}}$

14. $\frac{48}{16}:\frac{32}{10}=?$ $\boxed{\frac{15}{16}}$

15. $\dfrac{\frac{15}{10}}{\frac{10}{12}} = ?$ $\boxed{\frac{9}{5}}$

16. $\dfrac{\frac{1}{2}+\frac{2}{3}}{\frac{1}{4}-\frac{1}{6}} = ?$ $\boxed{14}$

17. $\frac{6}{15}-\frac{1}{2}:\frac{3}{4} = ?$ $\boxed{-\frac{4}{15}}$

18. $\frac{2}{7}-\frac{6}{7}:\left(-\frac{6}{5}\right) = ?$ $\boxed{1}$

19. $\frac{5}{11}\cdot\frac{22}{15}:\frac{2}{3} = ?$ $\boxed{1}$

20. $\left(\frac{81}{64}\cdot\frac{8}{9}\right):\frac{3}{2} = ?$ $\boxed{\frac{3}{4}}$

21. $\frac{1}{3}:\left(\frac{6}{4}\cdot\frac{1}{3}+\frac{1}{2}\right) = ?$ $\boxed{\frac{1}{3}}$

22. $\dfrac{4}{\frac{4}{3}+\frac{1}{3}} = ?$ $\boxed{\frac{12}{5}}$

23. $\frac{3}{4}:\left(\frac{1}{2}-\frac{1}{6}\right) = ?$ $\boxed{\frac{9}{4}}$

24. $\dfrac{\frac{3}{2}+\frac{2}{3}}{\frac{1}{2}:2} = ?$ $\boxed{\frac{26}{3}}$

25. $\dfrac{\frac{3}{2}}{6}-\dfrac{2}{\frac{4}{5}} = ?$ $\boxed{-\frac{9}{4}}$

26. $\left[\left(-\frac{1}{2}\right)+(-3)\cdot\frac{1}{5}\right]:\frac{2}{5} = ?$ $\boxed{-\frac{11}{4}}$

27. $\left(\frac{3}{2}+\frac{1}{2}\right)\cdot\frac{3}{4}+\left(\frac{1}{5}+\frac{2}{5}\right):\frac{4}{15} = ?$ $\boxed{\frac{15}{4}}$

28. $\left(\frac{1}{3}:\frac{4}{3}\right)-\left(\frac{15}{4}\cdot\frac{3}{20}\right) = ?$ $\boxed{-\frac{5}{16}}$

29. $\left(\frac{4}{3}:\frac{5}{3}-\frac{1}{5}\right)\cdot 10 = ?$ $\boxed{6}$

30. $\left(\frac{1}{3}\cdot 2\right)-\left(2:\frac{2}{3}\right) = ?$ $\boxed{-\frac{7}{3}}$

RASYONEL SAYILAR

ÖZELLİK | Property 3

Tamsayılı Kesir | Mixed Number

$a \geq b > 0$ olmak üzere $\frac{a}{b}$ bileşik kesrinin payı (a), paydası (b) ye bölündüğünde bölüm c, kalan d ise $\frac{a}{b} = c\frac{d}{b}$ olarak yazılır.

Change the improper fraction to a mixed number.
Divide the numerator by the denominator to find the whole number if there is a remainder, write it over the denominator to form the fraction part $\frac{a}{b} = c\frac{d}{b}$ *where c is the quotient remainder is d*
in order words;

$$c\frac{d}{b} = c + \frac{d}{b}$$

Örnek | Example

$\frac{11}{5}$

$$\begin{array}{r|l} 11 & 5 \\ \hline -10 & 2 \\ \hline 1 & \end{array}$$

$\frac{11}{5} = 2\frac{1}{5}$

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

2. $2\frac{1}{5} + 2\frac{2}{5} = ?$ — $\frac{23}{5}$

3. $2\frac{4}{3} - 3 \cdot \frac{1}{6} = ?$ — $\frac{17}{6}$

4. $2\frac{3}{4} - \frac{1}{2} + 1 = ?$ — $\frac{13}{4}$

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

6. $2\frac{3}{4} - 2\frac{3}{2} + \frac{1}{4} = ?$ — $-\frac{1}{2}$

7. $3\frac{6}{11} + 2\frac{5}{11} = ?$ — 6

8. $5\frac{2}{27} + 6\frac{25}{27} = ?$ — 12

PUZZA YAYINLARI

ÖZELLİK | Property 4

Rasyonel ifadeler basamak halinde ise işlem öncelik sırasına dikkat edilir. İlk önce çarpma veya bölme, sonra toplama veya çıkarma işlemi yapılır.

If rational expressions are in the form of step wise, the order of operation is followed firstly multiplication, division, addition and subtraction respectively.

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

2. $2 + \frac{1}{2 - \frac{1}{2}} = ?$ — $\frac{8}{3}$

3. $\frac{1}{1 - \frac{2}{3 + \frac{1}{2}}} = ?$ — $\frac{7}{3}$

4. $\frac{2 + \frac{2 - \frac{2}{3}}{3}}{4} = ?$ — $\frac{11}{18}$

5. $3 - \frac{6 - \frac{1 + \frac{1}{2}}{4}}{3} = ?$ — $\frac{9}{8}$

6. $2 - \frac{2 - \frac{1}{2}}{1 + \frac{1}{3}} = ?$ — $\frac{7}{8}$

7. $1 - \frac{1 + \frac{1 - \frac{1}{2}}{3}}{4} = ?$ — $\frac{17}{24}$

8. $3 - \frac{1 + \frac{3}{4}}{1 - \frac{1}{2}} = ?$ — $-\frac{1}{2}$

ÖZELLİK | Property 5

Sonsuz İfadeler | Infinive Fractions

$$a+\cfrac{b}{a+\cfrac{b}{a+\cfrac{b}{a+\ddots}}} = x \text{ olur } (is\ true)$$

x denirse *(if we say x)*

Örnek *(Example)*

$8+\cfrac{9}{8+\cfrac{9}{8+\cfrac{9}{8+\ddots}}}$ denklemi *(The* $8+\cfrac{9}{8+\cfrac{9}{8+\cfrac{9}{8+\ddots}}}$ *equation)*

$8+\frac{9}{x} = x$ haline getirilerek çözülür.

$(8+\frac{9}{x} = x$ then the equation is solved by simplifying it)

1. $4+\cfrac{4+\cfrac{4+\ddots}{5}}{5} = ?$ — 5

2. $7+\cfrac{8}{7+\cfrac{8}{7+\cfrac{8}{7+\ddots}}} = ?$ — 8

3. $1+\cfrac{1+\cfrac{1+\ddots}{3}}{3} = ?$ — $\frac{3}{2}$

4. $2+\cfrac{8}{2+\cfrac{8}{2+\cfrac{8}{2+\ddots}}} = ?$ — 4

ÖZELLİK | Property 6

Ondalıklı Sayılar

Paydası 10'un pozitif sayı kuvveti olan rasyonel sayılara ondalıklı sayı denir.

$\frac{a}{b}$ rasyonel sayısında a'nın b'ye bölünmesiyle elde edilen bölüme ondalık açılım denir.

Decimal Numbers

Decimal numbers are another way of writing fractions and mixed numbers.
All numbers to the left of decimal point are whole numbers.
All numbers to the right of the decimal point are fractions with denominators of only powers of 10 notation.

- $\frac{a}{10^n} = 0,\underbrace{0000.....}_{\text{n tane } (times)}a$
- $\frac{a}{10} = 0,a$ $\quad a,b = \frac{ab}{10} = a+\frac{b}{10}$
- $\frac{a}{100} = 0,0a$ $\quad a,bc = \frac{abc}{100} = a+\frac{bc}{100}$

$0,x = 0,x0 = 0,x00 = ...$

Aşağıdaki sayıları ondalıklı sayı haline çeviriniz.

Convert the number below to the decimal number.

1. $\frac{1}{2} = ?$ — 0,5

2. $\frac{3}{4} = ?$ — 0,75

3. $\frac{4}{25} = ?$ — 0,16

4. $\frac{3}{5} = ?$ — 0,6

5. $\frac{7}{125} = ?$ — 0,056

6. $\frac{3}{8} = ?$ — 0,375

7. $\frac{13}{4} = ?$ — 3,25

8. $\frac{17}{8} = ?$ — 2,125

RASYONEL SAYILAR

ÖZELLİK | Property 7

- **Ondalık Sayılarda Toplama ve Çıkarma İşlemi**
  Adding and Subtracting Decimals

  Ondalıklı sayılarda toplama ve çıkarma işlemi yapılırken virgüller alt alta gelecek şekilde yazılarak işlem yapılır.

  To add or subtract decimals: Write in columns with decimal points aligned. Insert zeros on the right if necessory. Add or subtract. Align the decimal pant in the answer.

- **Ondalık Sayılarda Çarpma İşlemi**
  Multiplying Decimals

  Çarpma işlemi virgüller yokmuş gibi yapılıp virgülden sonraki basamak sayısı kadar virgül kaydırılır.

  Multiply the numbers as if they were whole numbers. Count the number of decimal places in each factor. The total of the decimal places is the number of decimal places in the product. Insert zeros on the left if necessary

- **Ondalık Sayılarda Bölme İşlemi**
  Dividing Decimals

  Bölme işleminde ifade 10'un uygun kuvveti ile genişletilerek virgülden kurtarılır.

  If the divisor is not a whole number, move the decimal point in both the divisor and dividend to the right as many places as necessary to make the divisor a whole number. Place the decimal point in the quotient above the decimal point in the dividend.

1. 0,5 + 7,2 = ?

7,7

2. 3,2 + 5,7 = ?

8,9

3. 2,73 + 35,8 = ?

38,53

4. 25,24 + 7,48 = ?

32,72

5. 2,7 – 1,92 = ?

0,78

6. 14,8 – 10,9 = ?

3,9

7. 3,2 · 2,7 = ?

8,64

8. 1,2 · 3,05 = ?

3,66

9. 2,3 + 3,1 = ?

5,4

10. 23,09 · 0,1 = ?

2,309

11. 3,27 · 2,4 = ?

7,848

12. (2,9 + 3,4) · 1,2 = ?

7,56

13. (12,1 – 2,1) · (32,45) = ?

324,5

14. (2 + 0,43) : (3 – 2,55) = ?

$\frac{27}{5}$

15. $(6{,}4 \cdot 2{,}5) - (2{,}15) = ?$ — 13,85

16. $(0{,}7 \cdot 0{,}3) + (1{,}4 \cdot 0{,}9) = ?$ — 1,47

17. $\frac{0{,}0028}{0{,}007} = ?$ — $\frac{2}{5}$

18. $\frac{0{,}009}{0{,}081} = ?$ — $\frac{1}{9}$

19. $\frac{0{,}042}{0{,}007} = ?$ — 6

20. $\frac{2{,}1}{0{,}07} = ?$ — 30

21. $\frac{0{,}39}{1{,}3} + \frac{0{,}2}{0{,}05} = ?$ — 4,3

22. $\frac{0{,}18}{0{,}06} + \frac{0{,}05}{0{,}20} = ?$ — $\frac{13}{4}$

23. $\frac{0{,}4}{0{,}04} + \frac{0{,}06}{0{,}03} + \frac{6}{0{,}6} = ?$ — 22

24. $\frac{6{,}4}{1{,}6} - \frac{12}{0{,}6} + \frac{0{,}16}{0{,}02} = ?$ — −8

25. $\frac{0{,}04}{0{,}012} \cdot \frac{0{,}0036}{0{,}008} = ?$ — $\frac{3}{2}$

26. $\frac{0{,}027}{0{,}0008} \cdot \frac{0{,}04}{0{,}03} = ?$ — 45

27. $\frac{0{,}006}{0{,}064} : \frac{0{,}072}{1{,}6} = ?$ — $\frac{25}{12}$

28. $\frac{2{,}42}{0{,}8} : \frac{0{,}11}{0{,}16} = ?$ — $\frac{22}{5}$

29. $\frac{0{,}018}{0{,}01} : \frac{0{,}09}{0{,}2} = ?$ — 4

30. $\frac{0{,}0xy}{0{,}00xy} + \frac{ab}{0{,}ab} = ?$ — 110

RASYONEL SAYILAR

ÖZELLİK | Property 8

Devirli Ondalık Sayılar

Bir rasyonel sayı ondalıklı sayı biçiminde yazıldığında sayının ondalık kısmındaki rakamlar belli bir kurala göre tekrar ediyorsa bu sayıya devirli ondalıklı sayı denir ve tekrarlanan kısmın üzeri çizilir.

Repeating Periodical Decimals

Every rational number either as a terminating or as a repeating periodically decimal is written in the form of a decimal number and the repeated decimals by the drawing a line segment over the digits which are repeated.

$$0,\overline{x} = 0,xxx...$$

$$x,y\overline{zt} = x,yztztzt...$$

Devirli Ondalıklı Sayının Rasyonel Sayıya Dönüştürülmesi

Changing of Repeating Periodical Decimal Number to Rational Number

$$\frac{\text{Sayının tamamı} - \text{Devretmeyen kısım}}{\text{Virgülden sonra devreden rakam sayısı kadar 9 devretmeyen rakam sayısı kadar 0 yazılır.}}$$

$$\frac{\textit{The whole of the number} - \textit{Non-repeating part}}{\textit{After the decimal point as many nines as the number of repeating digits and as many zeros as the number of non-repeating digits are written.}}$$

$$ab,\overline{cde} = \frac{abcde - abc}{990}$$

$$= ab + \frac{cde - c}{990}$$

Devirli ondalıklı sayıda devreden rakam sadece 9 ise 9'un solundaki ilk rakam sayısal değeri bakımından 1 artırılıp 9 atılır.

If the repeating numer is only 9 at repeating decimal number, the first number at the left of 9 is increased 1 in numerical value and 9 is erased.

$$0,\overline{9} = 1$$

$$3,4\overline{9} = 3,5$$

1. $\frac{1}{3} = ?$ $0,\overline{3}$

2. $0,44444... = ?$ $\frac{4}{9}$

3. $3,\overline{7} = ?$ $\frac{34}{9}$

4. $0,\overline{15} = ?$ $\frac{15}{99}$

5. $1,0\overline{2} = ?$ $1\frac{1}{45}$

6. $2,\overline{15} = ?$ $2\frac{5}{33}$

7. $0,\overline{372} = ?$ $\frac{124}{333}$

8. $3,0\overline{42} = ?$ $3\frac{7}{165}$

9. $12,3\overline{5} = ?$ $12\frac{16}{45}$

10. $0,12\overline{13} = ?$ $\frac{1201}{9900}$

11. $2,\overline{612} = ?$ $2\frac{68}{111}$

12. $2,3\overline{12} = ?$ — $2\frac{103}{330}$

13. $26,\overline{45} = ?$ — $26\frac{5}{11}$

14. $7,0\overline{12} = ?$ — $7\frac{2}{165}$

15. $0,\overline{2} + 0,\overline{3} = ?$ — $\frac{5}{9}$

16. $2,\overline{1} + 3,\overline{4} = ?$ — $5\frac{5}{9}$

17. $1,\overline{3} - 0,\overline{4} = ?$ — $\frac{8}{9}$

18. $12,0\overline{7} - 1,6\overline{1} = ?$ — $10\frac{7}{15}$

19. $2,8\overline{7} + 24,0\overline{1} = ?$ — $26\frac{8}{9}$

20. $1,245454545... = ?$ — $\frac{137}{110}$

21. $2,\overline{45} + 3,\overline{54} = ?$ — 6

22. $0,6\overline{45} + 0,3\overline{54} = ?$ — 1

23. $\frac{0,2\overline{4} + 2,0\overline{4}}{0,0\overline{8}} = ?$ — $\frac{103}{4}$

24. $\frac{2 + 1,\overline{7}}{0,\overline{6} - 0,\overline{4}} = ?$ — 17

25. $\frac{0,1\overline{4} + 0,\overline{2}}{1,\overline{4} - 1,\overline{2}} = ?$ — $\frac{33}{20}$

26. $\frac{(1,\overline{1} + 2,\overline{2} + 3,\overline{3})}{4,\overline{4}} = ?$ — $\frac{3}{2}$

27. $\frac{64}{45} = 1,4\overline{a}$
$\Rightarrow a = ?$ — 2

ÖZELLİK | Property 9

Rasyonel Sayılarda Sıralama
Sorting Rational Numbers

- Verilen rasyonel sayılar uygun sayılarla genişletilerek pay veya paydası eşitlenir.

  Paydaları eşit ise payı en büyük olan büyüktür.

  Payları eşit ise paydası en küçük olan en büyüktür.

The numerator or the denominate is made equal by expanding the given rational numbers with suitable numbers.

If the denominators are equal, the number with the biggest numerator is bigger.

If the numerators are equal, the number with the smallest denominator is bigger.

$\frac{1}{5} < \frac{3}{5} < \frac{4}{5}$, $\frac{2}{7} > \frac{2}{9} > \frac{2}{11}$

- Pay ile payda arasındaki fark sabitse payı büyük olan sayı 1'e daha yakındır.

If the difference between the numerator and the denominator are equal, then the number with larger numerator is closer to 1.

$a = \frac{13}{11}$ $b = \frac{15}{13}$ $c = \frac{17}{15}$

$a = 1 + \frac{2}{11}$ $b = 1 + \frac{2}{13}$ $c = 1 + \frac{2}{15}$

$c < b < a$

$a = \frac{11}{13}$ $b = \frac{13}{15}$ $c = \frac{15}{17}$

$a = 1 - \frac{2}{13}$ $b = 1 - \frac{2}{15}$ $c = 1 - \frac{2}{17}$

$a < b < c$

- Negatif rasyonel sayılarda sıralama yapılıyor ise sayılar pozitif gibi düşünülerek sıralama yapılır ve bulunan sıralamanın tam tersi alınır.

If negative rational numbers are being ordered, they are ordered as if they were positive numbers, and then the obtained sorting is reversed.

1. $a = \frac{3}{7}$ $b = \frac{2}{7}$ $c = \frac{6}{7}$

$\Rightarrow ? < ? < ?$

$b < a < c$

2. $a = -\frac{8}{11}$ $b = -\frac{4}{11}$ $c = -\frac{7}{11}$

$\Rightarrow ? < ? < ?$

$a < c < b$

3. $a = \frac{7}{9}$ $b = \frac{7}{12}$ $c = \frac{7}{10}$

$\Rightarrow ? < ? < ?$

$b < c < a$

4. $a = -\frac{5}{6}$ $b = -\frac{5}{12}$ $c = -\frac{5}{8}$

$\Rightarrow ? < ? < ?$

$a < c < b$

5. $a = \frac{5}{6}$ $b = \frac{3}{4}$ $c = \frac{7}{12}$

$\Rightarrow ? < ? < ?$

$c < b < a$

6. $a = \frac{1}{2}$ $b = \frac{2}{5}$ $c = \frac{3}{7}$

$\Rightarrow ? < ? < ?$

$b < c < a$

7. $a = \frac{3}{4}$ $b = \frac{1}{2}$ $c = \frac{4}{5}$

$\Rightarrow ? < ? < ?$

$b < a < c$

8. $x=\frac{1}{12}$ $y=\frac{4}{11}$ $z=\frac{2}{9}$

$\Rightarrow ? < ? < ?$

$x<z<y$

9. $a=\frac{3}{8}$ $b=\frac{15}{17}$ $c=\frac{6}{13}$

$\Rightarrow ? < ? < ?$

$a<c<b$

10. $a=\frac{5}{7}$ $b=\frac{7}{9}$ $c=\frac{3}{11}$

$\Rightarrow ? < ? < ?$

$c<a<b$

11. $a=\frac{17}{14}$ $b=\frac{23}{20}$ $c=\frac{20}{17}$

$\Rightarrow ? < ? < ?$

$b<c<a$

12. $a=-\frac{39}{34}$ $b=-\frac{101}{96}$ $c=-\frac{73}{68}$

$\Rightarrow ? < ? < ?$

$a<c<b$

13. $a=\frac{2002}{2001}$ $b=\frac{1996}{1995}$ $c=\frac{1008}{1007}$

$\Rightarrow ? < ? < ?$

$a<b<c$

14. $a=\frac{13}{14}$ $b=\frac{108}{109}$ $c=\frac{125}{126}$

$\Rightarrow ? < ? < ?$

$a<b<c$

15. $a=-\frac{1997}{1998}$ $b=-\frac{191}{192}$ $c=-\frac{87}{88}$

$\Rightarrow ? < ? < ?$

$a<b<c$

16. $a=-\frac{121}{124}$ $b=-\frac{1001}{1004}$ $c=-\frac{355}{358}$

$\Rightarrow ? < ? < ?$

$b<c<a$

17. $x < 0$

$a=\frac{x}{8}$ $b=-\frac{x}{12}$ $c=\frac{x}{14}$

$\Rightarrow ? < ? < ?$

$a<c<b$

18. $a < 0 < b < c$

$x=\frac{a}{c}$ $y=\frac{c}{b}$ $z=\frac{a}{b}$

$\Rightarrow ? < ? < ?$

$z<x<y$

19. $x < y < 0 < z$

$a=-\frac{x}{7}$ $b=-\frac{y}{7}$ $c=-\frac{z}{7}$

$\Rightarrow ? < ? < ?$

$c<b<a$

RASYONEL SAYILAR

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

1. $\frac{2}{3}+\frac{22}{33}+\frac{222}{333}=?$

2

2. $\frac{2}{7}+\frac{3}{11}+\frac{5}{13}=x$

$\Rightarrow \frac{3}{7}+\frac{5}{11}+\frac{16}{13}$

toplamının x cinsinden ifadesi nedir?

What is the sum of $\frac{3}{7}+\frac{5}{11}+\frac{16}{13}$ *in terms of x?*

$4-2x$

3. $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=3$

$\Rightarrow \frac{2x+1}{x}+\frac{3y+1}{y}-\frac{4z-1}{z}=?$

4

4. $x, y \in R$

$\frac{2x-3y}{y-4}=0$

$\Rightarrow$ x kaç olamaz?

can not be the value of "x"?

6

5. $a = 7,38\overline{4}$

$b = 7,3\overline{84}$

$c = 7,\overline{384}$

$d = 7,384$

$\Rightarrow ? < ? < ? < ?$

$d < c < a < b$

6. $x, y \in Z$

$\frac{1}{x-3}+\frac{1}{x+y-4}=1$

$\Rightarrow x+y=?$

6

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

$a+\frac{1}{b+\frac{1}{c}}=\frac{15}{4}$

$\Rightarrow a+b+c=?$

7

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

$\frac{12}{5}$

PUZA YAYINLARI

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

9. $x \in Z^+$

$0,7\overline{9} \cdot x \in Z^+$

$\Rightarrow \min(x) = ?$

5

10. $\left(1+\frac{1}{2}\right)\cdot\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{4}\right)\cdot \ldots \cdot\left(1+\frac{1}{a}\right) = 10$

$\Rightarrow a = ?$

19

11. $x = 0,52 + 0,052 + 0,0052 + \ldots$

$y = \frac{2}{10^2} + \frac{2}{10^3} + \frac{2}{10^4} + \ldots$

$\Rightarrow x + y = ?$

0,6

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

$x + \frac{y}{11} = 18,\overline{27}$

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

21

13. $\dfrac{1901\frac{17}{6} - 1900\frac{5}{6}}{2021\frac{2}{9} - 2023\frac{20}{9}} = ?$

$-\frac{3}{4}$

14. $\frac{x}{y} = \frac{2}{3}$

$a = 0,\overline{xy}$

$b = 0,\overline{yx}$

$\Rightarrow \min(a - b) = ?$

$-\frac{3}{11}$

15. $\dfrac{\frac{4}{7} - \frac{3}{8} + \frac{15}{13}}{\frac{12}{28} - \frac{9}{32} + \frac{45}{52}} = ?$

$\frac{4}{3}$

16. $\left(1-\frac{1}{16}\right)\cdot\left(1-\frac{1}{25}\right)\cdot\left(1-\frac{1}{36}\right)\cdot \ldots \cdot\left(1-\frac{1}{3600}\right) = ?$

$\frac{61}{80}$

1. $\frac{2}{3}-\frac{1}{2}:\frac{3}{4}-\frac{1}{4}=?$

A) $-\frac{1}{36}$ B) $-\frac{1}{18}$ C) $-\frac{1}{12}$ D) $-\frac{1}{6}$ E) $-\frac{1}{4}$

2. $\left(\frac{7}{5}+\frac{3}{2}\right)-\left(\frac{7}{5}+\frac{5}{2}\right)=?$

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

3. $\left(\frac{1}{3}+\frac{1}{2}:\frac{3}{4}\right)\cdot\frac{2}{7}+\frac{5}{7}=?$

A) 0 B) 1 C) 2 D) $\frac{6}{7}$ E) $\frac{9}{7}$

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

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

5. $1+\frac{1+\frac{1}{2}}{1+\frac{1}{3}}=?$

A) $\frac{11}{6}$ B) $\frac{17}{8}$ C) $\frac{3}{2}$ D) $\frac{1}{2}$ E) $\frac{1}{6}$

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

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

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

A) 0 B) -1 C) $-\frac{32}{21}$ D) $-\frac{32}{7}$ E) $-\frac{36}{7}$

8. $\frac{3}{2}+\frac{4}{6}-\frac{5}{9}+\frac{1}{4}=?$

A) $\frac{67}{36}$ B) $\frac{11}{6}$ C) $\frac{65}{36}$ D) $\frac{16}{9}$ E) $\frac{7}{4}$

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

A) 1 B) 6 C) 12 D) 14 E) 16

10. $\left[\left(-\frac{1}{3}\right)+(-2)\cdot\left(-\frac{1}{5}\right)\right]:\frac{2}{5}-1=?$

A) -1 B) $-\frac{5}{6}$ C) $-\frac{1}{2}$ D) $-\frac{1}{3}$ E) $-\frac{1}{9}$

11. $\dfrac{2-\frac{3}{2-\frac{1}{5}}}{4-\frac{10}{3}}=?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

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

A) $\frac{5}{3}$ B) 2 C) $\frac{7}{3}$ D) $\frac{8}{3}$ E) 3

13. $\dfrac{\frac{2}{7}}{3}-\dfrac{3}{1-\frac{5}{\frac{7}{2}}}=?$

A) $-\frac{10}{7}$ B) 0 C) $\frac{10}{7}$ D) $\frac{55}{7}$ E) $\frac{60}{7}$

14. $\dfrac{\left(\frac{2}{3}+11\right)-\left(11-\frac{7}{3}\right)}{\left(5-\frac{7}{2}\right)+\left(\frac{1}{2}-1\right)}=?$

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

15. $\left(\frac{3}{13}-\frac{2}{7}+\frac{5}{11}\right)-\left(\frac{5}{7}-\frac{6}{11}-\frac{10}{13}\right)=?$

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

16. $1+\dfrac{1}{1-\frac{1}{1+\frac{1}{3}}}=?$

A) $\frac{7}{4}$ B) $\frac{11}{3}$ C) 5 D) $\frac{11}{2}$ E) $\frac{29}{4}$

1. $\frac{3}{5}+\frac{1}{2}:\left(\frac{5}{4}\cdot\frac{1}{5}-\frac{1}{5}\right)-9=?$

A) $\frac{7}{5}$ B) $\frac{8}{5}$ C) $\frac{9}{5}$ D) $\frac{11}{5}$ E) $\frac{13}{5}$

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

A) – 19,4 B) – 18,3 C) – 17,2 D) – 15,2 E) – 13,4

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

A) $\frac{9}{2}$ B) 4 C) $\frac{7}{2}$ D) 3 E) $\frac{5}{2}$

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

A) $\frac{3}{5}$ B) $\frac{7}{9}$ C) $\frac{2}{3}$ D) $\frac{13}{11}$ E) $\frac{15}{13}$

5. $\frac{1}{2}+\frac{7}{5}\cdot\left(\frac{4}{3}:\frac{5}{3}+\frac{21}{5}\right)=?$

A) $\frac{17}{30}$ B) 1 C) 3 D) $\frac{15}{2}$ E) 8

6. $\left(\frac{\frac{21}{4}}{7}+\frac{6}{\frac{8}{3}}\right)=?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) 2 D) 3 E) 6

7. $\left(\frac{3}{2-\frac{7}{5}}+\frac{\frac{7}{3}-1}{4}\right):\frac{2}{3}=?$

A) $\frac{17}{2}$ B) 8 C) $\frac{15}{2}$ D) 7 E) $\frac{13}{2}$

8. $\frac{2-\frac{\frac{6}{5}}{3}}{1+\frac{7}{\frac{14}{3}}}=?$

A) $\frac{16}{25}$ B) $\frac{4}{25}$ C) 2 D) 4 E) 6

9. $\dfrac{3-\frac{5}{3}}{1-\frac{\frac{1}{4}}{5-\frac{1}{2}}} = ?$

A) $\frac{1}{3}$ B) 1 C) $\frac{5}{3}$ D) $\frac{34}{27}$ E) $\frac{24}{17}$

10. $A = 1-\frac{2}{3}:\frac{8}{3}$, $B = \left(2-\frac{2}{3}\right)\cdot\frac{\frac{2}{5}}{\frac{8}{15}}$ $\Rightarrow A-B+\frac{3}{4} = ?$

A) $-\frac{16}{9}$ B) $-\frac{8}{3}$ C) $\frac{2}{9}$ D) $\frac{1}{2}$ E) $\frac{16}{9}$

11. $3\frac{1}{2}-3\cdot\frac{1}{2} = ?$

A) 0 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

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

A) $\frac{3}{7}$ B) $\frac{9}{7}$ C) 2 D) 3 E) 4

13. $999\frac{1}{2}-998\frac{1}{3} = ?$

A) $\frac{2}{3}$ B) $\frac{5}{6}$ C) 1 D) $\frac{7}{6}$ E) $\frac{4}{3}$

14. $\dfrac{1\frac{1}{2}+2\frac{1}{3}}{2+2:\frac{1}{2}-5} = ?$

A) $\frac{23}{6}$ B) $\frac{23}{18}$ C) $\frac{7}{6}$ D) $\frac{7}{18}$ E) $\frac{21}{16}$

15. $\dfrac{4\frac{5}{12}-2\frac{17}{12}}{1-\frac{3}{4}} = ?$

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

16. $\dfrac{2\frac{3}{4}-2\frac{3}{2}+\frac{1}{4}}{3:\frac{3}{2}-\frac{5}{2}} = ?$

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

1. $\frac{0,0034}{0,17} = ?$

A) 100 B) 25 C) 0,4 D) 0,02 E) 0,01

2. $(3 + 0,42) : (2 - 0,86) = ?$

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

3. $(2 - 0,31) : (1 - 0,87) = ?$

A) 6 B) 8 C) 12 D) 13 E) 15

4. $(1,376 + 0,624) \cdot (2,92 + 0,08) = ?$

A) 0 B) 1 C) 2 D) 6 E) 9

5. $\frac{0,2}{0,02} + \frac{0,08}{0,04} + \frac{3}{0,3} = ?$

A) 13 B) 22 C) 50 D) 112 E) 130

6. $\frac{0,1 + 0,64 + 0,26}{1 + \frac{3}{5}} = ?$

A) 0 B) $\frac{5}{8}$ C) $\frac{8}{5}$ D) $\frac{5}{4}$ E) $\frac{16}{7}$

7. $\frac{0,064}{0,128} + \frac{4,2}{0,63} = ?$

A) $\frac{1}{6}$ B) 1 C) $\frac{7}{6}$ D) $\frac{43}{6}$ E) $\frac{47}{6}$

8. $\frac{0,02}{0,14} + \frac{4,5}{4,2} - \frac{0,6}{2,8} = ?$

A) -1 B) 0,3 C) 1 D) $\frac{16}{5}$ E) 10

9. $\frac{0,2456}{0,1}+\frac{0,1088}{0,2}=?$

A) 0,3 B) $\frac{3}{2}$ C) 3 D) 30 E) 300

10. $\frac{0,04}{0,002}+\frac{0,21}{0,07}\cdot\frac{0,09}{2,7}=?$

A) 20 B) 20,1 C) 21 D) 20,5 E) 30

11. $\frac{0,1}{0,01}+\frac{0,04}{0,02}+\frac{2}{0,2}=?$

A) 11 B) 15 C) 16 D) 22 E) 24

12. $\frac{2,2}{0,11}-\frac{4,2}{0,21}+\frac{1,5}{0,03}=?$

A) – 230 B) – 130 C) 20 D) 50 E) 230

13. $\frac{0,2}{0,02}+\frac{0,06}{0,03}+\frac{5}{0,5}=?$

A) 22 B) 20 C) 18 D) 12 E) 8

14. $\frac{5,1}{1,7}-\frac{16}{0,8}+\frac{9,2}{0,23}=?$

A) 18 B) 21 C) 23 D) 25 E) 27

15. $\frac{2,8}{0,07}-\frac{0,16}{0,02}+\frac{20}{0,4}=?$

A) 80 B) 82 C) 90 D) 98 E) 100

16. $\frac{0,0036-0,0015}{0,0001-0,00003}=?$

A) 30 B) 21 C) 12 D) 6 E) 3

1. $\dfrac{0,2+\dfrac{4}{5}}{2,3-2,05}=?$

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

2. $\dfrac{\dfrac{0,3}{\frac{4}{5}}-\dfrac{\frac{3}{5}}{0,4}+0,1}{}=?$

A) $-\frac{41}{40}$ B) $-\frac{19}{40}$ C) $\frac{3}{8}$ D) $\frac{19}{40}$ E) $\frac{41}{40}$

3. $\dfrac{\dfrac{4}{0,3}-12}{0,42+0,78}=?$

A) 1 B) $\frac{10}{9}$ C) $\frac{8}{5}$ D) 2 E) $\frac{16}{5}$

4. $0,15-\left(0,7-\dfrac{3}{5}\right)=?$

A) $-\frac{1}{5}$ B) 0 C) $\frac{1}{50}$ D) $\frac{1}{20}$ E) $\frac{1}{5}$

5. $\dfrac{\dfrac{5}{0,4}+\dfrac{0,6}{0,08}}{0,\overline{5}}=?$

A) $\frac{55}{72}$ B) $\frac{99}{40}$ C) $\frac{50}{9}$ D) 18 E) 36

6. $\dfrac{\dfrac{4}{0,25}+\dfrac{6}{0,15}}{0,5}=?$

A) 13 B) 23 C) 56 D) 112 E) 120

7. $\dfrac{(0,5)+\dfrac{3}{4}-\dfrac{5}{12}}{(2,4)\cdot(0,5)}=?$

A) $\frac{6}{5}$ B) $\frac{5}{6}$ C) $\frac{25}{36}$ D) 1 E) $\frac{36}{25}$

8. $\dfrac{\dfrac{1}{0,2}-\dfrac{2}{0,4}+\dfrac{4}{0,8}}{\dfrac{2}{0,4}-\dfrac{3}{0,5}+\dfrac{4}{0,8}}=?$

A) 0,5 B) 0,75 C) 1,25 D) 1,75 E) 2,25

9.
$$\begin{array}{r} 0,x \\ 0,yy \\ +\ z,zzz \\ \hline a,964 \end{array}$$

$\Rightarrow x - y + z - a = ?$

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

10. $0,x4 + 1,x2 + 0,11 = 2,17$

$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

11. $\frac{xy}{x,y} + \frac{x,yz}{0,0xyz} = ?$

A) 11 B) 101 C) 110 D) 111 E) 1010

12. $\frac{0,bc}{0,0bc} + \frac{bc}{0,bc} - \frac{bc0}{b,c} = ?$

A) 0,1 B) 1 C) 10 D) 110 E) 190

13. $(x,2) - [(x,y) - (2,y)] = ?$

A) $-1,8$ B) $-0,8$ C) 0 D) 1,8 E) 2,2

14. $2 - \frac{444 - \frac{4}{0,04}}{\frac{4}{0,04} - 444} = ?$

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

15. $0,6 + 0,06 + 0,006 + \ldots = ?$

A) $\frac{2}{3}$ B) $\frac{7}{9}$ C) $\frac{8}{9}$ D) 1 E) $\frac{3}{2}$

16. $1,4999\ldots = ?$

A) $\frac{3}{2}$ B) 2 C) $\frac{5}{2}$ D) $\frac{17}{10}$ E) 4

1. 2,1666..... = ?

A) $\frac{25}{12}$ B) $\frac{13}{6}$ C) $\frac{9}{4}$ D) $\frac{7}{3}$ E) $\frac{29}{12}$

2. 0,824242424... = ?

A) $\frac{275}{330}$ B) $\frac{271}{330}$ C) $\frac{130}{165}$ D) $\frac{134}{165}$ E) $\frac{136}{165}$

3. $0,\overline{7} + 0,1\overline{2}$ = ?

A) 0,5 B) 0,6 C) 0,7 D) 0,8 E) 0,9

4. $0,5\overline{3} + 0,2\overline{6}$ = ?

A) 0,7 B) 0,8 C) 0,9 D) 1 E) 1,1

5. $0,6\overline{4} + 0,3\overline{5}$ = ?

A) 1 B) 0,9 C) 0,8 D) 0,7 E) 0,6

6. $0,\overline{3} + 0,0\overline{2} + 0,00\overline{4}$ = ?

A) $0,35\overline{8}$ B) 0,369 C) 0,36 D) $0,\overline{4}$ E) 1

7. $0,6 \cdot (2 - 1,1\overline{6})$ = ?

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

8. $\frac{0,54}{\frac{9}{5}} + (0,\overline{4} + 0,\overline{3}) \cdot 0,9$ = ?

A) 1 B) $\frac{6}{5}$ C) $\frac{8}{5}$ D) 2 E) 3

9. $\frac{0,\overline{2}}{0,0\overline{4}} - \frac{0,\overline{5}}{1,\overline{6}} = ?$

A) $\frac{14}{9}$ B) 2 C) $\frac{14}{3}$ D) 4 E) $\frac{75}{16}$

10. $\frac{0,1\overline{8}+1,\overline{4}}{2,\overline{3}-1,\overline{4}} = ?$

A) $\frac{141}{80}$ B) $\frac{143}{80}$ C) $\frac{147}{80}$ D) $\frac{15}{8}$ E) 2

11. $\frac{0,\overline{4}+2,4\overline{5}}{1,3\overline{6}-0,4\overline{6}} = ?$

A) $\frac{28}{9}$ B) $\frac{29}{9}$ C) $\frac{29}{8}$ D) $\frac{7}{2}$ E) 4

12. $x = 1,333...$
$y = 2,121212...$
$\Rightarrow x : y = ?$

A) $\frac{2}{5}$ B) $\frac{4}{7}$ C) $\frac{22}{35}$ D) $\frac{27}{35}$ E) 5

13. $m = 0,\overline{3}$
$n = 0,\overline{4}$
$\Rightarrow \frac{1}{m} + \frac{1}{n} = ?$

A) $\frac{7}{9}$ B) $\frac{18}{9}$ C) 4 D) 5 E) $\frac{21}{4}$

14. $y = x + \frac{1,\overline{3}}{0,\overline{8}}$
$y \in Z$
$\Rightarrow$ x aşağıdakilerden hangisi olabilir?
Which one of the following can be x?

A) 5,25 B) 6,5 C) 7,75 D) 8,2 E) 9,6

15. $\frac{73}{30} = 2,4\overline{a}$
$\Rightarrow a = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

16. $\frac{79}{45} = 1,7\overline{x}$
$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 8

1. $a = \dfrac{3}{1-\frac{2}{3}}$ $b = \dfrac{4}{2+\frac{1}{2}}$ $c = \dfrac{2-\frac{1}{2}}{4}$

$\Rightarrow ? < ? < ?$

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

2. $a = \dfrac{37}{30}$ $b = -\dfrac{71}{32}$ $c = -\dfrac{135}{43}$

$\Rightarrow ? < ? < ?$

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

3. $a = \dfrac{2}{3}$ $b = \dfrac{7}{15}$ $c = \dfrac{10}{21}$

$\Rightarrow ? < ? < ?$

A) $b < c < a$ B) $b < c = a$ C) $c < b < a$
D) $c = b < a$ E) $a < c = b$

4. $a = -0{,}23$
$b = -0{,}235$
$c = -0{,}2035$
$\Rightarrow ? < ? < ?$

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

5. $a = \dfrac{13}{16}$, $b = \dfrac{18}{21}$, $c = \dfrac{17}{20}$ $\Rightarrow ? < ? < ?$

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

6. $a = \dfrac{100}{99}$, $b = \dfrac{1000}{999}$, $c = \dfrac{10000}{9999}$ $\Rightarrow ? < ? < ?$

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

7. $a = \dfrac{2008}{2009}$, $b = \dfrac{2009}{2010}$, $c = \dfrac{2010}{2011}$ $\Rightarrow ? < ? < ?$

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

8. $a = \dfrac{10}{11}$, $b = \dfrac{100}{101}$, $c = \dfrac{1000}{1001}$ $\Rightarrow ? < ? < ?$

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

9. $x < 0$

$a = -\frac{x}{7}$ $\quad b = -\frac{x}{11}$ $\quad c = -\frac{x}{9}$

$\Rightarrow ? < ? < ?$

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

10. $a < b < 0 < c$

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

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

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

$\frac{a}{0,11} = \frac{b}{0,7} = \frac{c}{0,53}$

$\Rightarrow ? < ? < ?$

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

12. $a = 5,74$

$b = 5,\overline{74}$

$c = 5,79\overline{6}$

$d = 5,7\overline{8}$

$\Rightarrow ? < ? < ?$

A) $d < a < b < c$ B) $d < a < c < b$
C) $a < b < c < d$ D) $a < b < d < c$
E) $b < a < c < d$

13. $\left(1+\frac{1}{2}\right)\cdot\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{4}\right)\cdot\left(1+\frac{1}{5}\right) = ?$

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

14. $\left(1+\frac{1}{2}\right)\cdot\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{4}\right)\cdot \ldots\ldots \cdot\left(1+\frac{1}{x}\right) = 10$

$\Rightarrow x = ?$

A) 18 B) 19 C) 20 D) 21 E) 22

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

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{1}{10}$ E) $\frac{9}{10}$

16. $\left(1-\frac{1}{2}\right)\cdot\left(1-\frac{1}{3}\right)\cdot\left(1-\frac{1}{4}\right)\cdot \ldots\ldots \cdot\left(1-\frac{1}{50}\right) = ?$

A) 100 B) 50 C) 25 D) $\frac{1}{50}$ E) $\frac{1}{100}$

1. $2+\cfrac{2+\cfrac{2+\cfrac{\cdots}{3}}{3}}{3}=?$

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

2. $1+\cfrac{1+\cfrac{1+\cfrac{\cdots}{x}}{x}}{x}=4$

$\Rightarrow x=?$

A) $\frac{4}{5}$ B) $\frac{3}{4}$ C) $\frac{7}{8}$ D) $\frac{4}{3}$ E) $\frac{3}{2}$

3. $1+\cfrac{6}{1+\cfrac{6}{1+\cfrac{6}{\ddots}}}=?$

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

4. $1+\cfrac{1-\cfrac{1+\cfrac{1-\cfrac{\cdots}{2}}{2}}{2}}{2}=?$

A) $\frac{8}{7}$ B) $\frac{7}{6}$ C) $\frac{6}{5}$ D) $\frac{5}{4}$ E) $\frac{4}{3}$

5. $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=2$

$\Rightarrow \frac{2a+1}{a}+\frac{3b+1}{b}+\frac{4c+1}{c}=?$

A) 10 B) 11 C) 12 D) 13 E) 14

6. $\frac{5}{8}+\frac{7}{17}+\frac{3}{11}=x$

$\Rightarrow \frac{3}{8}+\frac{10}{17}+\frac{8}{11}=?$

A) 3 B) $3-x$ C) $3+x$ D) $x-3$ E) $3x$

7. $x=\frac{4}{7}+\frac{5}{11}+\frac{6}{13}$

$\Rightarrow \frac{6}{7}+1\frac{1}{11}+1\frac{1}{13}=?$

A) $6-2x$ B) $6+2x$ C) $2x-6$ D) $2x+6$ E) $2x$

8. $\frac{3}{5}+\frac{12}{7}+\frac{20}{11}=x$

$\Rightarrow \frac{1}{5}+\frac{1}{7}+\frac{1}{11}=?$

A) $\frac{2-x}{5}$ B) $\frac{5+x}{2}$ C) $5+2x$ D) $5-2x$ E) $\frac{5-x}{2}$

9. $0,7\overline{43} + 0,2\overline{56} = ?$

A) 0,89 B) 0,9 C) 0,98 D) 0,987 E) 1

10. $x = 0,\overline{2}$ $y = 0,\overline{5}$

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

A) $\frac{7}{9}$ B) $\frac{18}{7}$ C) $\frac{21}{4}$ D) 7 E) $\frac{63}{10}$

11. $\frac{17}{15} = 1,1\overline{a} \Rightarrow a = ?$

A) 2 B) 3 C) 5 D) 6 E) 7

12. $x, y \in N$

$\frac{x}{y} = 0,2\overline{4}$

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

A) 41 B) 42 C) 56 D) 57 E) 58

13. $a, b \in Z$

$$a + \frac{1}{b + \frac{1}{2}} = \frac{9}{7}$$

$\Rightarrow a + b = ?$

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

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

$$a + \frac{1}{b + \frac{1}{c}} = \frac{27}{5}$$

$\Rightarrow a + b - c = ?$

A) 9 B) 5 C) 3 D) 2 E) 1

15. $a, b \in Z$

$$\frac{1}{a - 2b} + \frac{1}{b - 2} = 1$$

$\Rightarrow a \cdot b = ?$

A) 14 B) 20 C) 24 D) 36 E) 40

16. $\left(x + \frac{48}{75}\right) \in Z$

$\Rightarrow x = 2,bc = ?$

A) 2,36 B) 2,54 C) 2,48 D) 2,64 E) 2,76

1. $\frac{1}{6}+\frac{11}{66}+\frac{111}{666}+\frac{1111}{6666}=?$

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{5}{6}$ E) 1

2. $x+y+z=10$

$\Rightarrow x,yz+y,zx+z,xy=?$

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

3. $a,b\in Q$

$(a+1)+b\sqrt{2}+3\sqrt{2}=\frac{3}{2}+5\sqrt{2}$

$\Rightarrow a+b=?$

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

4. $\frac{271\frac{3}{5}+28\frac{2}{5}}{77\frac{11}{9}-18\frac{2}{9}}=?$

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

5. $\frac{0,\overline{a}+0,\overline{b}}{a,\overline{a}+b,\overline{b}}=?$

A) 0,1 B) 1,1 C) 10 D) 0,9 E) 0,99

6. $x<0$

$a=\frac{23x}{20}$ $b=\frac{43x}{40}$ $c=\frac{13x}{10}$

$\Rightarrow ?<?<?$

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

D) $b<c<a$ E) $b<a<c$

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

$a=0,\overline{xy}$ $b=0,\overline{yx}$

$\Rightarrow \min(a-b)=?$

A) $-\frac{6}{11}$ B) $-\frac{3}{11}$ C) $-\frac{1}{11}$ D) $\frac{3}{11}$ E) $\frac{6}{11}$

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

$x+\frac{y}{z}=\frac{17}{3}$

$\Rightarrow \min(x+y+z)=?$

A) 8 B) 9 C) 10 D) 11 E) 12

9. $\frac{6a-2b}{a-5}=0$

$\Rightarrow$ b aşağıdakileden hangisi olamaz?

Which one of the following can not be the value of b?

A) 3 B) 5 C) 10 D) 15 E) 20

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

$a+\frac{1}{b+\frac{1}{c}}=\frac{37}{16}$

$\Rightarrow a+b+c=?$

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

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

$\Rightarrow \frac{x-2}{x}+\frac{y-4}{y}-\frac{3z+6}{z}=?$

A) -15 B) -14 C) -13 D) -12 E) -11

12. $\frac{\frac{4}{21}+\frac{10}{33}-\frac{6}{39}}{\frac{2}{7}+\frac{5}{11}-\frac{3}{13}}=?$

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

13. $a=3,47\overline{8}$

$b=3,4\overline{78}$

$c=3,\overline{478}$

$d=3,478$

$\Rightarrow ? < ? < ? < ?$

A) $d<b<a<c$ B) $d<a<b<c$

C) $d<c<b<a$ D) $a<b<c<d$

E) $b<a<c<d$

14. $x=m+\frac{7}{8}$

$x \in Z$

$m=(a,bcd)$

$\Rightarrow b+c+d=?$

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

15. $\left(1-\frac{1}{4}\right)\cdot\left(1-\frac{1}{9}\right)\cdot\left(1-\frac{1}{16}\right)\cdot\ldots\cdot\left(1-\frac{1}{400}\right)=?$

A) $\frac{2}{5}$ B) $\frac{9}{20}$ C) $\frac{19}{40}$ D) $\frac{1}{2}$ E) $\frac{21}{40}$

16. $x, y \in Z$

$\frac{1}{x+y-6}+\frac{1}{x+3}=1$

$\Rightarrow y=?$

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

YANIT ANAHTARI | ANSWER KEY

TEST 1

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

TEST 2

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

TEST 3

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

TEST 4

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

TEST 5

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

TEST 6

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

TEST 7

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

TEST 8

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


BİRİNCİ DERECEDEN
DENKLEMLER
FIRST DEGREE EQUATIONS

BİRİNCİ DERECEDEN DENKLEMLER

ÖZELLİK | Property 1

Birinci Dereceden Denklemler

a ve b sabit olmak üzere;

ax + b = 0 şeklindeki eşitliğe birinci dereceden bir bilinmeyenli denklem denir. Denklemi sağlayan x değerine denklemin kökü, köklerden oluşan kümeye de denklemin çözüm kümesi denir.

$x = \frac{-b}{a}$ → Denklemin kökü

$\left\{\frac{-b}{a}\right\}$ → Denklemin çözüm kümesi (Ç.K.)

First Degree Equations

A linear equation in one variable has the form ax + b = 0, where a and b are constants and a ≠ 0, the value of x satisfies the exuation which is named as the root of the equation, and the set of all consisting roots of the equation are konwn as the solution set of the equation.

$x = \frac{-b}{a}$ → *The root of the equation*

$\left\{\frac{-b}{a}\right\}$ → *The smybolic representation of the solution set of the equation (SS)*

1. 2x – 8 = 4
⇒ x = ?
6

2. 3x – 8 = x + 2
⇒ x = ?
5

3. 4x – 2 – x = 5x – 10
⇒ x = ?
4

4. 5x – 2x – 7 = x – 3
⇒ x = ?
2

5. – 2 – (– 8) – 11x = 13x – 42
⇒ x = ?
2

6. 7x – 3(x – 1) + 5 = – (– 6x) + 2
⇒ x = ?
3

7. 3x – 2x + 1 = – 2x – x + 9
⇒ x = ?
2

8. 2(x – 1) – (x + 2) = 3x – 6
⇒ x = ?
1

9. 4x – 3(x + 1) = 7x – 4x + 2
⇒ x = ?
$-\frac{5}{2}$

10. 2(a – 1) + 2(a + 2) = 3a – 6
⇒ a = ?
– 8

11. 3(1 – x) + 2(3 – 2x) = 2
⇒ x = ?
1

12. 5(7 – x) + 6(x + 2) = 28
⇒ x = ?
– 19

13. – 2(x + 1) – 4(x – 3) = 3(x + 1)
⇒ x = ?
$\frac{7}{9}$

14. 6(x – 3) – 3(2x + 1) = 2x – 3
⇒ x = ?
– 9

15. 2x + 3 – 2(x – 4) = 3x – 1
⇒ x = ?
4

ÖZELLİK | Property 2

Orantı Özelliği | Law of Proportion

$$\frac{a}{b}=\frac{c}{d} \Rightarrow a \cdot d = b \cdot c$$

1. $\frac{x-1}{4}=3$
$\Rightarrow x = ?$

13

2. $\frac{6}{x+1}=2$
$\Rightarrow x = ?$

2

3. $\frac{3}{x-2}=\frac{4}{x+2}$
$\Rightarrow x = ?$

14

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

17

5. $\frac{3x+2}{4}=\frac{2x+1}{2}$
$\Rightarrow x = ?$

0

6. $\frac{5x-12}{3}=2x+3$
$\Rightarrow x = ?$

−21

7. $\frac{3x-5}{2}=4x-3$
$\Rightarrow x = ?$

$\frac{1}{5}$

8. $\frac{6x+1}{3}=\frac{5x-2}{2}$
$\Rightarrow x = ?$

$\frac{8}{3}$

9. $\frac{3x+2}{3}=\frac{6x-2}{5}$
$\Rightarrow x = ?$

$\frac{16}{3}$

10. $\frac{2x-8}{x-3}=\frac{3}{2}$
$\Rightarrow x = ?$

7

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

−3

12. $\frac{7x+5}{2x-1}=3$
$\Rightarrow x = ?$

−8

13. $\frac{4x-11}{3}=2(x-2)$
$\Rightarrow x = ?$

$\frac{1}{2}$

14. $\frac{2x+3}{4}=\frac{3x-6}{3}$
$\Rightarrow x = ?$

$\frac{11}{2}$

15. $\frac{4x-4}{2}=\frac{3x-6}{3}$
$\Rightarrow x = ?$

0

BİRİNCİ DERECEDEN DENKLEMLER

ÖZELLİK | Property 3

Rasyonel ifadelerde paydalar eşitlenir.

In rational expressions the denominators are made equal.

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

$\Rightarrow x=?$

6

2. $\frac{x-1}{3}+\frac{x+1}{4}=\frac{17}{6}$

$\Rightarrow x=?$

5

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

$\Rightarrow x=?$

7

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

$\Rightarrow x=?$

$\frac{18}{11}$

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

$\Rightarrow x=?$

12

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

$\Rightarrow x=?$

3

7. $\frac{2}{3}(x-1)+\frac{1}{2}(2x-1)=\frac{13}{6}$

$\Rightarrow x=?$

2

8. $4-\frac{2}{x}=\frac{4}{x}$

$\Rightarrow x=?$

$\frac{3}{2}$

9. $\frac{2}{5}-3\left(\frac{x}{3}-\frac{1}{5}\right)=x+3$

$\Rightarrow x=?$

-1

10. $\frac{3}{7}-5\left(\frac{x}{10}+\frac{2}{7}\right)=3$

$\Rightarrow x=?$

-8

11. $\frac{x}{x-2}+x-6=\frac{2}{x-2}$

$\Rightarrow x=?$

5

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

$\Rightarrow x=?$

3

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

$\Rightarrow x=?$

11

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

$\Rightarrow x=?$

-2

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

$\Rightarrow x=?$

2

ÖZELLİK | Property 4

Denklemlerde sadeleştirme işlemi yapılırken sadeleştirilen ifade "0" a eşitlenir. Bulunan değer çözüm kümesinin elemanıdır. Rasyonel ifadelerde paydayı sıfır yapan değer çözüm kümesinden çıkarılır.

While doing simplification in equations, the expression is made equal to zero. The value of unknown variable is the element of the solution set. In rational expressions, the value that makes the denominator exual to zero is discarded from the solution set. This root is known as extraneous root of the equation.

Örnek *(Example)*

- $\frac{(x-3)(x+5)}{x-3} = 1 \Rightarrow$ S.S. = {– 4}
- $(x-3)(x+5) = (x-3) \Rightarrow$ S.S. = {3, – 4}

1. $(x-2)(x-4) = (x-2)$
$\Rightarrow$ S.S. = ?
{2, 5}

2. $(x+1)(x-2) = (x+1)$
$\Rightarrow$ S.S. = ?
{–1, 3}

3. $x^2 - 4 = (x+2)$
$\Rightarrow$ S.S. = ?
{–2, 3}

4. $\frac{(x-3)(x+1)}{(x-3)} = 1$
$\Rightarrow$ S.S. = ?
{0}

5. $\frac{x^2-4}{x-2} = 1$
$\Rightarrow$ S.S. = ?
{–1}

6. $(x-3)(x-4) = (2x-6)$
$\Rightarrow$ S.S. = ?
{3, 6}

7. $x^2 - 9 = (x-3)$
$\Rightarrow$ S.S. = ?
{3, – 2}

8. $x^2 - 16 = x - 4$
$\Rightarrow$ S.S. = ?
{4, – 3}

9. $\frac{(x-3)(x-2)}{(x-3)} = 1$
$\Rightarrow$ S.S. = ?
Ø

10. $\frac{(x+6)(x+4)}{(x+6)} = -2$
$\Rightarrow$ S.S. = ?
Ø

11. $(x+1)(x+5) = (x+5)$
$\Rightarrow$ S.S. = ?
{– 5, 0}

12. $(x-2)(x-3) = (x-3)$
$\Rightarrow$ S.S. = ?
{3}

13. $\frac{(x-5)(x+2)}{(x+2)} = 1$
$\Rightarrow$ S.S. = ?
{6}

14. $\frac{(x-4)(x+1)}{(x+1)} = 1$
$\Rightarrow$ S.S. = ?
{5}

15. $(x^2 - 9) = (3x + 9)$
$\Rightarrow$ S.S. = ?
{– 3, 6}

BİRİNCİ DERECEDEN DENKLEMLER

ÖZELLİK | Property 5

Birinci Dereceden İki Bilinmeyenli Denklemler

$a_1, a_2, b_1, b_2, c_1, c_2$ sıfırdan farklı reel sayılar olmak üzere;

$$a_1x + b_1y = c_1$$
$$a_2x + b_2y = c_2$$

şeklinde iki bilinmeyenden oluşan sisteme iki bilinmeyenli denklem sistemi denir. Bu denklem sisteminin çözüm kümesi bulunurken genel olarak yok etme metodu kullanılır. Yok etme metodu; denklem sisteminde x veya y'den birinin katsayıları zıt işaretli olarak eşitlenip bu denklemler taraf tarafa toplanarak değişkenlerden biri yok edilir.

First Degree with Two Unknown Equation

Let $a_1, a_2, b_1, b_2, c_1, c_2$ be non-zero real numbers;

$$a_1x + b_1y = c_1$$
$$a_2x + b_2y = c_2$$

The system consisting of two unknowns is called a system of equation with two unknowns. Generally the elimination method is used to find the solution of pair of values for x and y (x, y) In the elimination method, the coefficients of x or y in the system of exuations are equalized with opposite signs, and one of the variables is eliminated by adding these equations on each side of the equal sign.

$$2x + 3y = 18$$
$$5x + 2y = 23$$

$$-2 \,/\, 2x + 3y = 18$$
$$3 \,/\, 5x + 2y = 23$$

$$-4x - 6y = -36$$
$$+\quad 15x + 6y = 69$$
$$\overline{\qquad\qquad\qquad}$$
$$11x = 33$$
$$x = 3$$

x değeri verilen herhangi bir denklemle yazılarak y değeri de bulunur.

Then, the x value is inserted in any of the equations to find the y value.

$$2x + 3y = 18$$
$$2 \cdot 3 + 3y = 18$$
$$3y = 12$$
$$y = 4$$
$$S.S. = \{(3, 4)\}$$

1. $a - b = 6$
$a + b = 14$
$\Rightarrow a = ?$

10

2. $2a - b = 12$
$a + b = 3$
$\Rightarrow b = ?$

-2

3. $2a + 3b = 17$
$a - b = 1$
$\Rightarrow a = ?$

4

4. $3a - 2b = 11$
$2a + b = 12$
$\Rightarrow b = ?$

2

5. $4x - 3y = 8$
$2x + 4y = 26$
$\Rightarrow x = ?$

5

6. $3x + 2y = 1$
$4x + 3y = 1$
$\Rightarrow x = ?$

1

7. $5x - 3y = 9$
$2x + 2y = 10$
$\Rightarrow x \cdot y = ?$

6

8. $\frac{2}{x} - \frac{3}{y} = 0$
$\frac{1}{x} + \frac{1}{y} = 5$
$\Rightarrow x = ?$

$\frac{1}{3}$

9. $\frac{2}{x} + \frac{3}{y} = 12$
$\frac{4}{x} + \frac{1}{y} = 9$
$\Rightarrow x = ?$

$\frac{2}{3}$

10. $\frac{2}{x} + \frac{3}{y} = 2$
$\frac{2}{x} + \frac{6}{y} = 3$
$\Rightarrow x = ?$

2

ÖZELLİK | Property 6

İki Lineer Denklem Eşitliği
The Equality of Two First Degree Equations

$ax + b = cx + d$ denkleminde a, b, c, d sabit ve $a \neq 0$, $c \neq 0$ dır. Çözümünde iki durum vardır.

$ax + b = cx + d$, where a, b, c, d are constants and $a \neq 0$, $c \neq 0$ we have two conditions:

- a = c ve *(and)* b = d ⇔ S.S. = R
- a = c ve *(and)* b ≠ d ⇔ S.S. = Ø

1. $2x - \{-3(2x + 1)\} = mx + 8$ S.S. = Ø
⇒ m = ? — 8

2. $4x + 3(x + 2) = mx + 9$ S.S. = Ø
⇒ m = ? — 7

3. $3(x - 2) + 4x = 7x + k$ S.S. = R
⇒ k = ? — −6

4. $-2(x - 3) - 3(x + 1) = -5x + k$ S.S. = R
⇒ k = ? — 3

5. $2x + 4y = k$ (x, y) = (1, 3)
⇒ k = ? — 14

6. $3x - y + k = 0$ (x, y) = (−2, 1)
⇒ k = ? — 7

7. $3y - 2x - k = 0$ (x, y) = (1, −3)
⇒ k = ? — −11

ÖZELLİK | Property 7

Birinci Dereceden İki Bilinmeyenli Denklem
Is First Degree Equations with Two Unknowns

$$a_1x + b_1y = c_1$$
$$a_2x + b_2y = c_2$$

denklem sisteminde üç durum vardır;
we have three possibilities;

- $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
  ⇒ denklem sisteminin çözüm kümesi sonsuz elemanlıdır. (denklemler lineer bağımlı) Doğrular çakışıktır.
  then the solution set has infinitely many solutions. The graphs are the same line (coincidence of the lines)
- $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
  ⇒ denklem sisteminin çözüm kümesi boş kümedir. Doğrular paraleldir.
  then the solution set has no solution. The graphs are two parallel lines
- $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
  ⇒ denklem sisteminin çözüm kümesi tek elemanlıdır. Doğrular tek noktada kesişir.
  then the solution set has one solution. The graphs are intersecting at a single point

1. $2x + ay = 6$
$4x - 6y = 12$ n(S.S.) = ∞
⇒ a = ? — −3

2. $2x - 4y = 6$
$x + ky = 5$ S.S. = Ø
⇒ k = ? — −2

3. $3x + 2y = 11$
$-6x + ky = 4$ S.S. = Ø
⇒ k = ? — −4

4. $a \in R^+$
$ax + 4y = 2$
$9x + ay = 7$ S.S. = Ø
⇒ a = ? — 6

5. $2x + y = 6$
$4x - ky = 12$ n(S.S.) = ∞
⇒ k = ? — −2

6. $x - 2y = 2$
$3x + ky = 6$ n(S.S.) = ∞
⇒ k = ? — −6

BİRİNCİ DERECEDEN DENKLEMLER

ÖZELLİK | Property 8

Bir denklem sisteminde n farklı değişken varsa bu değişkenlerin her birinin tek çözümünün olması için birbirinden bağımsız (lineer bağımsız) n farklı denklem verilmesi gerekir.

If there are n distinct variables in a system of equations, n different equations which are independent (linearly independent) must be given for each variable to have a single solution.

1. $2xy - x + y - 4 = 0$

$\Rightarrow x = ?$

$\frac{4-y}{2y-1}$

2. $2x - y + xy - 8 = 0$

$\Rightarrow y = ?$

$\frac{8-2x}{x-1}$

3. $3ab - b + 2a = 0$

$\Rightarrow a = ?$

$\frac{b}{3b+2}$

4. $4ab - 2a + b = 0$

$\Rightarrow b = ?$

$\frac{2a}{4a+1}$

5. $2xy - 3x + 4y - 8 = 0$

$\Rightarrow y = ?$

$\frac{8+3x}{2x+4}$

6. $x + y = 8$

$y + z = 6$

$x + z = 2$

$\Rightarrow x + y + z = ?$

8

7. $x + y = 11$

$y + z = 13$

$x + z = 8$

$\Rightarrow x + y + z = ?$

16

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

$x \cdot y = 20$

$y \cdot z = 35$

$x \cdot z = 28$

$\Rightarrow z = ?$

7

9. $x, y, z \in Z^-$

$x \cdot y = 24$

$y \cdot z = 18$

$x \cdot z = 12$

$\Rightarrow y = ?$

-6

10. $x + y = 6$

$x \cdot z = 2$

$y \cdot z = 10$

$\Rightarrow z = ?$

2

11. $x + y = 8$

$x \cdot z = 13$

$y \cdot z = 11$

$\Rightarrow z = ?$

3

12. $x - y = 1$

$x \cdot z = 8$

$y \cdot z = 6$

$\Rightarrow z = ?$

2

13. $a - b = 12$

$a \cdot c = 20$

$b \cdot c = -28$

$\Rightarrow c = ?$

4

14. $x - y = 12$

$y + z = 7$

$x - z = 13$

$x = ?$

16

15. $x - y = 14$

$x + z = 10$

$y - z = -6$

$\Rightarrow x = ?$

9

16. $3x + y + 2z = 18$

$2x + 4y - 3z = 20$

$x + y - 3z = 12$

$\Rightarrow x - y + z = ?$

5

17. $\left.\begin{array}{l} \frac{x \cdot z}{y} = \frac{21}{2} \\ \frac{y \cdot z}{x} = \frac{25}{14} \\ \frac{x \cdot y}{z} = \frac{16}{15} \end{array}\right\} \Rightarrow x \cdot y \cdot z = ?$

20

18. $a, b, c \in R^+$

$a \cdot b = 9 \cdot c$

$b \cdot c = 16 \cdot a$

$\Rightarrow b = ?$

12

19. $7m - 2n = 38$

$m + 4n = 14$

$\Rightarrow m^2 - n^2 = ?$

32

20. $\frac{6}{b} - \frac{a \cdot c - x^2}{a \cdot x} = \frac{7x - b \cdot c}{b \cdot x}$

$\Rightarrow x = ?$

$\frac{a}{b}$

21. $a \neq b$

$3a + \frac{5}{a} = 3b + \frac{5}{b}$

$\Rightarrow a \cdot b = ?$

$\frac{5}{3}$

22. $x > 0$

$y > 0$

$\frac{x+y}{15} = \frac{x-y}{5}$

$x^2 - y^2 = 243$

$\Rightarrow x = ?$

18

23. $x, y, z \in R^+$

$\left.\begin{array}{l} x^3 \cdot y^2 = 4z \\ y^3 \cdot z = 2x \\ z^4 \cdot x^2 = 32y \end{array}\right\} \Rightarrow x \cdot y \cdot z = ?$

4

BİRİNCİ DERECEDEN DENKLEMLER

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

1. $\frac{0,03+x}{0,02} = \frac{0,7-x}{0,4}$

$\Rightarrow x = ?$

$\frac{1}{210}$

2. $\frac{x}{x-7} + 3x = \frac{7}{x-7} + 16$

$\Rightarrow x = ?$

5

3. $9 + \cfrac{12}{7 - \cfrac{20}{3 + \cfrac{6}{x-1}}} = 15$

$\Rightarrow x = ?$

7

4. $x, y \in N^+$

$x^2 - y^2 = 13$

$\Rightarrow x \cdot y = ?$

42

5. $\frac{6}{x} + \frac{2}{y} = 2$

$\frac{1}{x} - \frac{3}{y} = 2$

$\Rightarrow y = ?$

-2

6. $x, y \in R$

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

$\Rightarrow x \cdot y = ?$

40

7. $\left.\begin{array}{l} \frac{3}{x} + y = 7 \\ \frac{3}{y} + x = 2 \end{array}\right\} \Rightarrow \frac{x}{y} = ?$

$\frac{2}{7}$

8. $2x + 3y + 4z = 9$

$4x + 3y + 2z = 15$

$\Rightarrow x + y + z = ?$

4

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

9. $\left.\begin{array}{l} x-z=8 \\ x\cdot y=64 \\ y\cdot z=24 \end{array}\right\} \Rightarrow y=?$

5

10. $x, y, z \in R^+$

$\left.\begin{array}{l} x\cdot y=12 \\ y\cdot z=30 \\ x\cdot z=20 \end{array}\right\} \Rightarrow y=?$

$3\sqrt{2}$

11. $x, y, z \in R^+$

$\left.\begin{array}{l} x\cdot y=\frac{1}{4} \\ y\cdot z=\frac{2}{15} \\ x\cdot z=\frac{3}{10} \end{array}\right\} \Rightarrow y=?$

$\frac{1}{3}$

12. $\left.\begin{array}{l} a+b=12 \\ b+c=8 \\ c+a=10 \end{array}\right\} \Rightarrow a=?$

7

13. $a-b=23$

$b+c=9$

$c-d=6$

$\Rightarrow a-2b-2c+d=?$

8

14. $\frac{x+y}{x}=6$

$\frac{z-x}{x}=3$

$x+y+z=50$

$\Rightarrow z=?$

20

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

$2a-3b=13$

$a-c=4$

$4c+3b=37$

$\Rightarrow a=?$

11

16. $\left.\begin{array}{l} \frac{x\cdot y}{x+y}=\frac{1}{7} \\ \frac{y\cdot z}{y+z}=\frac{1}{9} \\ \frac{x\cdot z}{x+z}=\frac{1}{4} \end{array}\right\} \Rightarrow x=?$

1

BİRİNCİ DERECEDEN DENKLEMLER

TEST 1

1. $3x + 4 = 2x - 7$

$\Rightarrow x = ?$

A) -5 B) -7 C) -9 D) -11 E) -13

2. $2x - (4 - x) = x + 18$

$\Rightarrow x = ?$

A) 9 B) 10 C) 11 D) 12 E) 13

3. $3x - (x - 2) = 2 \cdot (x + 5)$

$\Rightarrow$ S.S. = ?

A) 0 B) Ø C) R D) $R - \{0\}$ E) $\{1\}$

4. $5x - 3 + 2x = 3x + 13$

$\Rightarrow x = ?$

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

5. $6 - (4 + x) + 3x = x - 8$

$\Rightarrow x = ?$

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

6. $3x - 2 \cdot (x + 7) = 8x - 7 \cdot (x + 2)$

$\Rightarrow$ S.S. = ?

A) 0 B) Ø C) R D) $\{3\}$ E) $\{5\}$

7. $2 \cdot (a - 3) + 4 \cdot (a + 2) - a + 13 = 0$

$\Rightarrow a = ?$

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

8. $6 - 2 \cdot (x - 5) + 4 = 4 \cdot (4 - x)$

$\Rightarrow x = ?$

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

9. $3-\{2\cdot[x-7]-3\cdot[4-x]\}=2\cdot(14-3x)$
$\Rightarrow x=?$

A) $\frac{27}{7}$ B) $\frac{1}{11}$ C) 0 D) -1 E) $-\frac{27}{7}$

10. $3\cdot(1-a)+4\cdot(a-2)=0$
$\Rightarrow a=?$

A) 1 B) $\frac{11}{7}$ C) 5 D) 11 E) 12

11. $5\cdot(a+2)-3\cdot(2a-1)+2\cdot(a-1)=0$
$\Rightarrow a=?$

A) -11 B) -2 C) 0 D) 1 E) 5

12. $3\cdot(x-4)+5\cdot(2-x)=2\cdot(x+5)$
$\Rightarrow x=?$

A) -3 B) -2 C) 1 D) 4 E) 10

13. $6x-[-5\cdot(3+x)]=4\cdot(3x+4)$
$\Rightarrow x=?$

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

14. $5x-[-3x-(2x-\{x-9\})]=0$
$\Rightarrow x=?$

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

15. $\frac{x}{3}-2=x+4$
$\Rightarrow x=?$

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

16. $\frac{x+1}{5}=\frac{x-4}{4}$
$\Rightarrow x=?$

A) 6 B) 9 C) 12 D) 18 E) 24

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

$\Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 6

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

$\Rightarrow x=?$

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

3. $\frac{6}{2x-6}=\frac{5}{1+x}$

$\Rightarrow x=?$

A) –6 B) –4 C) $\frac{9}{4}$ D) 9 E) 10

4. $\frac{x}{3}-\left(\frac{x}{2}-\frac{x}{3}+1\right)=0$

$\Rightarrow x=?$

A) 1 B) 3 C) 4 D) 6 E) 8

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

$\Rightarrow x=?$

A) – 36 B) – 8 C) $\frac{4}{3}$ D) 2 E) 12

6. $\frac{x+2}{4}-\frac{x-1}{3}=\frac{x}{12}$

$\Rightarrow x=?$

A) $-\frac{1}{3}$ B) 0 C) 5 D) 6 E) 8

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

$\Rightarrow x=?$

A) 0 B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

8. $\frac{x-4}{4}+\frac{x+10}{5}-10=0$

$\Rightarrow x=?$

A) 9 B) 10 C) 20 D) 24 E) 25

9. $3\cdot\frac{x}{2}-2\cdot\frac{x}{3}=30$

$\Rightarrow x=?$

A) 0 B) 1 C) 3 D) 12 E) 36

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

$\Rightarrow x=?$

A) -7 B) 5 C) 17 D) 29 E) 32

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

$\Rightarrow x=?$

A) 4 B) 6 C) 8 D) 10 E) 12

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

$\Rightarrow x=?$

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

13. $x\cdot\left(5-\frac{3}{x}\right)=4\cdot(3-x)$

$\Rightarrow x=?$

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

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

$\Rightarrow x=?$

A) $-\frac{5}{3}$ B) $-\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{5}{6}$

15. $\left[\frac{x}{3}+\frac{2x}{5}-\frac{3x}{2}\right]+\left[\frac{x}{2}+\frac{2x}{3}-\frac{7x}{5}\right]=4$

$\Rightarrow x=?$

A) -8 B) -4 C) $-\frac{5}{2}$ D) $-\frac{1}{2}$ E) 0

16. $\frac{x}{2}-\left[\frac{x}{3}+\frac{x}{2}\cdot\left(1-\frac{2}{3}\right)-\frac{x}{6}\right]=-\frac{1}{2}$

$\Rightarrow x=?$

A) 0 B) -1 C) -2 D) -3 E) -6

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TEST 3

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

$\Rightarrow x = ?$

A) –2 B) 2 C) 3 D) 5 E) 6

2. $\frac{1}{2x} - \frac{1}{3x} = \frac{1}{24}$

$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 6 E) 12

3. $\frac{1}{3x} + \frac{2}{5x} - \frac{1}{x} = \frac{1}{15}$

$\Rightarrow x = ?$

A) – 6 B) – 4 C) $-\frac{4}{15}$ D) $\frac{1}{15}$ E) $\frac{1}{5}$

4. $\frac{1}{6x} + \frac{1}{2x} + \frac{1}{3x} = \frac{1}{5}$

$\Rightarrow x = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{5}{3}$ D) $\frac{25}{6}$ E) 5

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

$\Rightarrow x = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 7

6. $\frac{x}{0,2} - \frac{x}{0,5} = -15$

$\Rightarrow x = ?$

A) 5 B) 3 C) 1 D) –3 E) –5

7. $\frac{0,05+x}{0,04} = \frac{0,3-x}{0,2}$

$\Rightarrow x = ?$

A) $\frac{1}{15}$ B) $\frac{1}{30}$ C) $\frac{1}{60}$ D) $\frac{1}{120}$ E) $\frac{1}{240}$

8. $\frac{x}{0,4} + \frac{x}{0,3} - \frac{x}{0,6} = -25$

$\Rightarrow x = ?$

A) – 8 B) – 6 C) 0 D) 2 E) 4

9. $\frac{0,x}{0,04} - \frac{0,0x}{0,005} + \frac{0,x}{0,02} = 33$

$\Rightarrow x = ?$

A) 0,1 B) 1 C) 3 D) 5 E) 6

10. $\frac{5 \cdot (0,0x + 0,x)}{0,x + x} + x = 2$

$\Rightarrow x = ?$

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

11. $\frac{x+3}{x-1} = \frac{x+5}{x+3}$

$\Rightarrow x = ?$

A) -14 B) -7 C) 2 D) 4 E) 6

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

$\Rightarrow$ S.S. = ?

A) $\left\{\frac{1}{2}\right\}$ B) {1} C) {2} D) Ø E) R

13. $3x - \{-2 \cdot [5x + 2]\} = mx + 5$

S.S. = Ø

$\Rightarrow m = ?$

A) -7 B) -2 C) 5 D) 8 E) 13

14. $7x + 2 \cdot (x + 9) = ax + 7$

S.S. = Ø

$\Rightarrow a = ?$

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

15. $3 \cdot (x - 4) + 5x = 2 \cdot (x - ax - 6)$

S.S. = R

$\Rightarrow a = ?$

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

16. $ax + 18 = 5x - 3 \cdot (x + b)$

S.S. = R

$\Rightarrow a + b = ?$

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

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

$\Rightarrow x=?$

A) 3 B) 4 C) 5 D) 10 E) 25

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

$\Rightarrow x=?$

A) 11 B) 9 C) 6 D) 3 E) 2

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

$\Rightarrow x=?$

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

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

$\Rightarrow x=?$

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

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

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

A) Ø B) R C) {2} D) {(1, 2)} E) {3, 4}

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

$\Rightarrow x=?$

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

7. $\frac{2x+1}{x-1}+\frac{5x+7}{1-x}=3$

$\Rightarrow x=?$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $-\frac{1}{6}$ D) $\frac{1}{5}$ E) $\frac{1}{7}$

8. $\frac{x(x-7)}{x-2}+\frac{x+3}{x-3}+\frac{2x-3}{x+1}-\frac{3x}{x+2}=0$

$\Rightarrow x=?$

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

9. $2x+1+\frac{7}{x-9}=3x-5-\frac{7}{9-x}$

$\Rightarrow x=?$

A) -1 B) 2 C) 3 D) 6 E) 9

10. $\frac{10}{3x-1}-3\cdot\left(4+\frac{x+3}{3x-1}\right)=x-10$

$\Rightarrow x=?$

A) -4 B) -3 C) 2 D) 10 E) 20

11. $\frac{2x}{2x+4}-\frac{x}{5}-\frac{x}{3}=2-\left[\frac{2x}{5}+\frac{x}{3}+\frac{4}{2x+4}\right]$

$\Rightarrow x=?$

A) 1 B) 2 C) 5 D) 15 E) 20

12. $\frac{2x+7}{x-1}+\frac{3x+6}{1-x}=1$

$\Rightarrow$ S.S. = ?

A) R B) Ø C) $R\setminus\{1\}$ D) $\{1\}$ E) $\{0\}$

13. $4+\cfrac{12}{2+\cfrac{16}{5+\cfrac{6}{x-9}}}=7$

$\Rightarrow x=?$

A) 6 B) 7 C) 8 D) 10 E) 11

14. $7-\cfrac{6}{10-\cfrac{16}{5-\cfrac{9}{x+1}}}=4$

$\Rightarrow x=?$

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

15. $1+\cfrac{12}{2+\cfrac{24}{5+\cfrac{14}{x+9}}}=4$

$\Rightarrow x=?$

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

16. $\cfrac{\cfrac{\cfrac{x+11}{2}+4}{\cfrac{5}{2}}+4}{+4}=5$

$\Rightarrow x=?$

A) -39 B) -17 C) -10 D) 17 E) 30

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TEST 5

1. $\left.\begin{matrix} x+y=10 \\ x-y=4 \end{matrix}\right\} \Rightarrow x=?$

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

2. $\left.\begin{matrix} 3x+y=11 \\ 2x+y=8 \end{matrix}\right\} \Rightarrow y=?$

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

3. $\left.\begin{matrix} x-y=2 \\ 2x+3y=14 \end{matrix}\right\} \Rightarrow$ S.S. $=\{(x, y)\}=?$

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

4. $\left.\begin{matrix} x+y=\frac{7}{3} \\ x-y=\frac{5}{3} \end{matrix}\right\} \Rightarrow x=?$

A) 12 B) 8 C) 4 D) 2 E) $\frac{2}{3}$

5. $\left.\begin{matrix} x-y=8 \\ -(x+y)=6 \end{matrix}\right\} \Rightarrow x=?$

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

6. $\left.\begin{matrix} 5x+4y=12 \\ 5y-5x=6 \end{matrix}\right\} \Rightarrow x=?$

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

7. $\left.\begin{matrix} 4x+y=10 \\ 5x-2y=6 \end{matrix}\right\} \Rightarrow \frac{x}{y}=?$

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

8. $\left.\begin{matrix} 2x-3y=17 \\ x+3y=10 \end{matrix}\right\} \Rightarrow y=?$

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

9. $\left.\begin{matrix} 4x - 3y = 9 \\ x + y = 4 \end{matrix}\right\} \Rightarrow x \cdot y = ?$

A) $\frac{3}{2}$ B) 2 C) 3 D) $\frac{7}{2}$ E) $\frac{9}{2}$

10. $\left.\begin{matrix} 7x - 2y = 5 \\ 5y - 4x = 4 \end{matrix}\right\} \Rightarrow x + y = ?$

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

11. $\left.\begin{matrix} 2x + 3y = 12 \\ 3x + 2y = 13 \end{matrix}\right\} \Rightarrow x \cdot y = ?$

A) – 4 B) 3 C) 6 D) 12 E) 18

12. $\left.\begin{matrix} 2x - y = 2 \\ 3x - 2y = 9 \end{matrix}\right\} \Rightarrow x \cdot y = ?$

A) 20 B) 30 C) 42 D) 60 E) 75

13. $\left.\begin{matrix} 4x + 3y = -8 \\ 3x + 4y = -13 \end{matrix}\right\} \Rightarrow \frac{y}{x} = ?$

A) – 4 B) – 1 C) 1 D) 4 E) 5

14. $\left.\begin{matrix} x - y = 2xy \\ x + y = 10xy \end{matrix}\right\} \Rightarrow x \cdot y = ?$

A) $\frac{1}{6}$ B) $\frac{1}{12}$ C) $\frac{1}{18}$ D) $\frac{1}{24}$ E) $\frac{1}{48}$

15. $\left.\begin{matrix} ax + by = 3 \\ bx + 2ay = 5 \\ (x, y) = (1, -1) \end{matrix}\right\} \Rightarrow (a, b) = ?$

A) (8, 5) B) (5, 8) C) (– 8, – 11)
D) (3, 2) E) (4, 7)

16. $\left.\begin{matrix} ax - by = 4 \\ 2bx + 4ay = 4 \\ (x, y) = (2, -1) \end{matrix}\right\} \Rightarrow b = ?$

A) 2 B) 3 C) $\frac{7}{2}$ D) $\frac{9}{2}$ E) 5

1. $xy + x - y + 3 = 0$

$\Rightarrow x = ?$

A) $\frac{y+3}{y+1}$ B) $\frac{y-3}{y+1}$ C) $\frac{y+1}{y-3}$

D) $\frac{y-3}{y-1}$ E) 2

2. $4 - 3x + 4xy + y = 0$

$\Rightarrow x = ?$

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

D) $\frac{4+y}{3-4y}$ E) $\frac{3-y}{4+y}$

3. $2ab - b + 8a + ab = 6$

$\Rightarrow b = ?$

A) $\frac{3a-1}{6-8a}$ B) $\frac{-2a}{3a-1}$ C) $\frac{3a-1}{2a}$

D) $\frac{6-8a}{3a-1}$ E) $4a - 3$

4. $\left.\begin{array}{l} \frac{7}{x}+\frac{3}{y}=5 \\ \frac{2}{x}-\frac{1}{y}=\frac{8}{3} \end{array}\right\} \Rightarrow x = ?$

A) 1 B) 2 C) 7 D) 11 E) 13

5. $\left.\begin{array}{l} \frac{5}{x}+\frac{2}{y}=7 \\ \frac{3}{x}-\frac{1}{y}=2 \end{array}\right\} \Rightarrow x \cdot y = ?$

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

6. $\left.\begin{array}{l} \frac{4}{x}+\frac{6}{y}=4 \\ \frac{1}{x}+\frac{3}{y}=\frac{3}{2} \end{array}\right\} \Rightarrow x \cdot y = ?$

A) 6 B) 9 C) 12 D) 18 E) 24

7. $\left.\begin{array}{l} \frac{3}{x}+\frac{2}{y}=\frac{7}{3} \\ \frac{2}{x}+\frac{3}{y}=-4 \end{array}\right\} \Rightarrow x = ?$

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

8. $\left.\begin{array}{l} \frac{5}{x}-\frac{2}{y}=-5 \\ \frac{4}{y}+\frac{10}{x}=6 \end{array}\right\} \Rightarrow y = ?$

A) $\frac{1}{2}$ B) $\frac{5}{6}$ C) 1 D) $\frac{6}{5}$ E) 2

9. $\left.\begin{matrix} x + 2y = 5 \\ 3x + 6y = 10 \end{matrix}\right\} \Rightarrow$ S.S. = ?

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

10. $\left.\begin{matrix} x - 3y = 4 \\ 3x - 9y = 5 \end{matrix}\right\} \Rightarrow$ S.S. = ?

A) $\{(1, 3)\}$ B) $\{(3, 4)\}$ C) $\{(3, 2)\}$ D) R E) Ø

11. $\left.\begin{matrix} 2x - 5y = 2 \\ -6x + 15y = 8 \end{matrix}\right\} \Rightarrow$ S.S. = ?

A) $\{(1, 3)\}$ B) $\{(2, 4)\}$ C) $\{(2, 1)\}$ D) R E) Ø

12. $ax + 3y = 7$

$2x - y = 11$

S.S. = Ø

$\Rightarrow a = ?$

A) – 2 B) – 3 C) – 4 D) – 6 E) – 9

13. $2x + ay = 4$

$4x - 6y = 8$

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

$\Rightarrow a = ?$

A) – 3 B) – 2 C) 1 D) 2 E) 4

14. $2x - y + z = 3$

$y - z + ax = 4$

S.S. = Ø

$\Rightarrow a = ?$

A) – 2 B) – 1 C) 2 D) 4 E) 7

15. $6x + z = 4$

$12x + az = 8$

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

$\Rightarrow a = ?$

A) – 3 B) – 2 C) 2 D) 3 E) 4

16. $ax + 2y = 4$

$8x + 4ay = -11$

S.S. = Ø

$\Rightarrow a^2 = ?$

A) 2 B) 3 C) 4 D) 8 E) 16

1. $\left.\begin{array}{l} x+y=5 \\ y+z=11 \\ x+z=8 \end{array}\right\} \Rightarrow x\cdot y\cdot z=?$

A) 18 B) 20 C) 24 D) 28 E) 30

2. $\left.\begin{array}{l} x-y=7 \\ y+z=4 \\ x-z=5 \end{array}\right\} \Rightarrow x+y+z=?$

A) 8 B) 9 C) 10 D) 11 E) 12

3. $\left.\begin{array}{l} 2x-y=15 \\ 2x+3z=12 \\ z+5y=-3 \end{array}\right\} \Rightarrow x+y+z=?$

A) 7 B) 6 C) 5 D) 2 E) 1

4. $x, y, z \in R^+$

$\left.\begin{array}{l} x\cdot y=12 \\ y\cdot z=14 \\ x\cdot z=42 \end{array}\right\} \Rightarrow x=?$

A) 2 B) 4 C) 6 D) 7 E) 12

5. $x, y, z \in R^-$

$\left.\begin{array}{l} x\cdot y=32 \\ y\cdot z=48 \\ x\cdot z=24 \end{array}\right\} \Rightarrow z=?$

A) 6 B) 4 C) –1 D) –2 E) –6

6. $x, y, z \in Z^-$

$\left.\begin{array}{l} x\cdot z=21 \\ x\cdot y=14 \\ z\cdot y=6 \end{array}\right\} \Rightarrow x=?$

A) –7 B) –3 C) –2 D) 3 E) 7

7. $x, y, z \in Z$

$z > x > y$

$\left.\begin{array}{l} x\cdot y=12 \\ y\cdot z=-8 \\ x\cdot z=-6 \end{array}\right\} \Rightarrow x+y+z=?$

A) –19 B) –5 C) 1 D) 5 E) 19

8. $3a+4b+c=20$

$5a+4b+7c=36$

$\Rightarrow a+b+c=?$

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

9. $\left.\begin{array}{l} a-b+3c=6 \\ 3a+5b+c=10 \end{array}\right\} \Rightarrow a+b+c=?$

A) 2 B) 4 C) 7 D) 10 E) 16

10. $\left.\begin{array}{l} 2x-y+3z=4 \\ 6z+4x+2y=12 \end{array}\right\} \Rightarrow y=?$

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

11. $\left.\begin{array}{l} x-y+3z=7 \\ 3x-3y+z=-11 \end{array}\right\} \Rightarrow z=?$

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

12. $\left.\begin{array}{l} 2x+y+2z=9 \\ 5\cdot(x+z)+6y=12 \end{array}\right\} \Rightarrow y=?$

A) -7 B) -3 C) 1 D) 2 E) 7

13. $\left.\begin{array}{l} 2a-b+3c=13 \\ 4a+b+5c=37 \end{array}\right\} \Rightarrow a+b+c=?$

A) 9 B) 10 C) 11 D) 12 E) 13

14. $\left.\begin{array}{l} 7x+5y+z=3 \\ 3x+y-3z=4 \end{array}\right\} \Rightarrow x+y+z=?$

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

15. $\left.\begin{array}{l} 2x+3y-3z=3 \\ x-y-z=4 \end{array}\right\} \Rightarrow 4x+y-5z=?$

A) 3 B) 4 C) 5 D) 7 E) 11

16. $\left.\begin{array}{l} 2a-b+7c=6 \\ 3a+8c=15 \end{array}\right\} \Rightarrow a+b+c=?$

A) 3 B) 4 C) 7 D) 9 E) 10

1. $\left.\begin{array}{l} 2b-c+d=3 \\ b-2c+2d=7 \end{array}\right\} \Rightarrow b+c-d=?$

A) -10 B) -7 C) -4 D) 4 E) 10

2. $\left.\begin{array}{l} a\cdot x\cdot y=10 \\ b\cdot x\cdot y=4 \\ a+b=7 \end{array}\right\} \Rightarrow x\cdot y=?$

A) 2 B) 4 C) 6 D) 7 E) 10

3. $\left.\begin{array}{l} a\cdot x=12 \\ a\cdot y=18 \\ x+y=10 \end{array}\right\} \Rightarrow a=?$

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

4. $\left.\begin{array}{l} a\cdot x=8 \\ a\cdot y=6 \\ x-y=2 \end{array}\right\} \Rightarrow a=?$

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

5. $x, a, b, c \in R$

$\left.\begin{array}{l} x\cdot a=6 \\ x\cdot b=10 \\ x\cdot c=14 \\ a+b=-8 \end{array}\right\} \Rightarrow c=?$

A) -14 B) -7 C) -2 D) -1 E) 1

6. $x, y, z \in R^+$

$\left.\begin{array}{l} x\cdot y=4\cdot z \\ y\cdot z=9\cdot x \end{array}\right\} \Rightarrow y=?$

A) 1 B) 2 C) 4 D) 6 E) 9

7. $\left.\begin{array}{l} \frac{3}{a}+b=2 \\ \frac{3}{b}+a=3 \end{array}\right\} \Rightarrow \frac{a}{b}=?$

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

8. $\left.\begin{array}{l} \frac{4}{a}+b=2 \\ \frac{4}{b}+a=7 \end{array}\right\} \Rightarrow \frac{a}{b}=?$

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

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

$3x + 7y = 42$

$\Rightarrow x = ?$

A) 3 B) 6 C) 7 D) 14 E) 21

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

$13x + 5y = 49$

$\Rightarrow x = ?$

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

11. $x, y, z \in Z^+$

$x > y > z$

$3x + 5y + 7z = 29$

$\Rightarrow x - y + z = ?$

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

12. $x, y, z \in Z^+$

$7x + 4y + 5z = 20$

$\Rightarrow y = ?$

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

13. $a \neq b$

$ax + a^2 = bx + b^2$

$\Rightarrow x = ?$

A) $a + b$ B) $a - b$ C) $-a - b$ D) $b - a$ E) $a \cdot b$

14. $x \neq y$

$5x - y^2 = 5y - x^2$

$\Rightarrow x + y = ?$

A) -5 B) -4 C) 4 D) 5 E) 10

15. $a \neq b$

$3a + \frac{7}{a} = 3b + \frac{7}{b}$

$\Rightarrow a \cdot b = ?$

A) $\frac{3}{7}$ B) $\frac{7}{3}$ C) 4 D) 10 E) 21

16. $a \neq b$

$4b - \frac{8}{a} = 4a - \frac{8}{b}$

$\Rightarrow a \cdot b = ?$

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

BİRİNCİ DERECEDEN DENKLEMLER

TEST 9

1. $\frac{a \cdot b}{a+b} = \frac{1}{3}$

$\Rightarrow \frac{1}{a} + \frac{1}{b} = ?$

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

2. $x, y \in N^+$

$x^2 - y^2 = 19$

$\Rightarrow x \cdot y = ?$

A) 45 B) 56 C) 72 D) 90 E) 99

3. $3 - \frac{9 - \frac{1 + \frac{x}{7}}{2}}{5} = 2 \Rightarrow x = ?$

A) 21 B) 28 C) 35 D) 42 E) 49

4. $x \cdot y = 1$

$x^3y^2 + y^4x^3 = 5$

$\Rightarrow x + y = ?$

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

5. $(x - y + 4)^3 - (x + y - 6)^3 = 0$

$\Rightarrow y = ?$

A) -10 B) -5 C) 0 D) 5 E) 10

6. $x, y \in R$

$(x + y - 8)^2 + (x - y - 10)^4 = 0$

$\Rightarrow x = ?$

A) 10 B) 9 C) 8 D) 7 E) 1

7. $(x - 3) \cdot (x + 5) = (x - 3) \Rightarrow$ S.S. = ?

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

D) $\{-4, 3\}$ E) $\{-3\}$

8. $(x^2 - 4) \cdot (x + 2) = (x - 2) \cdot 9$

$\Rightarrow$ S.S. = ?

A) R B) $\{-5, 1\}$ C) $\{1\}$

D) $\{-5\}$ E) $\{-5, 1, 2\}$

9. $(x^3 - x) = (x^2 + x)$

$\Rightarrow$ S.S. = ?

A) R B) Ø C) {–1, 0, 2}

D) {–1, 0} E) R \ {2}

10. $x - y - z = 0$

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

A) 3 B) 1 C) $\frac{1}{3}$ D) 0 E) –1

11. $2x - y - z = 0$

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

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

12. $5x - 5y + z = 0$

$\Rightarrow \dfrac{z}{x-y} \cdot \dfrac{5y-z}{x} = ?$

A) – 25 B) – 5 C) 1 D) 5 E) 25

13. $a \cdot b \cdot c \neq 0$

$\left.\begin{array}{l} 2ab = 3c \\ 10ac = 6b \\ 3bc = 5a \end{array}\right\} \Rightarrow a \cdot b \cdot c = ?$

A) $\frac{1}{15}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{2}{3}$ E) $\frac{3}{2}$

14. $x \neq 0$

$y \neq 0$

$\left.\begin{array}{l} 2xy + y^2 = 3y \\ 3xy - 2x^2 = 5x \end{array}\right\} \Rightarrow x = ?$

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

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

$2x \neq y$

$2x^3 - yx^2 - 2xy^2 + y^3 = 10x - 5y$

$\Rightarrow x + y = ?$

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

16. $\left.\begin{array}{l} \dfrac{4}{x\cdot y} - \dfrac{5}{y\cdot z} = 7 \\ \dfrac{10}{y\cdot z} + \dfrac{2}{x\cdot y} = -12 \end{array}\right\} \Rightarrow x \cdot y = ?$

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

YANIT ANAHTARI | ANSWER KEY

TEST 1

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

TEST 2

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

TEST 3

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

TEST 4

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

TEST 5

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

TEST 6

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

TEST 7

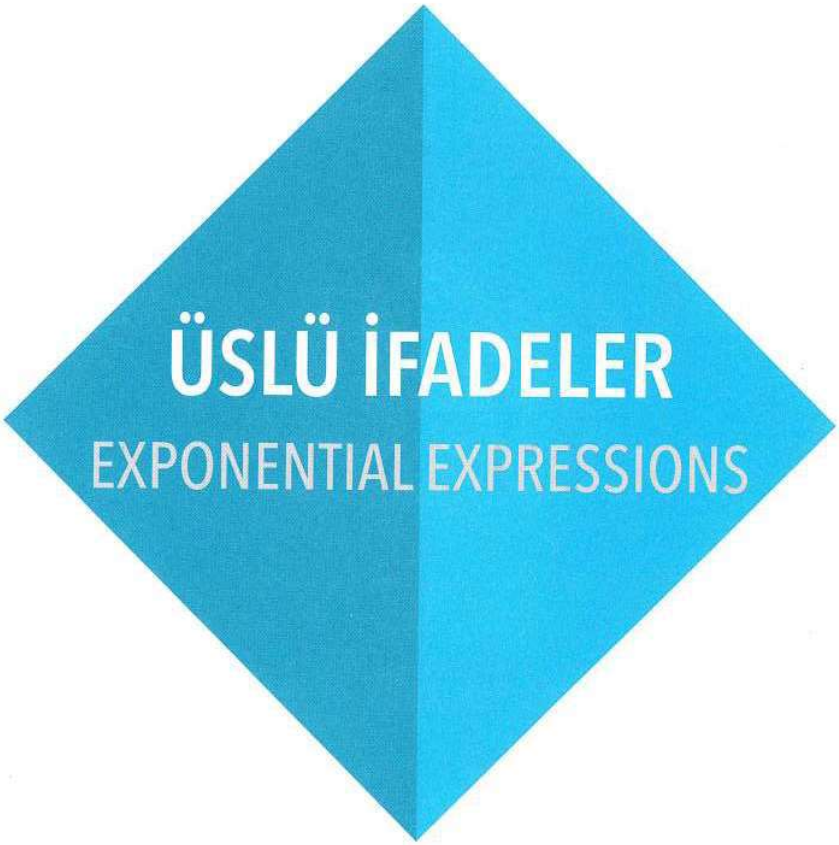
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D	E	B	C	E	A	B	C	B	B	E	B	D	B	E	D

TEST 8

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

TEST 9

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


ÜSLÜ İFADELER
EXPONENTIAL EXPRESSIONS

ÜSLÜ İFADELER

ÖZELLİK | Property 1

Üslü İfadeler | Exponents

n pozitif tamsayı, a da gerçel sayı ise a^n, n tane a'nın çarpımıdır.

If n is positive integer, and a is e real number, a^n represents the product of n factors each of which is a.

$$a^n = \underbrace{a \cdot a \cdot a \cdot \ldots \cdot a}_{\text{n tane } (n\text{-times})}$$

$x \neq 0$

$0^x = 0$

$x^0 = 1$

$0^0 \rightarrow$ belirsiz *(undefined)*

1. $2^5 = ?$ — 32

2. $3^3 = ?$ — 27

3. $6^3 + 0^2 = ?$ — 216

4. $8^2 + 2^0 = ?$ — 65

5. $4^3 = ?$ — 64

6. $3^2 + 2^3 = ?$ — 17

7. $5^3 - 6^2 = ?$ — 89

8. $4^2 + 3^3 = ?$ — 43

9. $4^3 + 7^2 = ?$ — 113

10. $5^2 - 8^2 = ?$ — −39

11. $2^4 + 3^3 + 4^2 = ?$ — 59

12. $11^2 + 10^2 - 9^2 = ?$ — 140

13. $13^2 - 2^6 = ?$ — 105

14. $7^3 - 5^3 = ?$ — 218

15. $10^2 + 6^3 = ?$ — 316

ÖZELLİK | Property 2

$a \in R \qquad n, k \in Z$

$a^n \cdot a^k = a^{n+k}$

1. $2^2 \cdot 2^4 = ?$

2^6

2. $3^2 \cdot 3^3 \cdot 3^4 = ?$

3^9

3. $5^3 \cdot 5^2 \cdot 5^5 = ?$

5^{10}

4. $7^2 \cdot 7^3 \cdot 7^1 = ?$

7^6

5. $6^4 \cdot 6^{-3} = ?$

6

6. $11^5 \cdot 11^{-2} = ?$

11^3

7. $5^3 \cdot 5^2 \cdot 5^{-8} = ?$

5^{-3}

8. $6^2 \cdot 6^{-4} \cdot 6^5 \cdot 6^{-3} = ?$

1

9. $5^3 \cdot 5^2 \cdot 5^7 \cdot 5^{-8} = ?$

5^4

10. $2^5 \cdot 2^x \cdot 2^2 = 2^{13}$

$\Rightarrow x = ?$

6

11. $5^4 \cdot 5^2 \cdot 5^1 = 5^x$

$\Rightarrow x = ?$

7

12. $3^2 \cdot 3^4 \cdot 3^4 = 3^x$

$\Rightarrow x = ?$

10

13. $5^5 \cdot 5^{-2} \cdot 5^1 = 5^x$

$\Rightarrow x = ?$

4

14. $7^3 \cdot 7^4 \cdot 7^x = 7^{10}$

$\Rightarrow x = ?$

3

15. $9^3 \cdot 9^4 \cdot 9^x = 9^5$

$\Rightarrow x = ?$

-2

ÜSLÜ İFADELER

ÖZELLİK | Property 3

$a \in R \qquad n, k \in Z$

$$\frac{a^n}{a^k} = a^{n-k}$$

1. $\frac{7^4}{7^3} = ?$ — 7

2. $\frac{6^8}{6^3} = ?$ — 6^5

3. $\frac{11^5}{11^2} = ?$ — 11^3

4. $\frac{6^4 \cdot 6^5}{6^3} = ?$ — 6^6

5. $\frac{3^4 \cdot 3^5}{3^2} = ?$ — 3^7

6. $\frac{5^4 \cdot 5^5 \cdot 5^1}{5^3} = ?$ — 5^7

7. $\frac{3^4 \cdot 3^{-2}}{3^2} = ?$ — 1

8. $\frac{7^4 \cdot 7^{-2} \cdot 7^5}{7^3} = ?$ — 7^4

9. $\frac{13^6 \cdot 13^4 \cdot 13^{-7}}{13^2} = ?$ — 13

10. $\frac{5^3 \cdot 5^6 \cdot 5^{-2}}{5^{-1}} = ?$ — 5^8

11. $\frac{2^5}{2^2} = 2^x$

$\Rightarrow x = ?$ — 3

12. $\frac{3^8 \cdot 3^4}{3^2} = 3^x$

$\Rightarrow x = ?$ — 10

13. $\frac{5^4 \cdot 5^6}{5^5} = 5^x$

$\Rightarrow x = ?$ — 5

14. $\frac{6^7 \cdot 6^{-2}}{6^4} = 6^x$

$\Rightarrow x = ?$ — 1

15. $\frac{3^4 \cdot 3^5}{3^{-2}} = 3^x$

$\Rightarrow x = ?$ — 11

ÖZELLİK | Property 4

$a \in R \qquad n, k \in Z$

$(a^n)^k = a^{n \cdot k}$

$(a^n)^k = (a^k)^n$

1. $(2^3)^2 = ?$ — 2^6

2. $(3^4)^3 = ?$ — 3^{12}

3. $(7^2)^4 = ?$ — 7^8

4. $\left((5^{-3})^2\right)^4 = ?$ — 5^{-24}

5. $((-2)^2)^3 = ?$ — 2^6

6. $(-2^2)^3 = ?$ — -2^6

7. $(-3^5)^2 = ?$ — 3^{10}

8. $(-3^2)^5 = ?$ — -3^{10}

9. $(7^2)^4 = 7^x$
$\Rightarrow x = ?$ — 8

10. $\frac{(27)^3}{(9)^2} = ?$ — 3^5

11. $(32)^{\frac{2}{5}} = ?$ — 2^2

12. $(25)^3 = 5^x$
$\Rightarrow x = ?$ — 6

13. $\left(\left(\frac{1}{8}\right)^{-2}\right)^3 = 2^x$
$\Rightarrow x = ?$ — 18

14. $\left((-2)^{-2}\right)^3 = 4^x$
$\Rightarrow x = ?$ — -3

15. $((-3)^2)^{-4} \cdot 27^3 = ?$ — 3

ÜSLÜ İFADELER

ÖZELLİK | Property 5

$a, b \in R \qquad n \in N$

- $a^{-1} = \frac{1}{a}$
- $\left(\frac{a}{b}\right)^{-1} = \frac{b}{a}$
- $a^{-n} = \frac{1}{a^n}$
- $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$

1. $3^{-1} = ?$ $\boxed{\frac{1}{3}}$

2. $5^{-1} = ?$ $\boxed{\frac{1}{5}}$

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

4. $2^{-2} = ?$ $\boxed{\frac{1}{4}}$

5. $(-5)^{-2} = ?$ $\boxed{\frac{1}{25}}$

6. $-5^{-2} = ?$ $\boxed{-\frac{1}{25}}$

7. $\left(\frac{3}{5}\right)^{-1} = ?$ $\boxed{\frac{5}{3}}$

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

9. $\left(\frac{3}{8}\right)^{-1} = ?$ $\boxed{\frac{8}{3}}$

10. $\left(\frac{5}{9}\right)^{-1} = ?$ $\boxed{\frac{9}{5}}$

11. $\left(\frac{2}{7}\right)^{-2} = ?$ $\boxed{\frac{49}{4}}$

12. $\left(\frac{3}{5}\right)^{-2} = ?$ $\boxed{\frac{25}{9}}$

13. $\left(\frac{2}{3}\right)^{-2} = ?$ $\boxed{\frac{9}{4}}$

14. $2^{-3} = ?$ $\boxed{\frac{1}{8}}$

15. $-2^{-2} = ?$ $\boxed{-\frac{1}{4}}$

16. $(-2)^{-2} = ?$ $\boxed{\frac{1}{4}}$

17. $(-3^{-1})^{-2} = ?$ $\boxed{9}$

18. $(-3^{-2})^{-1} = ?$ — -9

19. $(-2^{-3})^{-1} = ?$ — -8

20. $(-5^{-2})^{-1} = ?$ — -25

21. $-1^{-1} + 3^{-1} = ?$ — $-\frac{2}{3}$

22. $\frac{2^{-1}}{5} = ?$ — $\frac{1}{10}$

23. $\frac{2^{-2}}{3} = ?$ — $\frac{1}{12}$

24. $2^{-4} + 4^{-2} = ?$ — $\frac{1}{8}$

25. $\left(\frac{4}{9}\right)^{-1} + 4^{-2} = ?$ — $\frac{37}{16}$

26. $\left(\frac{2}{5}\right)^{-1} + \frac{2^{-1}}{5} = ?$ — $\frac{13}{5}$

27. $\left(\frac{1}{3}\right)^{-2} - 2^{-2} = ?$ — $\frac{35}{4}$

28. $\frac{1}{2} \cdot 6^{-1} + \frac{4^{-1}}{3} = ?$ — $\frac{1}{6}$

29. $\left(\frac{2}{3}\right)^{-3} \cdot 2^4 = ?$ — 54

30. $(-4)^3 \cdot (-8)^{-2} + (-1)^5 = ?$ — -2

31. $(-3^2)^{-2} + \frac{9^{-2}}{2^{-3}} = ?$ — $\frac{1}{9}$

32. $2^{-4} + \left(\frac{16}{15}\right)^{-1} = ?$ — 1

33. $\left(\frac{2}{7}\right)^{-2} \cdot \left(\frac{1}{4}\right)^{-1} = ?$ — 49

ÜSLÜ İFADELER

ÖZELLİK | Property 6

$a \in R \quad a \notin \{1, -1, 0\}$

$a^n = a^k \Rightarrow n = k$

1. $2^x = 4$
$\Rightarrow x = ?$

2

2. $3^x = 81$
$\Rightarrow x = ?$

4

3. $5^{x+2} = 125$
$\Rightarrow x = ?$

1

4. $2^3 \cdot 2^5 \cdot 2^4 = 2^x$
$\Rightarrow x = ?$

12

5. $3^6 \cdot 3^4 \cdot 3^8 = 9^x$
$\Rightarrow x = ?$

9

6. $(3^2)^4 = 3^x$
$\Rightarrow x = ?$

8

7. $6^{2x-1} = 216$
$\Rightarrow x = ?$

2

8. $9^4 \cdot 3^2 \cdot 27^2 = 3^x$
$\Rightarrow x = ?$

16

9. $[(4)^{-2}]^6 = 2^x$
$\Rightarrow x = ?$

-24

10. $4^{x+1} = 2^{x-1}$
$\Rightarrow x = ?$

-3

11. $9^{x+1} = 27^{x-1}$
$\Rightarrow x = ?$

5

12. $2^{8x} = 4^{x+1}$
$\Rightarrow x = ?$

$\frac{1}{3}$

13. $5^{x-2} = 25^{x+1}$
$\Rightarrow x = ?$

-4

14. $8^x = 2^{x-2}$
$\Rightarrow x = ?$

-1

15. $32^{\frac{2}{5}} \cdot 16^{\frac{1}{2}} \cdot 8^{\frac{2}{3}} = 2^x$
$\Rightarrow x = ?$

6

ÖZELLİK | Property 7

$a, b \in R \qquad n \in Z$

$$a^n \cdot b^n = (a \cdot b)^n$$

1. $2^4 \cdot 3^4 = ?$ — 6^4

2. $3^2 \cdot 4^2 = ?$ — 12^2

3. $2^3 \cdot 3^3 \cdot 5^3 = ?$ — 30^3

4. $2^5 \cdot 7^5 = 14^x \Rightarrow x = ?$ — 5

5. $-3^2 \cdot 5^2 = ?$ — -15^2

6. $(-3)^2 \cdot (5)^2 = ?$ — 15^2

7. $2^6 \cdot 3^6 \cdot 5^6 = x^6 \Rightarrow x = ?$ — ∓ 30

ÖZELLİK | Property 8

$a, b \in R \qquad n \in Z$

$$\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$$

1. $\frac{6^2}{3^2} = ?$ — 2^2

2. $\frac{30^4}{10^4} = ?$ — 3^4

3. $\frac{5^4}{7^4} = \left(\frac{5}{7}\right)^x \Rightarrow x = ?$ — 4

4. $\frac{10^3}{6^3} = \left(\frac{5}{3}\right)^x$ — 3

5. $\left(\frac{6}{5}\right)^x = \frac{6^x}{25} \Rightarrow x = ?$ — 2

6. $\left(\frac{3}{2}\right)^2 = \frac{9}{4^x} \Rightarrow x = ?$ — 1

7. $\left(\frac{12}{5}\right)^x = 12^x \cdot 25 \Rightarrow x = ?$ — -2

ÜSLÜ İFADELER

ÖZELLİK | Property 9

Üslü ifadelerde toplam durumundaki ifadeler ortak çarpan parantezine alınır, çarpım haline getirilir ve çözüm yapılır.

In exponential expressions, the expressions which are to be added are performed within parenthesis and transformed into a multiplication, then solved.

Örnek | Example

$2^x + 2^{x+1} = 24$

$2^x + 2^x \cdot 2 = 24$

$2^x \cdot (1 + 2) = 24$

$3 \cdot 2^x = 24$

$2^x = 8$

$2^x = 2^3$

$\Rightarrow x = 3$

1. $3^x + 3^x = 18$

$\Rightarrow x = ?$

2

2. $3 \cdot 2^x + 2^x = 32$

$\Rightarrow x = ?$

3

3. $3 \cdot 5^x - 5^x + 2 \cdot 5^x = 100$

$\Rightarrow x = ?$

2

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

64

5. $4 \cdot 3^2 + 6 \cdot 3^2 - 3^2 = ?$

3^4

6. $5^{x+1} + 2 \cdot 5^x - 3 \cdot 5^x = 20$

$\Rightarrow x = ?$

1

7. $2^{x+2} - 3 \cdot 2^x + 2^{x+1} = 48$

$\Rightarrow x = ?$

4

8. $3^x + \frac{4}{3^{-x}} = 45$

$\Rightarrow x = ?$

2

9. $5^{x+1} - 2 \cdot 5^x = 75$

$\Rightarrow x = ?$

2

10. $6^{x+2} + 2 \cdot 6^x - 3 \cdot 6^{x+1} = 20$

$\Rightarrow x = ?$

0

11. $3^{x+1} + 3^{x+2} = 36$

$\Rightarrow x = ?$

1

12. $\frac{3^{x+3} + 54}{3^x + 2} = ?$

27

13. $\frac{2^{x+1} - 2^x}{2^{x-1} + 2^x} = ?$

$\frac{2}{3}$

14. $\frac{2^x \cdot 2^x \cdot 2^x \cdot 2^x}{2^x + 2^x + 2^x + 2^x} = 2$

$\Rightarrow x = ?$

1

15. $\frac{6^{68} + 6^{69} + 6^{70}}{6^{69} + 6^{70} + 6^{71}} = ?$

$\frac{1}{6}$

ÖZELLİK | Property 10

$n \in N^+$

2n çift sayı, (2n – 1) tek sayı

2n is even number, (2n – 1) is odd number

$a \in R^+ \Rightarrow a^n \in R^+$

$a \in R^- \Rightarrow a^{2n} \in R^+$ ve *(and)* $a^{2n-1} \in R^-$

$$(-1)^m = \begin{cases} -1 & \text{m tek ise } \textit{(if m is odd)} \\ 1 & \text{m çift ise } \textit{(if m is even)} \end{cases}$$

1. $(-2)^3 + (-2)^2 = ?$ — -4

2. $(-1)^{100} + (-1)^{303} - (-1)^{23} = ?$ — 1

3. $(-1^{20}) + (-1^3) + (-1^{-20}) = ?$ — -3

4. $999^0 - (-2)^2 - (-3)^2 - (-5^0) = ?$ — -11

5. $0^3 + (-3)^0 - 2^{-2} = ?$ — $\frac{3}{4}$

6. $(-1)^{999} - (-1^{32}) + (-1^{-1}) = ?$ — -1

7. $(-333)^0 - (-1^{-333}) - \left(-\frac{1}{3}\right)^{-2} = ?$ — -7

8. $-2^{-2} + 3^{-1} + 2^{-3} = ?$ — $\frac{5}{24}$

9. $\left(-\frac{1}{9}\right)^{-6} \cdot 27^{-5} = ?$ — $\frac{1}{27}$

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

11. $n \in Z^+$

$(-2)^{2n+1} - (-2)^{2n+2} + 2^{2n+3} = ?$ — 2^{2n+1}

12. $(-9)^0 - (-2)^4 \cdot (-2) + (-3^2) = ?$ — 24

13. $((-2)^3)^2 \cdot ((-2)^2)^{-3} \cdot (-2)^{2^3}$ — 256

14. $\left(-\frac{1}{8}\right)^{-\frac{2}{3}} - (9)^{\frac{3}{2}} = ?$ — -23

15. $(-1)^{2016} + (-1999)^0 - (-2)^3 = ?$ — 10

ÜSLÜ İFADELER

ÖZELLİK | Property 11

$a, b \in R$

$a \notin \{1, -1, 0\}$ ve *(and)* $b \notin \{1, -1, 0\}$

$a^n = b^n \Rightarrow \begin{cases} a = b & n \text{ tek sayı } \textit{(n is odd number)} \\ a = \mp b & n \text{ çift sayı } \textit{(n is even number)} \end{cases}$

1. $(2x + 1)^7 = (x - 2)^7$
$\Rightarrow x = ?$

-3

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

-3

3. $(2x)^5 = (x - 3)^5$
$\Rightarrow x = ?$

-3

4. $(5x - 2)^6 = (x + 4)^6$
$\Rightarrow$ S.S. = ?

$\left\{\frac{3}{2}, -\frac{1}{3}\right\}$

5. $(-x + 7)^4 = (-2x - 3)^4$
$\Rightarrow$ S.S. = ?

$\left\{-10, \frac{4}{3}\right\}$

6. $(x)^6 = (2x - 1)^6$
$\Rightarrow$ S.S. = ?

$\left\{1, \frac{1}{3}\right\}$

7. $x^4 = (x + 2)^2$
$\Rightarrow$ S.S. = ?

$\{2, -1\}$

8. $(4x + 3)^5 = (3x - 2)^5$
$\Rightarrow x = ?$

-5

9. $(7x + 2)^{13} = (5x + 10)^{13}$

4

10. $x^3 = (9 - 2x)^3$

3

11. $27x^3 = (x - 12)^3$

-6

12. $(7 - x)^2 = (2x - 8)^2$
$\Rightarrow$ S.S = ?

$\{1, 5\}$

13. $(x^2 + 2)^2 = (x + 8)^2$
$\Rightarrow$ S.S = ?

$\{-2, 3\}$

14. $x^2 + 2x + 1 = (3x - 3)^2$
$\Rightarrow$ S.S = ?

$\left\{\frac{1}{2}, 2\right\}$

15. $(-x + 13)^4 = (2x - 5)^4$
$\Rightarrow$ S.S = ?

$\{-8, 6\}$

ÖZELLİK | Property 12

$A(x)^{B(x)} = 1$

- $B(x) = 0$ ve *(and)* $A(x) \in R \setminus \{0\}$
- $A(x) = 1$ ve *(and)* $B(x) \in R$
- $A(x) = -1$ ve *(and)* $B(x)$ çift sayı *(even number)*

1. $4^x = 1$
$\Rightarrow x = ?$

0

2. $2^{x+7} = 1$
$\Rightarrow x = ?$

-7

3. $4^{2x-4} = 1$
$\Rightarrow x = ?$

2

4. $12^{3x-12} = 1$
$\Rightarrow x = ?$

4

5. $7^{-x-4} = 1$
$\Rightarrow x = ?$

-4

6. $(3x-2)^7 = 1$
$\Rightarrow x = ?$

1

7. $(2x-1)^8 = 1$
$\Rightarrow$ S.S. = ?

{0, 1}

8. $(4x-3)^6 = 1$
$\Rightarrow$ S.S. = ?

$\left\{\frac{1}{2}, 1\right\}$

9. $(2x-5)^{-4} = 1$
$\Rightarrow x = ?$

{2, 3}

10. $(x-2)^{2x} = 1$
$\Rightarrow$ S.S. = ?

{0, 1, 3}

11. $(x+1)^{2x+1} = 1$
$\Rightarrow$ S.S. = ?

$\left\{\frac{-1}{2}, 0\right\}$

12. $(x+5)^{x-2} = 1$
$\Rightarrow$ S.S. = ?

{−6, −4, 2}

13. $(x-3)^{x+6} = 1$
$\Rightarrow$ S.S. = ?

{−6, 2, 4}

14. $(2x-3)^{x-2} = 1$
$\Rightarrow$ S.S. = ?

{2}

15. $(x-2)^{(x^2-4)} = 1$
$\Rightarrow$ S.S. = ?

{−2, 3}

ÜSLÜ İFADELER

ÖZELLİK | Property 13

$a \in R \setminus \{0, 1, -1\}$

$b \in R \setminus \{0, 1, -1\}$

$$\left.\begin{matrix} a^x = b^y \\ a^m = b^n \end{matrix}\right\} \Rightarrow \frac{x}{m} = \frac{y}{n}$$

1. $2^x = 3^4$

$2^6 = 3^y$

$\Rightarrow x \cdot y = ?$

24

2. $5^x = 6^4$

$6^{6y} = 5^{15}$

$\Rightarrow x \cdot y = ?$

10

3. $4^x = 3^6$

$8^y = 3^4$

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

$\frac{9}{4}$

4. $25^x = 7^8$

$5^y = 7^4$

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

1

5. $125^x = 64$

$8^y = 25$

$\Rightarrow x \cdot y = ?$

$\frac{4}{3}$

6. $81 = 125^x$

$5^y = 3$

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

$\frac{4}{3}$

ÖZELLİK | Property 14

Üslü İfadelerde Sıralama

Ordering in Exponential Expressions

- $a > 1$

  $a^x < a^y \Rightarrow x < y$

- $0 < a < 1$

  $a^x < a^y \Rightarrow x > y$

Aşağıdaki ifadeleri sıralayınız.

Ordering of the expressions below.

1. $a = 2^{-3}$

$b = 2^{-1}$

$c = 2^{-7}$

$c < a < b$

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

$y = \left(\frac{1}{3}\right)^{12}$

$z = \left(\frac{1}{3}\right)^{20}$

$z < y < x$

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

$y = (-2^3)^4$

$z = -2^{(4^3)}$

$z < x < y$

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

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

$z = \left(\frac{1}{2}\right)^{\frac{1}{7}}$

$x < y < z$

5. $a = 5^{28}$

$b = 3^{42}$

$c = 2^{56}$

$c < a < b$

Aşağıdaki ifadeleri sıralayınız.
Ordering of the expressions below.

1. $a = 5^2$
$b = 5^4$
$c = 5^8$

$a < b < c$

2. $a = (-3)^2$
$b = (-3)^4$
$c = (-3)^5$

$c < a < b$

3. $a = 2^{-7}$
$b = 2^5$
$c = 2^{-3}$

$a < c < b$

4. $a = (-4)^{-2}$
$b = (-4)^2$
$c = (-4)^3$

$c < a < b$

5. $a = \left(\frac{2}{7}\right)^{-1}$
$b = \left(\frac{2}{7}\right)^{2}$
$c = \left(\frac{2}{7}\right)^{5}$

$a > b > c$

6. $a = \left(\frac{1}{6}\right)^{-3}$
$b = \left(\frac{1}{6}\right)^{-5}$
$c = \left(\frac{1}{6}\right)^{-10}$

$a < b < c$

7. $a = 3^{30}$
$b = 3^{45}$
$c = 3^{75}$

$a < b < c$

8. $a = (2^3)^5$
$b = 2^{(2^3)}$
$c = (2^3)^{12}$

$b < a < c$

9. $a = 2^{60}$
$b = 3^{80}$
$c = 5^{40}$

$a < c < b$

10. $2^a = 17$
$3^b = 12$
$5^c = 138$

$b < c < a$

11. $4^a = 67$
$5^b = 30$
$7^c = 14$

$c < b < a$

12. $15^{3x-1} = 230$
$\Rightarrow ? < x < ?$

$1 < x < \frac{4}{3}$

13. $a \in Z^+$
$\left(\frac{4}{7}\right)^{2a+5} < \left(\frac{4}{7}\right)^{17-a}$
$\Rightarrow \min(a) = ?$

5

14. $a \in Z$
$\left(\frac{1}{3}\right)^{3a-7} < 3^{a-9}$
$\Rightarrow \min(a) = ?$

5

15. $a \in Z^-$
$\left(\frac{2}{5}\right)^{4-a} > \left(\frac{25}{4}\right)^{a+4}$
$\Rightarrow \max(a) = ?$

-13

16. $a \in Z$
$8^{a+2} < 2^{2a+13}$
$\Rightarrow \max(a) = ?$

6

ÜSLÜ İFADELER

ÖZELLİK | Property 15

- $n \in N^+$

$10^1 = 10$

$10^2 = 10 \cdot 10 = 100$

$10^3 = 10 \cdot 10 \cdot 10 = 1000$

$\vdots$

$10^n = 10 \cdot 10 \cdot 10 \cdot \ldots \cdot 10 = \underbrace{1000\ldots0}_{\text{n tane } (n\text{-times})}$

- $n \in N$

$10^{-1} = \frac{1}{10} = 0,1$

$10^{-2} = \frac{1}{10} \cdot \frac{1}{10} = \frac{1}{100} = 0,01$

$10^{-3} = \frac{1}{10} \cdot \frac{1}{10} \cdot \frac{1}{10} = \frac{1}{1000} = 0,001$

$\vdots$

$10^{-n} = \frac{1}{10} \cdot \frac{1}{10} \cdot \frac{1}{10} \cdot \ldots \cdot \frac{1}{10} = \frac{1}{1000\ldots0} = 0,\underbrace{000\ldots.1}_{\substack{\text{n tane} \\ n\text{-times}}}$

Örnek | Example

$365000 = 365 \cdot 10^3 = 36,5 \cdot 10^4 = 3,65 \cdot 10^5$

$0,0000365 = 365 \cdot 10^{-7} = 36,5 \cdot 10^{-6} = 3,65 \cdot 10^{-5}$

1. $3 \cdot 10^4 + 2 \cdot 10^4 = ?$

$5 \cdot 10^4$

2. $0,0021 - 0,0020 = ?$

10^{-4}

3. $0,3 \cdot 10^4 + 2,1 \cdot 10^4 = ?$

$2,4 \cdot 10^4$

4. $32 \cdot 10^4 + 2 \cdot 10^5 = ?$

$5,2 \cdot 10^5$

5. $7 \cdot 10^{-2} + 3 \cdot 10^2 = ?$

300,07

6. $17 \cdot 10^{-2} + 15 \cdot 10^{-2} = ?$

0,32

7. $2,8 \cdot 10^{-3} + 120 \cdot 10^{-5} = ?$

$4 \cdot 10^{-3}$

8. $2 \cdot (0,2)^2 + (0,3)^3 = ?$

$107 \cdot 10^{-3}$

9. $\frac{3}{0,2} - (0,25)^{-1} = ?$

11

10. $0,2 \cdot 10^6 + 2 \cdot 10^5 = ?$

$4 \cdot 10^5$

11. $2 \cdot 10^{-13} + 0,4 \cdot 10^{-12} = ?$

$6 \cdot 10^{-13}$

12. $3,2 \cdot 10^{-3} - 0,21 \cdot 10^{-2}$

$11 \cdot 10^{-4}$

13. $\frac{1}{0,0001} \cdot (0,06 + 0,14) = ?$

2000

PUZA YAYINLARI

14. $2 \cdot 10^{-11} \cdot 3 \cdot 10^{15} = ?$

$6 \cdot 10^4$

15. $7 \cdot 10^{-12} \cdot 3 \cdot 10^{-7} = ?$

$21 \cdot 10^{-19}$

16. $5 \cdot 10^{16} \cdot 4 \cdot 10^{-12} = ?$

$2 \cdot 10^5$

17. $0{,}800 + \left(0{,}2 + \frac{1}{5}\right) \cdot 2 = ?$

1,6

18. $4 + \frac{5}{100} + \frac{4}{10^3} = ?$

4,054

19. $\frac{6{,}8}{0{,}0017} = ?$

$4 \cdot 10^3$

20. $\frac{0{,}00040 + 0{,}0029}{0{,}66} = ?$

$5 \cdot 10^{-3}$

21. $\frac{0{,}24 \cdot 10^{-4}}{3 \cdot 10^3} = ?$

$8 \cdot 10^{-9}$

22. $\frac{0{,}5 \cdot 10^{13}}{5 \cdot 10^{-2}} = ?$

10^{14}

23. $\frac{(0{,}03)^3 \cdot (0{,}05)}{5400} = ?$

$25 \cdot 10^{-11}$

24. $\frac{0{,}1}{0{,}01} + \frac{0{,}01}{0{,}001} - \frac{0{,}001}{0{,}0001} = ?$

10

25. $\frac{51 \cdot 10^{-19}}{0{,}17 \cdot 10^{-19}} = ?$

$3 \cdot 10^2$

26. $(0{,}00025)^3 \cdot (80000)^2 = ?$

0,1

27. $\frac{3 \cdot 10^{-4} - 1{,}1 \cdot 10^{-3}}{10^{-5}} = ?$

-80

28. $\frac{8 \cdot 10^{-6} + 6 \cdot 10^{-5}}{3{,}4 \cdot 10^{-4}} + \frac{5 \cdot 10^{-3} + 40 \cdot 10^{-4}}{0{,}09 \cdot 10^{-1}} = ?$

1,2

29. $0,\underbrace{000\ldots0}_{\substack{\text{n tane} \\ n \text{ times}}}6 = 0{,}006 \cdot 10^{-9}$

$\Rightarrow n = ?$

11

ÜSLÜ İFADELER

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

1. Bu soruda ilk önce ifadenin işareti bulunur.

In this question, firstly determine the sign of the expression.

$$\frac{(-2)^7 \cdot (-2^4) \cdot (-2^{-2})}{-2^6 \cdot (-2)^{-2}} = ?$$

32

2. $$\frac{360000 \cdot 10^{-12}}{0{,}0012 \cdot 10^{-4}} = ?$$

3

3. $(x-4)^2 + (3x-y-1)^4 = 0$

$\Rightarrow x \cdot y = ?$

44

4. $x, y \in Z$

$7^{x-2} = 5^{y+5}$

$\Rightarrow x \cdot y = ?$

−10

5. $$\frac{11}{1+17^3} + \frac{11}{1+17^{-3}} = ?$$

11

6. $9^a = 5$

$25^b = 2$

$8^c = 3$

$\Rightarrow a \cdot b \cdot c = ?$

$\frac{1}{12}$

7. $3^x = 5^y$

$9^{\frac{x}{y}} - 25^{\frac{y}{x}} = ?$

16

8. $\frac{a}{b} = \frac{2}{3}$

$a^b = b^a$

$\Rightarrow b - a = ?$

$\frac{9}{8}$

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

9. $3^x = a$

$2^x = b$

$\Rightarrow 108^x$'in a ve b türünden değeri nedir?

What is the value of 108^x in terms of a and b?

a^3b^2

10. $m, n \in Z$

$\left(\frac{1}{m}\right)^{-n} = \frac{1}{81}$

$\Rightarrow \min(m + n) = ?$

-11

11. $x = 9 \cdot 10^{-5}$

$\Rightarrow (0{,}03) \cdot (0{,}0003) \cdot (0{,}009) = ?$

$10 \cdot x^2$

12. $3^x \cdot 5^y \cdot 7^z = 9$

$6^x \cdot 10^y \cdot 14^z = 144$

$\Rightarrow x + y + z = ?$

4

13. $x^x + x^x + x^x + x^x = 2^{26}$

$\Rightarrow x = ?$

8

14. $x = 5^a - 5^{-a}$

$y = 5^a + 5^{-a}$

$\Rightarrow y^2 - x^2 = ?$

4

15. $x^a \in R^+$

$x^b \in R^+$

$x^{a+b} = 9$

$x^{a-b} = 4$

$\Rightarrow x^a + x^b = ?$

$\frac{15}{2}$

16. $(x-3)^{(x-5)} + 3 = x$

$\Rightarrow$ S.S. = ?

{2, 3, 4, 6}

ÜSLÜ İFADELER

TEST 1

1. $(-2)^7 \cdot (-2^2) \cdot (-2^{-4}) = ?$

A) -8 B) -16 C) -32 D) 32 E) 64

2. $(-3^2)^{-4} \cdot 9^3 = ?$

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

3. $\frac{[1+(-1)^{302}]^0 \cdot (-2)^4}{-2^2} = ?$

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

4. $(-5)^{2010} \cdot (+5)^{-2011} = ?$

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

5. $A = 8^8$ $B = 4^4$

$\Rightarrow \frac{A}{B} = ?$

A) 2^2 B) 2^4 C) 2^8 D) 2^{16} E) 2^{20}

6. $(-1)^{2009} - 1^{2010} = ?$

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

7. $(-1)^{-2003} + (-1)^{42} - (-1^{2004}) = ?$

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

8. $40 \cdot (3^{-2} + 7^0)^{-1} = ?$

A) 20 B) 24 C) 28 D) 36 E) 64

9. $[(-2^5)\cdot(-2^2)]^3 = ?$

A) -2^{30} B) -2^{21} C) 2^{21} D) 2^{30} E) 2^{60}

10. $(-2)^{2009}\cdot(-2)^{-2010} = ?$

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

11. $(3^{-1}+3^0)^{-2}\cdot 2^4 = ?$

A) 1 B) 3 C) 4 D) 8 E) 9

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

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{9}$ D) $\frac{1}{12}$ E) $\frac{1}{16}$

13. $(-3^{-1})+\left(-\frac{1}{3}\right)^{-2}\cdot(3^{-3}) = ?$

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

14. $\frac{(-8)^3}{-2^{-2}} = ?$

A) 2^{11} B) 2^9 C) 2^7 D) -2^7 E) -2^{11}

15. $(-2^{-2})^{-3} = ?$

A) -64 B) -32 C) 16 D) $\frac{1}{32}$ E) $\frac{1}{16}$

16. $(-3^2)^{-3}\cdot\left(\frac{1}{5^{2009}}\right)^0 = ?$

A) 3^{-6} B) 3^{-5} C) -3^{-1} D) -3^{-5} E) -3^{-6}

1. $3^{-3} \cdot (-3)^{-3} \cdot 3^3 \cdot (-3^4) = ?$

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

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

A) 1 B) 3 C) 9 D) 16 E) 25

3. $\left[\left(\frac{3}{2}\right)^{-2} + \left(\frac{9}{5}\right)^{-1}\right]^{-3} = ?$

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

4. $-5^2 \cdot \left(\frac{1}{25}\right)^{-2} \cdot (-5^2)^{-3} = ?$

A) $\frac{1}{25}$ B) 1 C) 5^2 D) 5^6 E) 5^{12}

5. $\frac{3^0+3^1-3^2}{3^3-3^2-3^1} = ?$

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

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

A) –1 B) 0 C) 1 D) $\frac{3}{2}$ E) 3

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

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

8. $\left[2+\left(-\frac{1}{2}\right)^{-1}\right]^2 = ?$

A) $-\frac{1}{16}$ B) $-\frac{1}{4}$ C) 0 D) $\frac{1}{4}$ E) 4

9. $\left(\frac{2^{17}}{4^8}\right)^2 : \left(\frac{2^{15}}{8^4}\right)^4 = ?$

A) $\frac{1}{1024}$ B) $\frac{1}{512}$ C) $\frac{1}{256}$ D) $\frac{1}{64}$ E) 64

10. $\frac{(20)^{-3}\cdot(8)}{(25)^{-2}\cdot\frac{1}{8}} = ?$

A) 2 B) 4 C) 5 D) 20 E) 25

11. $\left[\frac{2}{5}+5^{-1}\right]\cdot\left[\left(-\frac{5}{3}\right)^{-2}\right]^{-\frac{1}{2}} = ?$

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

12. $\left[\left(-\frac{1}{27}\right)^{-2}\right]^{\frac{1}{3}} = ?$

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

13. $\frac{2^2\cdot 4^4\cdot 8^8}{(32)^6} = ?$

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

14. $\frac{9\cdot 3^3\cdot 3^6}{(81)^2} = ?$

A) 3 B) 9 C) 27 D) 81 E) 243

15. $\frac{(15)^4\cdot(12)^6}{(27)^3\cdot(20)^4} = ?$

A) 50 B) 48 C) 45 D) 36 E) 30

16. $\frac{(21)^3\cdot(15)^2\cdot(35)^2}{7^4\cdot(5^{-4})^{-1}\cdot 3^4} = ?$

A) 15 B) 21 C) 25 D) 35 E) 49

1. $\frac{3^{1001}+9^{500}}{27^{333}} = ?$

A) 3 B) 4 C) 6 D) 9 E) 12

2. $\frac{16^{100}+4^{200}}{2^{399}} = ?$

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

3. $\frac{3^{2004}-3^{2002}}{3^{2003}+3^{2002}} = ?$

A) 1 B) 2 C) 9 D) 81 E) 243

4. $\frac{480000 \cdot 10^{-16}}{0,00012 \cdot 10^{-7}} = ?$

A) 400 B) 40 C) 4 D) 0,4 E) 0,04

5. $\frac{0,0005 \cdot 10^{6}}{0,00125 \cdot 10^{4}} = ?$

A) 0,1 B) 0,5 C) 0,25 D) 8 E) 40

6. $\frac{3 \cdot 10^{-4}+4 \cdot 10^{-5}}{5 \cdot 10^{-6}} = ?$

A) 3,4 B) 6,8 C) 34 D) 68 E) 72

7. $(0,004)^{-3} \cdot (0,005)^{3} \cdot \frac{4}{5} = ?$

A) $\frac{4}{5}$ B) 1 C) $\frac{25}{16}$ D) 4 E) 5

8. $(0,01)^{2} \cdot (0,4)^{3} \cdot (0,02)^{-3} = ?$

A) $16 \cdot 10^{-3}$ B) 0,08 C) 0,8 D) $8 \cdot 10^{2}$ E) $64 \cdot 10^{2}$

9. $(0{,}00001)^{-(0,1)} = ?$

A) $-\frac{1}{10}$ B) $\frac{1}{10}$ C) $10^{-\frac{1}{2}}$ D) $10^{\frac{1}{2}}$ E) 10

10. $\left.\begin{array}{l} A = (-3^2)^{-1} \\ B = \left(\frac{1}{81}\right)^{-\frac{1}{4}} \end{array}\right\} \Rightarrow A \cdot B = ?$

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

11. $16^{\frac{3}{4}} \cdot 8^{\frac{2}{3}} \cdot 2 = ?$

A) 2^5 B) 2^6 C) 2^8 D) 2^{10} E) 2^{12}

12. $(0{,}008)^{-\frac{5}{3}} \cdot 10^{-5} \cdot 4^2 = ?$

A) $\frac{1}{64}$ B) $\frac{1}{32}$ C) $\frac{1}{16}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

13. $(0{,}04)^{\frac{3}{2}} \cdot 10^3 = ?$

A) 4 B) 8 C) 12 D) 16 E) 32

14. $(1{,}44)^{\frac{5}{2}} \cdot 10^4 = ?$

A) 1 B) 1,2 C) $12^5 \cdot 10^{-1}$ D) 24 E) 144

15. $(0{,}02)^{\frac{1}{2}} \cdot (0{,}5)^{\frac{1}{2}} \cdot 10 = ?$

A) 0,1 B) 0,2 C) 1 D) 2 E) 5

16. $(1{,}44)^{\frac{3}{2}} \cdot (0{,}2)^{-3} = ?$

A) 9 B) 18 C) 36 D) 144 E) 216

1. $\frac{2^3 \cdot 2^3 \cdot 2^3 \cdot 2^3}{2^3 + 2^3 + 2^3 + 2^3} = ?$

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

2. $\frac{10^3 + 15^3 + 20^3}{2^3 + 3^3 + 4^3} = ?$

A) 5 B) 25 C) 100 D) 125 E) 150

3. $\frac{7^{77} + 7^{78} + 7^{79}}{7^{78} + 7^{77} + 7^{76}} = ?$

A) $\frac{1}{7}$ B) 1 C) 7 D) 49 E) 343

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

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

5. $\frac{3^{-3} + 3^{-3} + 3^{-3}}{2^{-2} + 2^{-2}} = ?$

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

6. $\frac{(12)^2 + (15)^2 + (21)^2}{(8)^2 + (10)^2 + (14)^2} = ?$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{9}{4}$ E) 16

7. $\frac{4^{-1} + 4^{-1} + 4^{-1} + 4^{-1}}{3^{-1} + 3^{-1} + 3^{-1} + 3^{-1}} = ?$

A) $\frac{1}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{3}$ D) $\frac{16}{3}$ E) $\frac{16}{9}$

8. $\frac{8^2 + 8^2 + 8^2 + 8^2 + 8^2 + 8^2}{2^8 + 2^8 + 2^8} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

9. $\dfrac{3^{2005}+3^{2004}+3^{2003}}{3^{2004}+3^{2003}+3^{2002}} = ?$

A) 1 B) 3 C) 9 D) 13 E) 3^{2004}

10. $\dfrac{2^x \cdot 2^x \cdot 2^x \cdot 2^x}{2^x+2^x+2^x+2^x} = 128$

$\Rightarrow x = ?$

A) –3 B) –2 C) –1 D) 2 E) 3

11. $\dfrac{\left(\frac{1}{14}\right)^2+\left(\frac{1}{18}\right)^2+\left(\frac{1}{6}\right)^2}{\left(\frac{1}{3}\right)^2+\left(\frac{1}{7}\right)^2+\left(\frac{1}{9}\right)^2} = ?$

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

12. $\dfrac{x^{a+3} \cdot x^{b-1}}{x^{a+b}} = ?$

A) x B) x^2 C) x^3 D) x^4 E) x^5

13. $(-x^3)^2 \cdot (-x^4) \cdot (x^{-3})^{-1} \cdot (-x^2)^{-2} = ?$

A) $-x^9$ B) $-x^7$ C) 1 D) x^7 E) x^9

14. $\dfrac{(x^{a-2})^2 \cdot (x^{a-b})^3}{x^{5a-3b-5}} = ?$

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

15. $\dfrac{3^{x+2}+18}{3^x+2} = ?$

A) 1 B) 2 C) 3 D) 6 E) 9

16. $12 \cdot 3^2 + 7 \cdot 3^2 + 8 \cdot 3^2 = 3^x$

$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

1. $3^{x+1} = 27$

$\Rightarrow 2^x = ?$

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

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

$\Rightarrow x = ?$

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

3. $27^{3x-1} = 81^{2x+3}$

$\Rightarrow x = ?$

A) $-\frac{2}{3}$ B) $\frac{1}{3}$ C) 4 D) 9 E) 15

4. $8^{2x} = 16^{x+1}$

$\Rightarrow 7^{x-1} = ?$

A) 0 B) $\frac{1}{49}$ C) $\frac{1}{7}$ D) 1 E) 7

5. $8^{x+7} = 32^{x-3}$

$\Rightarrow x = ?$

A) 12 B) 15 C) 18 D) 24 E) 28

6. $\frac{8^{3n+2}}{2^{9n+3}} = 2^{m-7}$

$\Rightarrow m = ?$

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

7. $4^{a-1} = 2^{3a+1}$

$\Rightarrow 3^a = ?$

A) $\frac{1}{27}$ B) $\frac{1}{9}$ C) $\frac{1}{3}$ D) 1 E) 3

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

$\Rightarrow x = ?$

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

9. $\left(\frac{1}{8}\right)^{1-a} = \frac{1}{4}$

$\Rightarrow a = ?$

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

10. $5^{x+1} = 5^{x-2} \cdot a$

$\Rightarrow a = ?$

A) 1 B) 5 C) 25 D) 125 E) 625

11. $\frac{12^x \cdot 20^x}{15^x} = 64$

$\Rightarrow x = ?$

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

12. $\frac{4^{\frac{3}{4}} \cdot 16^{\frac{1}{8}}}{2^{-2}} = 2^x$

$\Rightarrow x = ?$

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

13. $\frac{9^{\frac{2}{3}} \cdot 27^{\frac{3}{2}}}{81^{\frac{1}{2}}} = 3^x$

$\Rightarrow x = ?$

A) $\frac{10}{3}$ B) $\frac{7}{2}$ C) $\frac{11}{3}$ D) $\frac{23}{6}$ E) 4

14. $\left(\frac{4}{9}\right)^{x-3} = \left(\frac{27}{8}\right)^{x+1}$

$\Rightarrow x = ?$

A) $\frac{3}{5}$ B) $\frac{5}{3}$ C) $\frac{7}{3}$ D) 3 E) 9

15. $\left(\frac{2}{5}\right)^{a+1} = \left(\frac{25}{4}\right)^{2a-3}$

$\Rightarrow a = ?$

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

16. $(-2)^5 + (-2)^6 + (-2)^7 = 2^4 \cdot x$

$\Rightarrow x = ?$

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

1. $3^{x+2} + 3^{x+1} = 108$
$\Rightarrow x = ?$

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

2. $2^{x+1} + 2^x + 2^{x-1} = 56$
$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

3. $7^{x+2} + 2 \cdot 7^x - 4 \cdot 7^{x+1} = 161$
$\Rightarrow x = ?$

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

4. $3 \cdot 3^{n-2} + 6 \cdot 3^{n-1} + 3 \cdot 3^n = 144$
$\Rightarrow n = ?$

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

5. $4^{x+1} + 16 \cdot 4^{x-1} = m \cdot 4^x$
$\Rightarrow m = ?$

A) 6 B) 8 C) 10 D) 12 E) 16

6. $5^{3x-6} = 1$
$\Rightarrow x = ?$

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

7. $2^{x+7} = 1$
$\Rightarrow x = ?$

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

8. $3^x = 5$
$\Rightarrow 3^{x+1} = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

9. $2^{x+2} = 24$

$\Rightarrow 2^{x-1} = ?$

A) 2 B) 3 C) 6 D) 8 E) 12

10. $2^{x+1} = 3$

$\Rightarrow 2^{x-2} = ?$

A) $\frac{3}{16}$ B) $\frac{3}{8}$ C) $\frac{3}{4}$ D) $\frac{3}{2}$ E) 3

11. $7^x = 3$

$\Rightarrow 7^{x-1} = ?$

A) $\frac{3}{7}$ B) $\frac{3}{14}$ C) 2 D) 3 E) 6

12. $5^x = m$

$\Rightarrow 5^{2x+3} = ?$

A) $125 + m^2$ B) $125m^2$ C) $25m^2$ D) $25m$ E) $25 + m$

13. $4^{x+1} = 20$

$\Rightarrow 8^{2x} = ?$

A) 2 B) 6 C) 25 D) 100 E) 125

14. $9^{1-x} = 18$

$\Rightarrow 9^{2-x} = ?$

A) 9 B) 18 C) 36 D) 81 E) 162

15. $(-2)^{2x-4} = 9$

$\Rightarrow 2^x = ?$

A) 3 B) 4 C) 9 D) 12 E) 16

16. $2^a \cdot 3^b = 12$

$\Rightarrow 2^{3-a} \cdot 3^{2-b} = ?$

A) 2 B) 3 C) 6 D) 8 E) 12

1. $\left.\begin{matrix} 2^x = a \\ 3^x = b \end{matrix}\right\} \Rightarrow (108)^x = ?$

A) ab B) a^3b^2 C) a^2b^3 D) a^2b^2 E) a^3b^3

2. $\left.\begin{matrix} 3^x = a \\ 5^x = b \\ 2^x = c \end{matrix}\right\} \Rightarrow 180^x = ?$

A) a^2bc^2 B) a^2b^2c C) $a^2b^2c^2$ D) a^3bc E) a^3b^2c

3. $15^x = 6$

$\Rightarrow 3^{x-1} \cdot 5^{x+1} = ?$

A) 3 B) 6 C) 10 D) 15 E) 30

4. $21^x = 14$

$\Rightarrow 3^{x+1} \cdot 7^{x-1} = ?$

A) 2 B) 3 C) 6 D) 7 E) 14

5. $15^{x-1} = \frac{6}{45}$

$\Rightarrow 3^{x+1} \cdot 5^{x-1} = ?$

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

6. $(32)^{\frac{1}{10}} \cdot (16)^{\frac{1}{8}} \cdot (125)^{\frac{1}{3}} = 10^x$

$\Rightarrow x = ?$

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

7. $7^{x+1} = \frac{147}{3^x}$

$\Rightarrow x = ?$

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

8. $3^{x-1} = \frac{75}{5^x}$

$\Rightarrow x = ?$

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

9. $3^{1-a} = 4$

$\Rightarrow (3^{a-2})^{-1} = ?$

A) $\frac{4}{9}$ B) $\frac{3}{4}$ C) $\frac{4}{3}$ D) 6 E) 12

10. $x^{0,2} = 2$

$\Rightarrow x = ?$

A) 2 B) 4 C) 16 D) 32 E) 64

11. $2^{x+1} \cdot 3^{x-2} = 4$

$\Rightarrow 6^{x-1} = ?$

A) 2 B) 3 C) 4 D) 9 E) 18

12. $125^x = 5^{x-2}$

$\Rightarrow 2^x = ?$

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

13. $\frac{4 \cdot 3^x + 2 \cdot 3^{x+1}}{4 \cdot 3^{x+1} - 2 \cdot 3^x} = ?$

A) 10 B) 6 C) 4 D) 2 E) 1

14. $\frac{4^{2x} + 4^{x+1}}{8^{2x} + 4^{2x+1}} = \frac{1}{4}$

$\Rightarrow x = ?$

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

15. $\frac{3^{x+2} + 3^x + 2 \cdot 3^{x-1}}{3^{x+1} - 6 \cdot 3^{x-2} + 3^{x-1}} = ?$

A) $\frac{1}{3}$ B) $\frac{4}{9}$ C) 1 D) $\frac{12}{7}$ E) 4

16. $x = 5^{a-b+1}$

$\Rightarrow 25^{a-b+2} = ?$

A) x^2 B) $5x^2$ C) $25x^2$ D) $125x^2$ E) $625x^2$

1. $9^{a+1} = 36$

$\Rightarrow 3^a = ?$

A) 2 B) 3 C) 6 D) 9 E) 18

2. $8^{x-2} = 27$

$\Rightarrow 4^{x-1} = ?$

A) 12 B) 24 C) 30 D) 36 E) 48

3. $3^{x-2} + \frac{4}{3^{2-x}} = 45$

$\Rightarrow x = ?$

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

4. $3^{x-1} - \frac{1}{3^{2-x}} = 54$

$\Rightarrow x = ?$

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

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

$\Rightarrow x = ?$

A) –2 B) –1 C) 1 D) 2 E) 4

6. $(x + 7)^3 = (2x + 8)^3$

$\Rightarrow$ S.S. = ?

A) {–1} B) {–5} C) {3}
D) {2} E) {–1, –5}

7. $(x - 7)^5 + (9 - 2x)^5 = 0$

$\Rightarrow$ S.S. = ?

A) $\left\{2, \frac{16}{3}\right\}$ B) $\left\{\frac{16}{3}\right\}$ C) {2}
D) {3} E) {1}

8. $(x + 3)^3 = (3x - 1)^3$

$\Rightarrow$ S.S. = ?

A) {–1} B) {0} C) {1} D) {2} E) {3}

9. $(3x-2)^2 = (2x+4)^2$

$\Rightarrow$ S.S. = ?

A) $\left\{-\frac{2}{5}\right\}$ B) $\left\{-\frac{2}{5}, 6\right\}$ C) R

D) Ø E) $\left\{-\frac{2}{5}, 1, 6\right\}$

10. $(4x+1)^4 = (3x+13)^4$

$\Rightarrow$ S.S. = ?

A) {12} B) {2} C) {6}

D) {–2, 6} E) {12, –2}

11. $\frac{5}{1+x^{-2}} + \frac{5}{1+x^2} = ?$

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

12. $x, y \in Z$

$5^{x-3} = 7^{y+x-9}$

$\Rightarrow x \cdot y = ?$

A) 18 B) 12 C) 9 D) 6 E) 3

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

$\Rightarrow x^{\frac{3}{5}} \cdot y = ?$

A) x B) x^2 C) x^3 D) x^4 E) x^5

14. $(5x-6)^{x+4} = 1$

$\Rightarrow$ S.S. = ?

A) {–4} B) $\left\{-4, \frac{7}{5}\right\}$ C) $\left\{\frac{7}{5}\right\}$

D) $\left\{0, \frac{7}{5}\right\}$ E) $\left\{-4, 1, \frac{7}{5}\right\}$

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

$\Rightarrow$ S.S. = ?

A) {–2} B) {2} C) {–2, 2}

D) {1} E) {–2, 2, 1}

16. $(2x-1)^{x+2} = 1$

$\Rightarrow$ S.S. = ?

A) {–2} B) {1} C) {1, –2}

D) {0, 1} E) {–2, 0, 1}

1. $\left.\begin{matrix} 2^x = 16 \\ 2^y = 32 \end{matrix}\right\} \Rightarrow \frac{x-y}{x+y} = ?$

A) $-\frac{1}{18}$ B) $-\frac{1}{9}$ C) $\frac{1}{3}$ D) $\frac{1}{9}$ E) $\frac{1}{18}$

2. $\left.\begin{matrix} 9^x = 125 \\ 27^y = 25 \end{matrix}\right\} \Rightarrow \frac{x}{y} = ?$

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

3. $\left.\begin{matrix} 4^m = 125 \\ 5^n = 16 \end{matrix}\right\} \Rightarrow m \cdot n = ?$

A) 3 B) 4 C) 6 D) 8 E) 12

4. $x, z \in Z^-$

$y \in Z^+$

$x^y = 4$

$x^z = \frac{1}{16}$

$\Rightarrow \frac{x+2y}{x-z} = ?$

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

5. $\left.\begin{matrix} x^a = 9 \\ x^2 = 3 \cdot x^{-b} \end{matrix}\right\} \Rightarrow a = ?$

A) 2b B) b C) b + 1 D) 2b + 2 E) 2b + 4

6. $\left.\begin{matrix} 2^x \cdot 3^y = 18 \\ 3^x \cdot 2^y = 72 \end{matrix}\right\} \Rightarrow x + y = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

7. $\left.\begin{matrix} 2^{a+3} \cdot 5^b = 400 \\ 2^b \cdot 5^{a+3} = 2500 \end{matrix}\right\} \Rightarrow a + b = ?$

A) 3 B) 5 C) 6 D) 9 E) 11

8. $\left.\begin{matrix} 3^x \cdot 5^y = 9 \\ 3^y \cdot 5^x = 25 \end{matrix}\right\} \Rightarrow x - y = ?$

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

9. $2^a \cdot 3^b \cdot 5^c = 17$

$6^a \cdot 9^b \cdot 15^c = 153$

$\Rightarrow a + b + c = ?$

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

10. $5^a = 3^b$

$\Rightarrow 9^{\frac{b}{a}} + 125^{\frac{a}{b}} = ?$

A) 8 B) 14 C) 28 D) 52 E) 134

11. $2^x = 13$, $3^y = 15$, $5^z = 17$ $\Rightarrow ? < ? < ?$

A) $x < y < z$ B) $x < z < y$ C) $z < x < y$

D) $z < y < x$ E) $y < x < z$

12. $2^a = 15$, $3^b = 7$, $5^c = 120$ $\Rightarrow ? > ? > ?$

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

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

13. $a = 3^{-2}$, $b = (-2)^{-2}$, $c = -2^{(-2)}$ $\Rightarrow ? < ? < ?$

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

D) $c < a < b$ E) $b < c < a$

14. $a = 4^{60}$, $b = 6^{40}$, $c = 3^{80}$ $\Rightarrow ? < ? < ?$

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

D) $c < a < b$ E) $b < a < c$

15. $25^{2x-3} = 120$

$\Rightarrow ? < x < ?$

A) $2 < x < \frac{9}{4}$ B) $\frac{5}{2} < x < 3$

C) $-\frac{3}{2} < x < \frac{1}{2}$ D) $\frac{3}{4} < x < \frac{7}{4}$

E) $\frac{3}{2} < x < \frac{7}{2}$

16. $x = \left(\frac{1}{2}\right)^{\frac{1}{2}}$ $y = \left(\frac{1}{2}\right)^{\frac{1}{3}}$ $z = \left(\frac{1}{2}\right)^{\frac{1}{7}}$

$\Rightarrow ? < ? < ?$

A) $z < y < x$ B) $z < x < y$ C) $y < x < z$

D) $x < z < y$ E) $x < y < z$

1. $(0{,}027)^{\frac{2}{3}} \cdot (400)^{\frac{1}{2}} = ?$

A) 6 B) $\frac{16}{5}$ C) 3 D) $\frac{9}{4}$ E) $\frac{9}{5}$

2. $\frac{7}{1+19^{13}} + \frac{7}{1+19^{-13}} = ?$

A) 1 B) 7 C) 10 D) 13 E) 19

3. $x, y, z \in Z$

$2^{x+y-4} = 7^{x-1} = 13^{z-2}$

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

A) 4 B) 5 C) 7 D) 10 E) 12

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

$(a-b)^3 \cdot (a+b)^3 = 27$

$\Rightarrow 2a - b = ?$

A) 2 B) 3 C) 4 D) 6 E) 7

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

A) $2^x + 2^y$ B) 2^{x+y} C) 0 D) $2^{x \cdot y}$ E) 2^{x-y}

6. $2^a = 3^b \Rightarrow 4^{\frac{a}{b}} + 9^{\frac{b}{a}} = ?$

A) 4 B) 5 C) 9 D) 13 E) 17

7. $3^{a-1} = 4^{b+1}$

$\Rightarrow 16^{\frac{b+1}{a-1}} + 3^{\frac{a-1}{b+1}} = ?$

A) 3 B) 7 C) 9 D) 13 E) 25

8. $\frac{8}{4^{1+x-y}+4} + \frac{8}{4^{1+y-x}+4} = ?$

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

9. $\frac{2-3x}{x^n}+\frac{3-x^2}{x^{n-1}}+\frac{x}{x^{n-2}}=?$

A) $\frac{x}{x^n}$ B) $\frac{2+x}{x^n}$ C) $\frac{2+x^2}{x^n}$ D) $\frac{3}{x^n}$ E) $\frac{2}{x^n}$

10. $\left.\begin{array}{l}4^a=3\\9^b=5\\125^c=2\end{array}\right\} \Rightarrow a\cdot b\cdot c=?$

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{6}$ D) $\frac{1}{12}$ E) $\frac{1}{24}$

11. $\left.\begin{array}{l}a=2^{100}\\b=3^{75}\\c=5^{50}\end{array}\right\} \Rightarrow ?<?<?$

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

12. $a\in Z^+$

$\left(\frac{2}{3}\right)^{1-a}<\left(\frac{9}{4}\right)^{\frac{a+1}{3}} \Rightarrow \max(a)=?$

A) 6 B) 5 C) 4 D) 2 E) 1

13. $x=\left(\frac{1}{3}\right)^{\frac{1}{2}}$ $y=\left(\frac{1}{3}\right)^{\frac{1}{4}}$ $z=\left(\frac{1}{3}\right)^{\frac{1}{8}}$

$\Rightarrow ?<?<?$

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

14. $\left.\begin{array}{l}x=7^a+2\\y=7^{-a}-2\end{array}\right\} \Rightarrow y=?$

A) $\frac{x-2}{x+2}$ B) $x+2$ C) $x-2$ D) $\frac{5-2x}{x-2}$ E) $\frac{x-5}{x+2}$

15. $x=y^{2a-3b}=z^{2a+3b}$

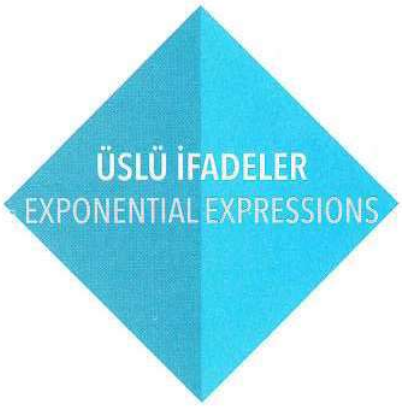
$\Rightarrow (y\cdot z)^{4a^2-9b^2}=?$

A) x^{6b} B) x^{4a} C) x^{2a+3b} D) x^{2a-3b} E) $x^{4a^2-9b^2}$

16. $\frac{x}{y}=\frac{3}{2}$

$x^y=y^x \Rightarrow x=?$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{8}{9}$ D) $\frac{9}{8}$ E) $\frac{27}{8}$



YANIT ANAHTARI | ANSWER KEY

TEST 1

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

TEST 2

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

TEST 3

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

TEST 4

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

TEST 5

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

TEST 6

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

TEST 7

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

TEST 8

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

TEST 9

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

TEST 10

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


KÖKLÜ İFADELER
RADICAL EXPRESSIONS

KÖKLÜ İFADELER

ÖZELLİK | Property 1

Köklü İfadeler | Radicals

$a \in R^+, n \in N \ (n > 1)$

$a^n = b \Rightarrow \sqrt[n]{b} = a$

$\sqrt{a} = \sqrt[2]{a}$

Köklü ifade $\sqrt[n]{b}$ şeklinde gösterilir. n'ye kökün derecesi, a'ya b'nin n. dereceden kökü denir.

A radical is an expression of the form $\sqrt[n]{b}$ which denotes the principal n^{th} root of a where the positive integer n is the index or order of the radical and the number a is the radicand.

1. $\sqrt{16} = ?$ — 4

2. $\sqrt{25} + \sqrt{9} - \sqrt{100} = ?$ — −2

3. $\sqrt{121} - \sqrt{144} + \sqrt{64} = ?$ — 7

4. $\dfrac{\sqrt{9} + \sqrt{16}}{\sqrt{4}} = ?$ — $\dfrac{7}{2}$

5. $\dfrac{\sqrt{81} + \sqrt{4}}{\sqrt{49}} = ?$ — $\dfrac{11}{7}$

6. $\sqrt{9} \cdot \sqrt{100} - \sqrt{196} = ?$ — 16

7. $\sqrt{225} \cdot \sqrt{4} - \sqrt{16} \cdot \sqrt{36} = ?$ — 6

8. $\sqrt{400} \cdot \sqrt{16} - \sqrt{49} = ?$ — 73

9. $\sqrt{25} + \sqrt{289} + \sqrt{256} = ?$ — 38

10. $\sqrt{100} - (\sqrt{25} - \sqrt{256}) = ?$ — 21

11. $\sqrt{225} - [\sqrt{16} - (-\sqrt{169})] = ?$ — −2

12. $\dfrac{\sqrt{64} + \sqrt{9} \cdot \sqrt{100}}{\sqrt{225}} = ?$ — $\dfrac{38}{15}$

13. $\dfrac{\sqrt{9} \cdot \sqrt{16} - \sqrt{225}}{\sqrt{\frac{1}{9}}} = ?$ — −9

14. $\dfrac{\sqrt{81} - \sqrt{289}}{\sqrt{256}} = ?$ — $-\dfrac{1}{2}$

15. $\dfrac{\sqrt{100} - \sqrt{64}}{\sqrt{900}} = ?$ — $\dfrac{1}{15}$

ÖZELLİK | Property 2

$$\sqrt[n]{a^n} \Rightarrow \begin{cases} a & \text{n tek sayı } \textit{(n is odd number)} \\ |a| & \text{n çift sayı } \textit{(n is even number)} \end{cases}$$

1. $\sqrt[3]{8} - \sqrt[3]{27} = ?$ — **−1**

2. $\sqrt[3]{125} - \sqrt{4} + \sqrt[4]{16} = ?$ — **5**

3. $\sqrt[3]{64} - \sqrt[3]{-8} = ?$ — **6**

4. $\sqrt[3]{125} + \sqrt[5]{-32} = ?$ — **3**

5. $\sqrt[3]{27} - \left(-\sqrt[4]{81}\right) = ?$ — **6**

6. $\dfrac{\sqrt[5]{243} - \sqrt[4]{81}}{\sqrt[3]{-8}} = ?$ — **0**

7. $\sqrt{(-2)^2} - \sqrt[3]{(-2)^3} = ?$ — **4**

8. $\sqrt[3]{-27} - \sqrt{(-3)^2} = ?$ — **−6**

9. $\sqrt{6 - \sqrt[3]{8}} = ?$ — **2**

10. $\sqrt[3]{24 + \sqrt[4]{81}} = ?$ — **3**

11. $\sqrt[3]{8} - (\sqrt{16} \cdot \sqrt{9}) = ?$ — **−10**

12. $\sqrt[3]{-216} + \sqrt[3]{64} - \sqrt{64} = ?$ — **−10**

13. $\sqrt[3]{6 \cdot 2 + 15} = ?$ — **3**

14. $\sqrt[4]{77 + 2 \cdot \sqrt{4}} = ?$ — **3**

15. $\dfrac{\sqrt[3]{-8} \cdot \sqrt{4}}{\sqrt[3]{27}} = ?$ — **$-\frac{4}{3}$**

KÖKLÜ İFADELER

ÖZELLİK | Property 3

$a, b \in R^+$

- $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{a \cdot b}$
- $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$
- $\sqrt[n]{a^k} = a^{\frac{k}{n}}$
- $\sqrt[n]{a^m} = \sqrt[k]{a^{\frac{m}{k}}}$
- $\sqrt[n]{a^m} = \sqrt[n \cdot k]{a^{m \cdot k}}$

1. $\sqrt{3} \cdot \sqrt{2} = ?$ — $\sqrt{6}$

2. $\sqrt{3} \cdot \sqrt{2} \cdot \sqrt{6} = ?$ — 6

3. $\sqrt{3} \cdot \sqrt{3} = ?$ — 3

4. $\frac{\sqrt{15} \cdot \sqrt{10}}{\sqrt{6}} = ?$ — 5

5. $\frac{\sqrt{21} \cdot \sqrt{6}}{\sqrt{14}} = ?$ — 3

6. $\frac{\sqrt{105} \cdot \sqrt{7}}{\sqrt{15}} = ?$ — 7

7. $\sqrt[3]{2} \cdot \sqrt[3]{4} = ?$ — 2

8. $\frac{\sqrt[3]{10} \cdot \sqrt[3]{4}}{\sqrt[3]{5}} = ?$ — 2

9. $\frac{\sqrt[4]{54} \cdot \sqrt[4]{3}}{\sqrt[4]{2}} = ?$ — 3

10. $\frac{\sqrt[4]{18} \cdot \sqrt[4]{27}}{\sqrt[4]{6}} = ?$ — 3

11. $\frac{\sqrt[3]{12} \cdot \sqrt[3]{6}}{\sqrt[3]{9}} = ?$ — 2

12. $\sqrt{2} \cdot \sqrt[3]{2} = ?$ — $\sqrt[6]{2^5}$

13. $\sqrt{3} \cdot \sqrt[3]{9} = ?$ — $3 \cdot \sqrt[6]{3}$

14. $\sqrt[3]{5} \cdot \sqrt{2} = ?$ — $\sqrt[6]{200}$

15. $\frac{\sqrt[3]{9} \cdot \sqrt{27}}{\sqrt[6]{81}} = ?$ — $3\sqrt{3}$

ÖZELLİK | Property 4

- $\sqrt[n]{a} \mp \sqrt[n]{b} \neq \sqrt[n]{a \mp b}$
- $a\sqrt[n]{k} + b\sqrt[n]{k} - c\sqrt[n]{k} = (a+b-c)\sqrt[n]{k}$

1. $\sqrt{8} = ?$

$2\sqrt{2}$

2. $\sqrt{32} - \sqrt{8} = ?$

$2\sqrt{2}$

3. $\sqrt{24} + \sqrt{6} = ?$

$3\sqrt{6}$

4. $\sqrt{75} - \sqrt{12} + \sqrt{27} = ?$

$6\sqrt{3}$

5. $\sqrt{18} - \sqrt{2} + \sqrt{32} = ?$

$6\sqrt{2}$

6. $\sqrt[3]{16} + \sqrt[3]{54} = ?$

$5\sqrt[3]{2}$

7. $\sqrt[3]{24} - \sqrt[3]{375} = ?$

$-3 \cdot \sqrt[3]{3}$

8. $\sqrt[3]{32} - \sqrt[3]{500} = ?$

$-3 \cdot \sqrt[3]{4}$

9. $\dfrac{\sqrt[3]{-16} + \sqrt[3]{54}}{\sqrt[3]{2}} = ?$

1

10. $\dfrac{\sqrt{20} - \sqrt{5} + \sqrt{125}}{\sqrt{5}} = ?$

6

11. $\dfrac{\sqrt{75} + \sqrt{48} - \sqrt{147}}{\sqrt{3}} = ?$

2

12. $\dfrac{\sqrt{32} + 3\sqrt{18}}{\sqrt{2}} = ?$

13

13. $\dfrac{\sqrt[3]{3} - \sqrt[3]{24}}{\sqrt[3]{81}} = ?$

$-\dfrac{1}{3}$

14. $\dfrac{\sqrt[5]{-32} + \sqrt[3]{8} - \sqrt[3]{81}}{\sqrt[3]{3}} = ?$

-3

15. $\dfrac{\sqrt{72} - \sqrt{2}}{\sqrt{8}} = ?$

$\dfrac{5}{2}$

KÖKLÜ İFADELER

ÖZELLİK | Property 5

Köklü ifadede bölme işlemi yapılırken paydanın eşleniği ile ifade genişletilerek ifadenin paydası rasyonel yapılır.

In radical expressions, when making rationalizing division, the expression is expanded using the conjugate of the denominator and the denominator is made rational.

$a \in R^+$

- $\sqrt{a}$ nın eşleniği $\sqrt{a}$ (*conjugate of*) $\quad \sqrt{a} \cdot \sqrt{a} = a$
- $\sqrt[n]{a}$ nın eşleniği $\sqrt[n]{a^{n-1}}$ (*conjugate of*) $\quad \sqrt[n]{a} \cdot \sqrt[n]{a^{n-1}} = a$

1. $\frac{4}{\sqrt{2}} = ?$ $\quad 2\sqrt{2}$

2. $\frac{10}{\sqrt{5}} + 2\sqrt{5} = ?$ $\quad 4\sqrt{5}$

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

4. $\frac{4}{\sqrt[3]{2}} = ?$ $\quad 2\sqrt[3]{4}$

5. $\frac{5}{\sqrt[5]{5^3}} = ?$ $\quad \sqrt[5]{5^2}$

6. $4\left(3\sqrt{2} - \frac{1}{\sqrt{2}}\right) = ?$ $\quad 10\sqrt{2}$

7. $3 \cdot \left(\frac{12}{\sqrt{3}} - \frac{5}{\sqrt{3}}\right) = ?$ $\quad 7\sqrt{3}$

8. $1 - \frac{1}{\sqrt{2}} = ?$ $\quad \frac{2-\sqrt{2}}{2}$

9. $1 - \frac{1}{\sqrt{3}} = ?$ $\quad \frac{3-\sqrt{3}}{3}$

10. $\frac{30}{\sqrt{5}} - \frac{15}{\sqrt{5}} + 3\sqrt{5} = ?$ $\quad 6\sqrt{5}$

11. $\left(\frac{5}{\sqrt{2}} + \frac{7}{\sqrt{2}}\right) \cdot 2 = ?$ $\quad 12\sqrt{2}$

12. $\left(4\sqrt{3} - \frac{6}{\sqrt{3}}\right) \cdot 5 = ?$ $\quad 10\sqrt{3}$

13. $\left(\frac{4}{\sqrt{2}} - \frac{3}{\sqrt{2}}\right) \cdot \left(\frac{6}{\sqrt{3}}\right) = ?$ $\quad \sqrt{6}$

14. $\left(\frac{12}{\sqrt{3}} - \frac{5}{\sqrt{3}}\right) \cdot \frac{1}{\sqrt{7}} = ?$ $\quad \frac{\sqrt{21}}{3}$

15. $\left(\frac{9}{\sqrt{3}} - \sqrt{3}\right) \cdot \frac{1}{\sqrt{2}} = ?$ $\quad \sqrt{6}$

ÖZELLİK | Property 6

- $\sqrt{a}+\sqrt{b}$ nin eşleniği $\sqrt{a}-\sqrt{b}$
  $\sqrt{a}+\sqrt{b}$ conjugate of $\sqrt{a}-\sqrt{b}$
- $\sqrt{a}-\sqrt{b}$ nin eşleniği $\sqrt{a}+\sqrt{b}$
  $\sqrt{a}-\sqrt{b}$ conjugate of $\sqrt{a}+\sqrt{b}$

$(\sqrt{a}+\sqrt{b})\cdot(\sqrt{a}-\sqrt{b}) = a-b$

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

2. $\dfrac{4}{\sqrt{5}+1} = ?$ — $\sqrt{5}-1$

3. $\dfrac{2}{(\sqrt{5}-\sqrt{3})} = ?$ — $\sqrt{5}+\sqrt{3}$

4. $\dfrac{1}{\sqrt{6}+\sqrt{5}}+\dfrac{1}{\sqrt{5}+\sqrt{4}} = ?$ — $\sqrt{6}-2$

5. $\dfrac{4}{\sqrt{7}+\sqrt{3}} = ?$ — $\sqrt{7}-\sqrt{3}$

6. $\dfrac{7}{3-\sqrt{2}} = ?$ — $3+\sqrt{2}$

7. $\dfrac{1}{\sqrt{3}+\sqrt{2}}+\dfrac{2}{\sqrt{2}} = ?$ — $\sqrt{3}$

8. $\dfrac{1}{\sqrt{5}-2} = ?$ — $\sqrt{5}+2$

9. $\sqrt{\sqrt{7}-\sqrt{2}}\cdot\sqrt{\sqrt{7}+\sqrt{2}} = ?$ — $\sqrt{5}$

10. $\sqrt{\sqrt{5}-1}\cdot\sqrt{\sqrt{5}+1} = ?$ — 2

11. $\dfrac{3}{\sqrt{5}+\sqrt{2}}+\dfrac{1}{\sqrt{2}+1} = ?$ — $\sqrt{5}-1$

12. $\dfrac{4}{\sqrt{6}-\sqrt{2}}+\dfrac{4}{\sqrt{6}+\sqrt{2}} = ?$ — $2\sqrt{6}$

13. $\dfrac{1}{1+\dfrac{1}{\sqrt{2}}} = ?$ — $2-\sqrt{2}$

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

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

KÖKLÜ İFADELER

ÖZELLİK | Property 7

$r \in Z^+$

- $\sqrt[n]{a^k} = a^{\frac{k}{n}} = a^{\frac{k \cdot r}{n \cdot r}} = \sqrt[n \cdot r]{a^{k \cdot r}}$
- $\sqrt[n]{a^k} = a^{\frac{k}{n}} = a^{\frac{k/r}{n/r}} = \sqrt[n/r]{a^{k/r}}$
- $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{a \cdot b}$
- $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$

1. $\sqrt{3} \cdot \sqrt[3]{9} = 3^x$
$\Rightarrow x = ?$

$\frac{7}{6}$

2. $\sqrt{2} \cdot \sqrt[3]{2} = 2^x$
$\Rightarrow x = ?$

$\frac{5}{6}$

3. $\sqrt{3} \cdot \sqrt[3]{3} \cdot \sqrt[4]{3} = \sqrt[12]{x}$
$\Rightarrow x = ?$

3^{13}

4. $\sqrt{2} \cdot \sqrt[3]{2} = \sqrt[3]{\sqrt{2^x}}$
$\Rightarrow x = ?$

5

5. $\sqrt{5} \cdot \sqrt[3]{25} = \sqrt[6]{5^x}$
$\Rightarrow x = ?$

7

6. $\sqrt[3]{9} \cdot \sqrt{27} = \sqrt{3^x}$
$\Rightarrow x = ?$

$\frac{13}{3}$

7. $\sqrt{2} \cdot \sqrt[3]{2} \cdot \sqrt[6]{2} = \sqrt[3]{\sqrt{x}}$
$\Rightarrow x = ?$

64

ÖZELLİK | Property 8

- $\sqrt[m]{\sqrt[k]{\sqrt[r]{a}}} = \sqrt[m \cdot k \cdot r]{a}$
- $\sqrt[m]{a \sqrt[k]{b \sqrt[r]{c}}} = \sqrt[m]{a} \cdot \sqrt[m \cdot k]{b} \cdot \sqrt[m \cdot k \cdot r]{c}$
- $\sqrt[m]{a \sqrt[k]{b \sqrt[r]{c}}} = \sqrt[m \cdot k \cdot r]{a^{kr} \cdot b^r \cdot c}$

1. $\sqrt[4]{2 \cdot \sqrt{2^{14}}} = x$
$\Rightarrow x = ?$

2^2

2. $\sqrt[3]{2 \cdot \sqrt{2 \cdot \sqrt{8}}} = ?$

$2^{\frac{3}{4}}$

3. $\sqrt{5 \cdot \sqrt[3]{5 \cdot \sqrt{25}}} = 5^x$
$\Rightarrow x = ?$

$\frac{5}{6}$

4. $\sqrt[4]{3 \cdot \sqrt{3 \cdot \sqrt[3]{9}}} = 3^x$
$\Rightarrow x = ?$

$\frac{11}{24}$

5. $\sqrt{\sqrt{2}} = 4^x$
$\Rightarrow x = ?$

$\frac{1}{16}$

6. $\sqrt{\sqrt[3]{3}} = \sqrt[4]{x}$
$\Rightarrow x = ?$

$\sqrt[3]{9}$

7. $\sqrt{4 \sqrt[3]{8 \sqrt{2}}} = 2^x$
$\Rightarrow x = ?$

$\frac{19}{12}$

8. $\sqrt[4]{2 \cdot \sqrt[3]{2}} = 2^x$
$\Rightarrow x = ?$

$\frac{1}{3}$

ÖZELLİK | Property 9

$\sqrt{a \mp 2\sqrt{b}}$

$m \quad n$

$m \cdot n = b$ ve *(and)* $a = m + n$

$\Rightarrow \sqrt{a+2\sqrt{b}} = \sqrt{m} + \sqrt{n}$

$\sqrt{a-2\sqrt{b}} = \sqrt{m} - \sqrt{n} \quad (m > n)$

1. $\sqrt{3+2\sqrt{2}} = ?$

$\sqrt{2}+1$

2. $\sqrt{5-2\sqrt{6}} = ?$

$\sqrt{3}-\sqrt{2}$

3. $\sqrt{6-2\sqrt{5}}+1 = ?$

$\sqrt{5}$

4. $\sqrt{7+2\sqrt{6}}+\sqrt{7-2\sqrt{6}} = ?$

$2\sqrt{6}$

5. $\sqrt{4+\sqrt{12}} = ?$

$\sqrt{3}+1$

6. $\sqrt{5-\sqrt{24}} = ?$

$\sqrt{3}-\sqrt{2}$

7. $\sqrt{8-4\sqrt{3}} = ?$

$\sqrt{6}-\sqrt{2}$

8. $\sqrt{11+6\sqrt{2}} = ?$

$3+\sqrt{2}$

9. $\sqrt{7+4\sqrt{3}}+\sqrt{7-4\sqrt{3}} = ?$

4

10. $\sqrt{9+4\sqrt{5}}-2 = ?$

$\sqrt{5}$

11. $\sqrt{9-6\sqrt{2}} = ?$

$\sqrt{6}-\sqrt{3}$

12. $\sqrt{x+1+2\sqrt{x}} = \sqrt{15}+1$

$\Rightarrow x = ?$

15

13. $a > 3$

$\sqrt{a+3-2\sqrt{3\cdot a}}+\sqrt{3} = 7$

$\Rightarrow a = ?$

49

14. $\sqrt{2+\sqrt{3}}-\sqrt{2-\sqrt{3}} = ?$

$\sqrt{2}$

15. $\sqrt{4-\sqrt{7}}-\sqrt{4+\sqrt{7}} = ?$

$-\sqrt{2}$

KÖKLÜ İFADELER

ÖZELLİK | Property 10

Sonsuz İfadeler | Infinite Expressions

- $\sqrt{a\cdot\sqrt{a\cdot\sqrt{a\cdot\ldots}}} = a$
- $\sqrt[n]{a\cdot\sqrt[n]{a\cdot\sqrt[n]{a\cdot\ldots}}} = \sqrt[n-1]{a}$
- $\sqrt[n]{a:\sqrt[n]{a:\sqrt[n]{a:\ldots}}} = \sqrt[n+1]{a}$
- a = n(n + 1) olmak üzere
  Let a = n(n + 1)
  $\sqrt{a+\sqrt{a+\sqrt{a+\ldots}}} = n+1$
- $\sqrt{a+\sqrt{a+\sqrt{a+\ldots}}} = \dfrac{\sqrt{4a+1}+1}{2}$
- a = n(n + 1) olmak üzere
  Let a = n(n + 1)
  $\sqrt{a-\sqrt{a-\sqrt{a-\ldots}}} = n$
- $\sqrt{a-\sqrt{a-\sqrt{a-\ldots}}} = \dfrac{\sqrt{4a+1}-1}{2}$

1. $\sqrt{3\cdot\sqrt{3\cdot\sqrt{3\cdot\ldots}}} = ?$ — 3

2. $\sqrt[3]{64\cdot\sqrt[3]{64\cdot\sqrt[3]{64\cdot\ldots..}}} = ?$ — 8

3. $\sqrt{125:\sqrt{125:\sqrt{125:\sqrt{125:\ldots..}}}} = ?$ — 5

4. $\sqrt{72+\sqrt{72+\sqrt{72+\ldots}}} = ?$ — 9

5. $\sqrt{42-\sqrt{42-\sqrt{42-\ldots}}} = ?$ — 6

6. $\dfrac{\sqrt[4]{8\cdot\sqrt[4]{8\cdot\sqrt[4]{8\cdot\ldots..}}}}{\sqrt{8:\sqrt{8:\sqrt{8:\ldots..}}}} = ?$ — 1

7. $\dfrac{\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+\ldots..}}}}}{\sqrt{2-\sqrt{2-\sqrt{2-\sqrt{2-\ldots..}}}}} = ?$ — 3

8. $\dfrac{\sqrt{12+\sqrt{12+\sqrt{12+\ldots}}}}{\sqrt{6-\sqrt{6-\sqrt{6-\ldots}}}} = ?$ — 2

9. $\sqrt{x+\sqrt{x+\sqrt{x+\ldots}}} = 6$
$\Rightarrow x = ?$ — 30

10. $\sqrt{2\cdot\sqrt{5\cdot\sqrt{2\cdot\sqrt{5\cdot\ldots}}}} = ?$ — $\sqrt[3]{20}$

11. $\sqrt[3]{3\sqrt{2\sqrt[3]{3\sqrt{2\ldots}}}} = ?$ — $\sqrt[5]{18}$

12. $\sqrt{a+\sqrt{1+\sqrt{a+\sqrt{1+\ldots..}}}} = 2$
$\Rightarrow a = ?$ — $4-\sqrt{3}$

13. $\sqrt{x+\sqrt{2+\sqrt{x+\sqrt{2+\ldots..}}}} = 2$
$\Rightarrow x = ?$ — 2

14. $\sqrt{5+\sqrt{12+\sqrt{12+\sqrt{12+\ldots}}}} = ?$ — 3

15. $\sqrt{5-\sqrt{11+\sqrt{20+\sqrt{20+\sqrt{20+\ldots}}}}} = ?$ — 1

ÖZELLİK | Property 11

Köklü İfadelerde Sıralama
Ordering in Radical Expressions

Kök dereceleri eşit olan köklü ifadelerde, kök içi büyük olan en büyüktür. Kök dereceleri eşit değil ise eşit duruma getirilip sonra sıralama yapılır.

If the power of the radicals are equal, the order is made with respect to increasing order. If the power of the radicals are not equal the order is made with respect to the same equality.

- $a > b > c > 0$

  $\sqrt[m]{a} > \sqrt[m]{b} > \sqrt[m]{c}$

Aşağıdaki ifadeleri büyükten küçüğe sıralayınız.
Write the following radicals in increasing order.

1. $a = \sqrt{5}$
$b = \sqrt{8}$
$c = \sqrt{6}$

b > c > a

2. $a = \sqrt[3]{12}$
$b = \sqrt[3]{17}$
$c = \sqrt[3]{7}$

b > a > c

3. $x = \sqrt{2}$
$y = \sqrt[3]{3}$
$z = \sqrt[4]{5}$

z > y > x

4. $a = 3\sqrt{5}$
$b = 4\sqrt{2}$
$c = 2\sqrt{11}$

a > c > b

5. $x = \sqrt{3}$
$y = \sqrt[3]{5}$
$z = \sqrt[6]{13}$

x > y > z

6. $0 < a < 1$
$x = \sqrt{a}$
$y = \sqrt[3]{a}$
$z = \sqrt[6]{a}$

z > y > x

7. $x = -3\sqrt{5}$
$y = -2\sqrt{6}$
$z = -4\sqrt{2}$

y > z > x

8. $a = \dfrac{1}{\sqrt[3]{10}}$
$b = \dfrac{1}{\sqrt{6}}$
$c = \dfrac{1}{\sqrt[6]{75}}$

c > a > b

9. $x = -\dfrac{1}{\sqrt{10}}$
$y = -\dfrac{1}{\sqrt{15}}$
$z = -\dfrac{1}{\sqrt{6}}$

y > x > z

KÖKLÜ İFADELER

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

1. $\sqrt{(-5)^2} + \sqrt[3]{(-2)^3} + \sqrt[3]{64} = ?$

7

2. $\sqrt{(1-\sqrt{7})^2} + \sqrt{(\sqrt{7}-3)^2} = ?$

2

3. $x < 0 < y$

$$\Rightarrow \frac{\sqrt{x^2} + \sqrt[4]{y^4}}{\sqrt[5]{x^5} - \sqrt[3]{y^3}} = ?$$

−1

4. $\sqrt{2 + \sqrt[3]{5 + \sqrt{11 - \sqrt{x+1}}}} = 2$

$\Rightarrow x = ?$

3

5. $\dfrac{3\sqrt{2} - 2\sqrt{3}}{\sqrt{3} - \sqrt{2}} = ?$

$\sqrt{6}$

6. $A \in R$

$$A = \frac{\sqrt{x-2} + x + 3}{\sqrt{4 - 2x + x - 1}}$$

$\Rightarrow A = ?$

5

7. $x = \dfrac{\sqrt{5} - 2}{\sqrt{7} + \sqrt{3}}$

$$\Rightarrow \frac{\sqrt{7} - \sqrt{3}}{\sqrt{5} + 2}$$

ifadesinin x türünden ifadesi nedir?

What is the value of $\dfrac{\sqrt{7} - \sqrt{3}}{\sqrt{5} + 2}$ *in terms of x?*

4x

8. $x + \sqrt{x} = 13$

$$\Rightarrow x + \frac{13}{\sqrt{x}} = ?$$

14

ÖRNEK SORU TÜRLERİ EXEMPLARY QUESTION TYPES

9. $0 < x < 1$

$a = x\sqrt{x}$

$b = \sqrt{x \cdot \sqrt{x}}$

$c = \sqrt[3]{x^2}$

$a < b < c$

10. $x = \sqrt{5} - 2$

$\Rightarrow x \cdot (x+1) \cdot (x+3) \cdot (x+4) = ?$

4

11. $x, y \in Q$

$\frac{1}{\sqrt{8-2\sqrt{7}}} = x + y\sqrt{7}$

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

$\frac{1}{18}$

12. $\sqrt[3]{2^{6-9x} + \frac{19}{8^{3x-1}}} = 48$

$\Rightarrow x = ?$

-1

13. $y < 0$

$\Rightarrow \sqrt{-3y \cdot \sqrt{-9y \cdot \sqrt[5]{-y^5}}} = ?$

$-3y$

14. $\frac{1}{\sqrt{1}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{7}} + \ldots + \frac{1}{\sqrt{47}+\sqrt{49}} = ?$

3

15. $\sqrt[4]{3} + 1 = x$

$\Rightarrow \frac{(\sqrt[8]{3}-1) \cdot (\sqrt[8]{3}+1)}{\sqrt{3}-1} = ?$

$\frac{1}{x}$

16. $\sqrt{3+\sqrt{5}} + \sqrt{3-\sqrt{5}} = ?$

$\sqrt{10}$

KÖKLÜ İFADELER

TEST 1

1. $\sqrt{16} + \sqrt{81} - \sqrt{25} = ?$

A) 10 B) 8 C) 5 D) 4 E) 1

2. $\frac{\sqrt{25}}{10} - \frac{\sqrt{16}}{5} + \frac{\sqrt{9}}{10} = ?$

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

3. $\sqrt{144} + \sqrt{225} + 5\sqrt[3]{-64} = ?$

A) -9 B) -7 C) 0 D) 4 E) 7

4. $\sqrt[4]{16} + \sqrt[3]{27} - \sqrt{64} = ?$

A) -4 B) -3 C) 1 D) $\sqrt[4]{2} + 3$ E) $-6 + \sqrt[3]{27}$

5. $\sqrt{64} - \sqrt[3]{-125} + \sqrt[4]{16^3} = ?$

A) 20 B) 21 C) 25 D) 29 E) 32

6. $\sqrt{(-5)^2} + \sqrt[3]{(-7)^3} = ?$

A) 12 B) 6 C) 2 D) -2 E) -12

7. $\sqrt{25} + \sqrt[3]{-8} + \sqrt[3]{27} = ?$

A) 10 B) 8 C) 6 D) 4 E) 0

8. $\sqrt[4]{(-4)^2} + \sqrt[5]{-7^5} + \sqrt{9} = ?$

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

9. $\sqrt{0,36} - \sqrt{0,16} = ?$

A) 0,02 B) 0,2 C) 0,4 D) 0,8 E) 1

10. $\sqrt{(-3)^2} + \sqrt{(-1)^2} - \sqrt{16} = ?$

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

11. $\sqrt{12^{-1} \cdot (2^3 - 5)} = ?$

A) $\frac{1}{12}$ B) $\frac{1}{8}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

12. $\sqrt{15 \cdot 42 \cdot 70} = ?$

A) 30 B) 42 C) 70 D) 140 E) 210

13. $\sqrt[3]{2^2 \cdot 16^2 \cdot 4^4} = ?$

A) 2^{16} B) 2^{15} C) 2^{12} D) 2^9 E) 2^6

14. $\sqrt{1+\frac{9}{16}} + \sqrt{1-\frac{5}{9}} = ?$

A) $\frac{5}{3}$ B) $\frac{11}{6}$ C) $\frac{23}{12}$ D) 2 E) $\frac{25}{12}$

15. $\sqrt{1-\frac{9}{25}} + \sqrt{1-\frac{7}{16}} = ?$

A) $\frac{3}{5}$ B) $\frac{5}{4}$ C) $\frac{29}{30}$ D) $\frac{31}{20}$ E) $\frac{8}{5}$

16. $\sqrt{8-\frac{7}{4}} - \sqrt{3-\frac{3}{4}} = ?$

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

KÖKLÜ İFADELER

TEST 2

1. $\sqrt{\frac{1}{9}\cdot\frac{1}{16}} = ?$

A) $\frac{1}{18}$ B) $\frac{1}{12}$ C) $\frac{1}{6}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

2. $\sqrt{\frac{1}{9}+\frac{1}{16}} = ?$

A) $\frac{1}{12}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{5}{12}$

3. $\sqrt{6}\cdot\sqrt{15}\cdot\sqrt{10} = ?$

A) 30 B) 24 C) 18 D) 12 E) 10

4. $\sqrt{6}\cdot\sqrt{21}\cdot\sqrt{14} = ?$

A) 36 B) 42 C) 49 D) 126 E) 144

5. $\sqrt{5-\frac{1}{2}}\cdot\sqrt{2} = ?$

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

6. $\sqrt{3^2+4^2+12^2} = ?$

A) 8 B) 10 C) 13 D) 15 E) 19

7. $\frac{35}{\sqrt{3^2+4^2}} = ?$

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

8. $\frac{20}{\sqrt{6^2+8^2}} = ?$

A) 1 B) 2 C) 4 D) 5 E) 10

9. $\sqrt{1\frac{5}{4}-\frac{8}{9}} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{7}{6}$ D) $\frac{3}{2}$ E) 2

10. $\sqrt{\frac{1}{25}+\frac{1}{144}} = ?$

A) $\frac{1}{60}$ B) $\frac{1}{30}$ C) $\frac{13}{60}$ D) $\frac{1}{12}$ E) $\frac{1}{10}$

11. $\sqrt{\frac{1}{4}+\frac{1}{16}+1\frac{1}{4}} = ?$

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

12. $\frac{\sqrt{15}\cdot\sqrt{77}\cdot\sqrt{35}}{\sqrt{33}} = ?$

A) 15 B) 21 C) 25 D) 35 E) 77

13. $\sqrt{(1-\sqrt{2})^2}\cdot(1+\sqrt{2}) = ?$

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

14. $\sqrt{(2-\sqrt{5})^2}+\sqrt{5} = ?$

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

15. $\sqrt{(2-\sqrt{7})^2}-\sqrt{7} = ?$

A) $-2\sqrt{7}$ B) -2 C) 2 D) $2\sqrt{7}$ E) $4\sqrt{7}$

16. $x < y < 0 < z$

$\Rightarrow \sqrt{z^2}-\sqrt[3]{y^3}+\sqrt[4]{x^4} = ?$

A) $z+y-x$ B) $z+y+x$ C) $z-y+x$ D) $z-y-x$ E) $x-y-z$

1. $\sqrt{4!} \cdot \sqrt{3!} = ?$

A) $3! \cdot 4$ B) 6 C) 12 D) 26 E) 30

2. $\sqrt{47 + \sqrt[3]{3 + \sqrt{25}}} = ?$

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

3. $\sqrt[3]{66 - \sqrt[3]{3 + \sqrt{25}}} = ?$

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

4. $\sqrt[3]{5 + \sqrt{12 - \sqrt[3]{27}}} = ?$

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

5. $\sqrt[3]{-23 + \sqrt[3]{-72 + \sqrt{64}}} = ?$

A) –3 B) –2 C) –1 D) 1 E) 2

6. $\sqrt{1 + \sqrt{3 + 3\sqrt{2 + \sqrt[3]{8}}}} = ?$

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

7. $\sqrt{37 + \sqrt[3]{5 - \sqrt{29 + \sqrt{3x - 2}}}} = 6$

$\Rightarrow x = ?$

A) 21 B) 19 C) 18 D) 17 E) 16

8. $\sqrt{12} - \sqrt{75} + \sqrt{48} = ?$

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

9. $\sqrt{75}+\sqrt{48}-\sqrt{27}=?$

A) $12\sqrt{3}$ B) $9\sqrt{3}$ C) $6\sqrt{3}$ D) 9 E) $3\sqrt{3}$

10. $\sqrt{2}\cdot(\sqrt{8}+\sqrt{2})+\sqrt{3}\cdot(\sqrt{27}-\sqrt{12})=?$

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

11. $\sqrt{3}\cdot(\sqrt{27}-\sqrt{3})+\sqrt{5}\cdot(\sqrt{45}+\sqrt{5})=?$

A) 15 B) 18 C) 23 D) 26 E) 29

12. $\sqrt{20}\cdot\sqrt{2+\sqrt{(-3)^2}}=?$

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

13. $\dfrac{\sqrt{27}+\sqrt{12}}{\sqrt{3}}=?$

A) 2 B) 3 C) 4 D) 5 E) 6

14. $\dfrac{\sqrt{63}+\sqrt{28}}{\sqrt{7}}=?$

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

15. $\dfrac{4\sqrt{18}+\sqrt{8}-\sqrt{50}}{\sqrt{72}}=?$

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

16. $\dfrac{2\sqrt{72}-3\sqrt{50}}{\sqrt{18}}=?$

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

1. $\frac{\sqrt{40}\cdot\sqrt{18}}{\sqrt{80}} = ?$

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

2. $\frac{2}{\sqrt{5}}(\sqrt{20}+\sqrt{45}) = ?$

A) 2 B) 5 C) 7 D) 10 E) 20

3. $\frac{\sqrt{8}+\sqrt{18}+\sqrt{50}}{\sqrt{32}+\sqrt{2}} = ?$

A) $\sqrt{2}$ B) 2 C) $2\sqrt{2}$ D) 4 E) $4\sqrt{2}$

4. $\frac{\sqrt{63}-\sqrt{28}}{\sqrt{112}} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{\sqrt{7}}{4}$ D) $\frac{\sqrt{7}}{2}$ E) $\sqrt{7}$

5. $\frac{\sqrt{18}+\sqrt{27}}{\sqrt{2}+\sqrt{3}} = ?$

A) 2 B) 3 C) $\sqrt{3}$ D) $2\sqrt{3}$ E) $3\sqrt{3}$

6. $\frac{7\sqrt{2}}{\sqrt{200}}+\frac{\sqrt{27}}{\sqrt{300}} = ?$

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

7. $\frac{300}{\sqrt{900}}+\frac{\sqrt{100}}{10} = ?$

A) 32 B) 20 C) 12 D) 11 E) 2

8. $\frac{\sqrt{45}+\sqrt{20}-\sqrt{5}}{\sqrt{125}-\sqrt{80}} = ?$

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

9. $(\sqrt{7}-\sqrt{5})\cdot(\sqrt{7}+\sqrt{5})=?$

A) 2 B) 5 C) 7 D) 11 E) 12

10. $\frac{6}{\sqrt{3}}=?$

A) $\sqrt{2}$ B) 2 C) 3 D) $2\sqrt{3}$ E) $3\sqrt{2}$

11. $\frac{24}{\sqrt{6}}=?$

A) $\sqrt{6}$ B) $2\sqrt{6}$ C) $4\sqrt{6}$ D) 6 E) 24

12. $\frac{\sqrt{3}\cdot\sqrt{3}}{\sqrt{3}+\sqrt{3}}=?$

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

13. $\frac{\sqrt{32}+\sqrt{8}-\sqrt{2}}{\sqrt{5}}=?$

A) $\sqrt{10}$ B) $\sqrt{5}$ C) $\sqrt{2}$ D) 1 E) 0

14. $\frac{16}{\sqrt{2}}+3\sqrt{2}=?$

A) $3\sqrt{3}$ B) $4\sqrt{2}$ C) $\frac{5\sqrt{2}}{2}$ D) $11\sqrt{2}$ E) $15\sqrt{2}$

15. $\left(\frac{6}{\sqrt{2}}+\frac{10}{\sqrt{2}}\right)\cdot\sqrt{18}=?$

A) 18 B) 24 C) 36 D) 48 E) 54

16. $\frac{\sqrt{48}-\sqrt{12}}{\sqrt{24}}=?$

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

1. $\frac{4}{\sqrt{5}-3} = ?$

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

2. $\frac{\sqrt{45}+\sqrt{35}}{\sqrt{5}} - \frac{7}{\sqrt{7}} = ?$

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

3. $\frac{2}{\sqrt{7}-\sqrt{5}} - \frac{5}{\sqrt{5}} = ?$

A) 1 B) $\sqrt{2}$ C) $\sqrt{3}$ D) $\sqrt{5}$ E) $\sqrt{7}$

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

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

5. $\frac{6}{\sqrt{2}} - \frac{3}{\sqrt{3}} + \frac{3}{\sqrt{3}+\sqrt{2}} = ?$

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

6. $\frac{2}{\sqrt{7}+\sqrt{5}} + \frac{2}{\sqrt{5}-\sqrt{3}} = ?$

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

7. $\frac{15}{\sqrt{7}-2} - \frac{21}{\sqrt{7}} = ?$

A) -6 B) $-6-6\sqrt{7}$ C) $2\sqrt{7}+10$ D) 6 E) $6+6\sqrt{7}$

8. $\frac{1}{\sqrt{3}-1} + \frac{1}{\sqrt{3}+1} = ?$

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

9. $\frac{14}{5-3\sqrt{2}} - \frac{6}{\sqrt{2}} = ?$

A) $10+3\sqrt{2}$ B) $7+\sqrt{2}$ C) $10-6\sqrt{2}$ D) $6\sqrt{2}$ E) $5+3\sqrt{2}$

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

A) $4\sqrt{2}$ B) $3\sqrt{2}$ C) 6 D) -6 E) $-4\sqrt{2}$

11. $\frac{1}{3-\sqrt{8}} + \frac{1}{3+2\sqrt{2}} = ?$

A) 2 B) 3 C) 4 D) 6 E) 8

12. $\frac{6}{\sqrt{5}-\sqrt{2}} - \frac{9}{\sqrt{5}+\sqrt{2}} - \frac{10}{\sqrt{2}} = ?$

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

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

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

14. $2\sqrt{3}\cdot 3\sqrt{2} + 3\sqrt{2} : \sqrt{3} = ?$

A) $7\sqrt{6}$ B) $6\sqrt{6}$ C) 6 D) $\sqrt{6}$ E) $\sqrt{3}$

15. $\frac{4}{\sqrt[3]{2}} = ?$

A) $2\sqrt[3]{2}$ B) $2\sqrt{2}$ C) $2\sqrt[3]{4}$ D) 4 E) $4\sqrt[3]{2}$

16. $2\sqrt{\frac{3}{2}} + 3\sqrt{\frac{2}{3}} = ?$

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

1. $\dfrac{6}{\sqrt{3}+\dfrac{3}{\sqrt{3}}} = ?$

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

2. $\left(\sqrt{3}+\dfrac{1}{\sqrt{3}}\right)\cdot\left(\sqrt{2}+\dfrac{1}{\sqrt{2}}\right) = ?$

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

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

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

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

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

5. $\dfrac{1}{2-\dfrac{4}{\sqrt{2}}}+\dfrac{1}{2+\dfrac{4}{\sqrt{2}}} = ?$

A) –1 B) 1 C) $\sqrt{2}$ D) 2 E) $2\sqrt{2}$

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

A) $2+\sqrt{3}$ B) $2-\sqrt{3}$ C) $\sqrt{3}$ D) 2 E) 4

7. $\dfrac{1}{\sqrt{5}+\sqrt{6}}+\dfrac{1}{\sqrt{6}+\sqrt{7}}+\dfrac{1}{\sqrt{7}+\sqrt{8}} = ?$

A) $2\sqrt{2}-\sqrt{5}$ B) $\sqrt{5}-1$ C) $4-\sqrt{5}$ D) $\sqrt{5}$ E) $2\sqrt{5}$

8. $\dfrac{1+\sqrt{2}+\sqrt{3}+\sqrt{6}}{1+\sqrt{3}} = ?$

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

9. $\frac{\sqrt{3}-1}{\sqrt{15}-\sqrt{5}+\sqrt{3}-1}-\frac{1}{\sqrt{5}-1}=?$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) 0 D) $\frac{\sqrt{5}}{4}$ E) $\frac{\sqrt{5}}{2}$

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

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

11. $\frac{5\sqrt{3}-\sqrt{50}}{\sqrt{15}-\sqrt{10}}=?$

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

12. $2\sqrt{45}+3\sqrt{20}=x\sqrt{5}$
$\Rightarrow x=?$

A) 2 B) 4 C) 6 D) 12 E) 36

13. $\frac{1}{\sqrt{0,09}}+\frac{1}{\sqrt{0,04}}-\frac{1}{\sqrt{0,01}}=?$

A) $-\frac{3}{4}$ B) $-\frac{5}{4}$ C) $-\frac{5}{3}$ D) $\frac{2}{5}$ E) $\frac{3}{7}$

14. $\frac{\sqrt{3}\cdot\sqrt{12}}{\sqrt{0,04}+\sqrt{0,25}}=?$

A) 2 B) $\frac{50}{7}$ C) $\frac{60}{7}$ D) 9 E) $\frac{47}{5}$

15. $\frac{\sqrt{1,44}+\sqrt{0,09}}{\sqrt{0,25}}=?$

A) 1 B) $\frac{3}{5}$ C) $\frac{3}{25}$ D) 3 E) 5

16. $\frac{\sqrt{1,44}+\sqrt{0,09}}{\sqrt{0,64}+\sqrt{0,01}}=?$

A) $\frac{3}{\sqrt{10}}$ B) $\frac{3}{10}$ C) $5\sqrt{10}$ D) $\frac{5\sqrt{10}}{3}$ E) $\frac{5}{3}$

1. $\sqrt[3]{16} + \sqrt[3]{54} = ?$

A) $5\sqrt[3]{2}$ B) $5\sqrt{2}$ C) 5 D) $3\sqrt{5}$ E) $3\sqrt[3]{5}$

2. $\sqrt[3]{-54} + \sqrt[3]{16} = ?$

A) –2 B) $-\sqrt[3]{2}$ C) 1 D) 2 E) $\sqrt[3]{2}$

3. $\sqrt[3]{128} + 3 \cdot \sqrt[3]{54} - \sqrt[3]{2} = ?$

A) $\sqrt[3]{2}$ B) 2 C) $6\sqrt[3]{2}$ D) 12 E) $12\sqrt[3]{2}$

4. $\dfrac{\sqrt[3]{54} + \sqrt[3]{128}}{\sqrt[3]{16}} = ?$

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

5. $\sqrt[3]{0,027} + \sqrt[4]{0,0016} = ?$

A) 0,1 B) 0,2 C) 0,3 D) 0,4 E) 0,5

6. $\sqrt{0,25} + \sqrt{0,04} + \sqrt[3]{0,008} = ?$

A) 1 B) 0,9 C) 0,8 D) 0,6 E) 0,5

7. $\sqrt{\sqrt{13} - 3} \cdot \sqrt{\sqrt{13} + 3} = ?$

A) 1 B) 2 C) 3 D) 4 E) 9

8. $\sqrt{\sqrt{19} + \sqrt{15}} \cdot \sqrt{\sqrt{19} - \sqrt{15}} = ?$

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

9. $\sqrt{(5\sqrt{2}-1)(5\sqrt{2}+1)} = ?$

A) 4 B) 5 C) 7 D) 9 E) 11

10. $\sqrt{6+\sqrt{11}} \cdot \sqrt{6-\sqrt{11}} = ?$

A) 2 B) 5 C) 6 D) 10 E) 11

11. $\sqrt{(\sqrt{8}-2)} \cdot \sqrt{(2+2\sqrt{2})} = ?$

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

12. $\sqrt{\sqrt{8}-\sqrt{3}} \cdot \sqrt{\sqrt{8}+\sqrt{3}} \cdot \sqrt{5} = ?$

A) $\sqrt{3}$ B) $\sqrt{5}$ C) $\sqrt{15}$ D) 5 E) 15

13. $\sqrt[6]{81 \cdot 9 \cdot \left(\frac{1}{9}\right)^{-3}} = ?$

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

14. $3^x \cdot 9^x = \sqrt[3]{81} \Rightarrow x = ?$

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

15. $\sqrt[3]{\frac{81}{\sqrt[3]{27}}} = 3^x \Rightarrow x = ?$

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

16. $\frac{\sqrt{4^{x+3}}}{\sqrt[3]{2^{3x+y}}} = 16 \Rightarrow y = ?$

A) -3 B) -1 C) 2 D) 4 E) 6

KÖKLÜ İFADELER

TEST 8

1. $\sqrt{5+2\sqrt{6}} - \sqrt{2} = ?$

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

2. $\sqrt{8-2\sqrt{7}} + \sqrt{8+2\sqrt{7}} = ?$

A) $2\sqrt{7}$ B) 2 C) 1 D) -2 E) $-2\sqrt{7}$

3. $\sqrt{8+2\sqrt{7}} - \sqrt{11-2\sqrt{28}} = ?$

A) $\sqrt{7}+1$ B) $2\sqrt{7}$ C) $\sqrt{11}$ D) 3 E) 1

4. $\sqrt{12+2\sqrt{11}} - \sqrt{12-2\sqrt{11}} = ?$

A) -2 B) 2 C) $2\sqrt{2}$ D) 4 E) $2\sqrt{22}$

5. $\sqrt{5-2\sqrt{6}} \cdot \sqrt{5+2\sqrt{6}} = ?$

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

6. $\sqrt{(\sqrt{7}-\sqrt{2}) \cdot \sqrt{9+2\sqrt{14}}} = ?$

A) 2 B) $\sqrt{5}$ C) $2\sqrt{2}$ D) $2\sqrt{7}$ E) 7

7. $\sqrt{4-\sqrt{12}} + 1 = ?$

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

8. $\sqrt{4-\sqrt{12}} : (\sqrt{3}+1) = ?$

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

9. $\sqrt{11+\sqrt{40}}-\sqrt{10}=?$

A) 2 B) 1 C) $-2\sqrt{10}+1$ D) $-2\sqrt{10}$ E) $-\sqrt{10}$

10. $\sqrt{7-\sqrt{40}}\cdot\sqrt{7+\sqrt{40}}=?$

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

11. $\sqrt{9+4\sqrt{5}}-\frac{5}{\sqrt{5}}=?$

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

12. $\sqrt{7-4\sqrt{3}}+\sqrt{7+4\sqrt{3}}=?$

A) 2 B) $2\sqrt{3}$ C) 4 D) $4+2\sqrt{3}$ E) $4\sqrt{3}$

13. $\sqrt{14+6\sqrt{5}}-\frac{10}{\sqrt{5}}=?$

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

14. $\sqrt{1+\sqrt{3-\sqrt{8}}}-\sqrt{-1+\sqrt{3+\sqrt{8}}}=?$

A) 0 B) 1 C) $\sqrt[4]{2}$ D) $\sqrt{2}$ E) 2

15. $(\sqrt{7}-\sqrt{3})\cdot\sqrt{5+\sqrt{21}}=?$

A) 2 B) $2\sqrt{2}$ C) 4 D) 5 E) 7

16. $\sqrt{4+\sqrt{15}}-\sqrt{4-\sqrt{15}}=?$

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

1. $\sqrt[3]{4} \cdot \sqrt{2} = ?$

A) $2\sqrt[6]{2}$ B) $\sqrt[6]{2}$ C) $2\sqrt[3]{2}$ D) $\sqrt[3]{2}$ E) $\sqrt[3]{4}$

2. $\sqrt{2} \cdot \sqrt[3]{2} \cdot \sqrt[6]{2} = ?$

A) $\sqrt[3]{4}$ B) $\sqrt[6]{2^5}$ C) 2 D) $2\sqrt{2}$ E) $2\sqrt[3]{2}$

3. $\sqrt{3} \cdot \sqrt[3]{9} \cdot \sqrt[4]{\frac{1}{81}} = ?$

A) $\sqrt[3]{3}$ B) $3\sqrt[3]{3}$ C) $\sqrt[6]{3}$ D) $\sqrt[3]{9}$ E) $\sqrt[12]{3}$

4. $\sqrt[5]{\sqrt[3]{\sqrt{3}}} = ?$

A) $3^{\frac{1}{5}}$ B) $3^{\frac{1}{10}}$ C) $3^{\frac{1}{15}}$ D) $3^{\frac{1}{20}}$ E) $3^{\frac{1}{30}}$

5. $\sqrt{2\sqrt[3]{2\sqrt[4]{2}}} = ?$

A) $2^{\frac{5}{24}}$ B) $2^{\frac{1}{2}}$ C) $2^{\frac{17}{24}}$ D) $2^{\frac{5}{6}}$ E) $2^{\frac{23}{24}}$

6. $\sqrt{2\sqrt[3]{2\sqrt{2}}} = ?$

A) $2^{\frac{1}{12}}$ B) $2^{\frac{1}{6}}$ C) $2^{\frac{1}{4}}$ D) $2^{\frac{3}{4}}$ E) 2

7. $\sqrt[3]{\sqrt{3} \cdot \sqrt[3]{2}} = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt[6]{2}$ D) $\sqrt[6]{3}$ E) $\sqrt[6]{6}$

8. $\sqrt[3]{9\sqrt{3^4\sqrt{3^{-4}}}} = 3^x \Rightarrow x = ?$

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

9. $\dfrac{\sqrt{\sqrt[3]{\sqrt{8}}}}{\sqrt{2\sqrt{4\sqrt{2}}}} = 2^x$

$\Rightarrow x = ?$

A) $-\frac{3}{8}$ B) $-\frac{1}{2}$ C) $-\frac{5}{8}$ D) $-\frac{3}{4}$ E) $-\frac{7}{8}$

10. $\sqrt[4]{2\sqrt{3}} = \sqrt[8]{3x}$

$\Rightarrow x = ?$

A) $\sqrt[4]{2}$ B) $\sqrt[3]{2}$ C) $\sqrt{2}$ D) $2\sqrt{2}$ E) 4

11. $\sqrt{2\sqrt[3]{x}} = \sqrt[3]{9\sqrt{8}}$

$\Rightarrow x = ?$

A) 36 B) 54 C) 64 D) 72 E) 81

12. $\sqrt[4]{8\sqrt{a}} = 2\sqrt{2}$

$\Rightarrow a = ?$

A) 8 B) 16 C) 32 D) 64 E) 128

13. $\sqrt{x \cdot \sqrt[4]{x \cdot \sqrt[3]{x}}} = \sqrt{3^2 \cdot \sqrt[3]{3 \cdot \sqrt{3^2}}}$

$\Rightarrow x = ?$

A) 1 B) $\sqrt[3]{3}$ C) $\sqrt{3}$ D) 3 E) 9

14. $\sqrt{\frac{1}{2}\sqrt{4^{-1} \cdot \sqrt[3]{16}}} = 2^x$

$\Rightarrow x = ?$

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

15. $\sqrt{x \cdot \sqrt[5]{x^3}} = \sqrt[5]{\sqrt{16}}$

$\Rightarrow x = ?$

A) 1 B) $\sqrt[4]{2}$ C) $\sqrt{2}$ D) 2 E) 4

16. $\sqrt{2} \cdot \sqrt[3]{2} \cdot \sqrt[4]{2} = \sqrt{2 \cdot \sqrt[3]{2\sqrt{x}}}$

$\Rightarrow x = ?$

A) 4 B) 8 C) 16 D) 32 E) 64

KÖKLÜ İFADELER

TEST 10

1. $\sqrt{5\sqrt{5\sqrt{5\cdots}}} = ?$

A) $\sqrt{5}$ B) 5 C) $5\sqrt{5}$ D) 25 E) 125

2. $\dfrac{\sqrt[3]{64\cdot\sqrt[3]{64\cdot\sqrt[3]{64\cdot\ .....}}}}{\sqrt{64:\sqrt{64:\sqrt{64:\ .....}}}} = ?$

A) $\sqrt[3]{2}$ B) $\sqrt{2}$ C) 2 D) $2\sqrt{2}$ E) 4

3. $\dfrac{\sqrt{72+\sqrt{72+\sqrt{72+\ .....}}}}{\sqrt{12-\sqrt{12-\sqrt{12-\ .....}}}} = ?$

A) 8 B) 6 C) 4 D) 3 E) 2

4. $\sqrt{30+\sqrt{30+\sqrt{30+\ ...}}} + \sqrt{20-\sqrt{20-\sqrt{20-\ ...}}} = ?$

A) 50 B) 20 C) 11 D) 10 E) 5

5. $\sqrt{x+\sqrt{x+\sqrt{x+\cdots}}} = 5$

$\Rightarrow x = ?$

A) 5 B) 10 C) 15 D) 20 E) 30

6. $\left.\begin{array}{l} a = \sqrt{12+\sqrt{12+\sqrt{12+\ .....}}} \\ b = \sqrt{64:\sqrt{64:\sqrt{64:\ .....}}} \end{array}\right\} \Rightarrow a+b = ?$

A) 5 B) 8 C) 12 D) 20 E) 78

7. $\dfrac{\sqrt[4]{3\cdot\sqrt[4]{3\cdot\sqrt[4]{3\cdot\ .....}}}}{\sqrt{3:\sqrt{3:\sqrt{3:\ .....}}}} = ?$

A) 1 B) 3 C) 9 D) 81 E) 243

8. $\sqrt{x+\sqrt{x+\sqrt{x+\ .....}}} = 5$

$\Rightarrow \sqrt{x\cdot\sqrt{x\cdot\sqrt{x\cdot\ .....}}} = ?$

A) 4 B) 5 C) 10 D) 20 E) 25

9. $\sqrt{2\cdot\sqrt{3\cdot\sqrt{2\cdot\sqrt{3\cdot\ .....}}}} = ?$

A) $\sqrt[4]{12}$ B) $\sqrt[3]{12}$ C) $\sqrt[4]{18}$ D) $\sqrt[3]{18}$ E) $\sqrt{15}$

10. $\sqrt[3]{x+1+\sqrt[3]{x+1+\sqrt[3]{x+1+\sqrt[3]{...}}}} = 2$

$\Rightarrow x = ?$

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

11. $\sqrt[3]{x+\sqrt[3]{x+\sqrt[3]{x+\cdots}}} = 2$

$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 6 E) 8

12. $\sqrt[3]{x+\sqrt{3}\cdot\sqrt[3]{x+\sqrt{3}\cdot\sqrt[3]{x+\sqrt{3}\cdot...}}} = 3$

$\Rightarrow x = ?$

A) 15 B) 18 C) 21 D) 24 E) 27

13. $\sqrt{2+\sqrt{x-\sqrt{x-\sqrt{x-\cdots}}}} = 3$

$\Rightarrow x = ?$

A) 56 B) 48 C) 42 D) 28 E) 7

14. $\sqrt{14+\sqrt{6-\sqrt{6-\sqrt{6-...}}}} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

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

A) 2 B) 3 C) $2\sqrt{2}$ D) $2\sqrt{3}$ E) $3\sqrt{2}$

16. $\sqrt{44+\sqrt{20+\sqrt{30-\sqrt{30-\sqrt{30-.....}}}}} = ?$

A) 1 B) 2 C) 4 D) 5 E) 7

KÖKLÜ İFADELER

TEST 11

1. $A \in R$

$A = \sqrt{5-x} + \sqrt{x-5} + \sqrt{x+4}$

$\Rightarrow A = ?$

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

2. $A \in R$

$A = \dfrac{\sqrt{3-x} + 4x}{6 - \sqrt{x-3}} \Rightarrow A = ?$

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

3. $\sqrt{x-y+4} + \sqrt{y-3} = 0$

$\Rightarrow x \cdot y = ?$

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

4. $x \in R$

$\sqrt[3]{x-5} + \sqrt[3]{7-2x} = 0$

$\Rightarrow x = ?$

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

5. $\sqrt{(\sqrt{3}-\sqrt{2})^2} + \sqrt{(\sqrt{3}-5)^2} = ?$

A) $2\sqrt{3} - \sqrt{2} - 5$ B) $\sqrt{3} - 5$

C) $\sqrt{3} + \sqrt{2}$ D) $5 + \sqrt{2}$

E) $5 - \sqrt{2}$

6. $\left.\begin{matrix} a = 1 + \sqrt{3} \\ b = 1 - \sqrt{3} \end{matrix}\right\} \Rightarrow \sqrt{(b-a)^2} = ?$

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

7. $\left.\begin{matrix} x = \sqrt{3} + \sqrt{2} \\ y = \sqrt{3} - \sqrt{2} \end{matrix}\right\} \Rightarrow \dfrac{x}{y} + \dfrac{y}{x} = ?$

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

8. $\dfrac{\sqrt[3]{20} \cdot \sqrt{15}}{\sqrt[6]{375}} = ?$

A) $\sqrt[3]{80}$ B) $\sqrt[3]{60}$ C) $\sqrt[4]{60}$ D) $\sqrt[6]{80}$ E) $\sqrt[3]{40}$

9. $x = \frac{\sqrt{7}-2}{3-\sqrt{6}}$ $\quad y = \frac{3+\sqrt{6}}{\sqrt{7}+2}$

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

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

10. $\frac{\sqrt{7}-\sqrt{3}}{\sqrt{3}+1} = x \Rightarrow \frac{\sqrt{3}-1}{\sqrt{7}+\sqrt{3}} = ?$

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

11. $\frac{\sqrt{7}+1}{\sqrt{3}-1} = x \Rightarrow \frac{\sqrt{7}-1}{\sqrt{3}+1} = ?$

A) $3x$ B) $2x$ C) $\sqrt{x}$ D) $\frac{2}{x}$ E) $\frac{3}{x}$

12. $x = \frac{\sqrt{11}-2}{4-\sqrt{2}}$

$\Rightarrow \frac{4+\sqrt{2}}{\sqrt{11}+2} = ?$

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

13. $\left.\begin{array}{l} x = -4\sqrt{5} \\ y = -3\sqrt{3} \\ z = -6\sqrt{2} \end{array}\right\} \Rightarrow ? > ? > ?$

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

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

14. $a = \frac{1}{\sqrt[3]{4}}$ $\quad b = \frac{1}{\sqrt{5}}$ $\quad c = \frac{1}{\sqrt[6]{83}}$

$\Rightarrow ? > ? > ?$

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

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

15. $0 < a < 1$

$x = \sqrt{a}$ $\quad y = \sqrt[3]{a}$ $\quad z = \sqrt[6]{a}$

$\Rightarrow ? < ? < ?$

A) $x < z < y$ B) $z < x < y$ C) $y < x < z$

D) $x < y < z$ E) $z < y < x$

16. $\sqrt[3]{2} \cdot \sqrt{3x} = \sqrt[3]{4\sqrt{3}}$

$\Rightarrow x = ?$

A) $\sqrt[3]{\frac{3}{2}}$ B) $\sqrt[3]{\frac{4}{9}}$ C) $\sqrt[3]{\frac{9}{4}}$

D) $\frac{3}{2}$ E) $\frac{2}{3}$

KÖKLÜ İFADELER

TEST 12

1. $\sqrt{1+\frac{1}{2}} \cdot \sqrt{1+\frac{1}{3}} \cdot \sqrt{1+\frac{1}{4}} \cdot \ldots\ldots \cdot \sqrt{1+\frac{1}{7}} = ?$

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

2. $\sqrt[n]{5^{n+3}} - 2\sqrt[n]{5^3} = ?$

A) $5\sqrt[n]{5^3}$ B) $3\sqrt[n]{5^3}$ C) $\sqrt[n]{5^3}$ D) $\sqrt[3]{5^n}$ E) $5\sqrt[3]{5^n}$

3. $\frac{5\sqrt{2}-2\sqrt{5}}{\sqrt{5}-\sqrt{2}} = ?$

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

4. $x < 0 < y$

$\Rightarrow \frac{\sqrt{x^2}+\sqrt{y^2}}{\sqrt[3]{x^3}-\sqrt[3]{y^3}} = ?$

A) 1 B) y C) $-x$ D) $-y$ E) -1

5. $3 < x < 7$

$\Rightarrow \sqrt{x^2-5x+2+\sqrt{x^2-14x+49}} = ?$

A) $x-7$ B) $7-x$ C) $x-3$ D) $3-x$ E) $x-5$

6. $\sqrt[3]{\frac{16}{\sqrt{2}}} = 2^x \Rightarrow x = ?$

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{7}{6}$ E) $\frac{21}{2}$

7. $a \cdot \sqrt{\frac{2}{3}} = \sqrt{\frac{2}{3}} + \sqrt{\frac{3}{2}}$

$\Rightarrow a = ?$

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

8. $\frac{a\sqrt{b}-b\sqrt{a}}{a-b} : \frac{\sqrt{ab}}{\sqrt{a}+\sqrt{b}} = ?$

A) $\sqrt{a}$ B) $\sqrt{a}-\sqrt{b}$ C) 1 D) $\sqrt{a}+\sqrt{b}$ E) $\frac{1}{\sqrt{a}+\sqrt{b}}$

9. $\sqrt[3]{2+\sqrt{3}} \cdot \sqrt[6]{7-4\sqrt{3}} = ?$

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

10. $\sqrt{5^{2x-2} + \frac{24}{25^{1-x}}} = 125$

$\Rightarrow x = ?$

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

11. $a + \sqrt{a} = 16$

$\Rightarrow a + \frac{16}{\sqrt{a}} = ?$

A) 4 B) 12 C) 16 D) 17 E) 21

12. $m < 0$

$\sqrt{2m \cdot \sqrt[3]{-8m^2} \cdot \sqrt[6]{m^6}} = ?$

A) $4m^2$ B) $4m$ C) $2m$ D) $-2m$ E) $-m$

13. $x > 0$

$\frac{\sqrt[6]{x^{28} + x^{30}}}{\sqrt[6]{1 + \frac{1}{x^2}}} = ?$

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

14. $\sqrt{3} \cdot \sqrt[3]{3} \cdot \sqrt[6]{3} = \sqrt{\frac{1}{9}\sqrt[3]{27^x}}$

$\Rightarrow x = ?$

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

15. $\sqrt{2-\sqrt{3}} - \sqrt{2+\sqrt{3}} = ?$

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

16. $\sqrt[3]{x\sqrt{x}} = \sqrt{2\sqrt{2\sqrt{2\cdots}}}$

$\Rightarrow x = ?$

A) 2 B) $2\sqrt{2}$ C) 4 D) $4\sqrt{2}$ E) 8

1. $\sqrt{x+3} = a - \sqrt{x} = b + \sqrt{x}$

$\Rightarrow a \cdot b = ?$

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

2. $\sqrt[4]{17+12\sqrt{2}} = ?$

A) $1+\sqrt{2}$ B) $2+\sqrt{2}$ C) $1+2\sqrt{2}$ D) $3+\sqrt{2}$ E) $1+3\sqrt{2}$

3. $0 < m < 5$

$x = \sqrt{m+5-2\sqrt{5m}} + \dfrac{m}{\sqrt{m}}$

$\Rightarrow x^2 - 1 = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

4. $a^2 = 5 - 2\sqrt{6}$

$\Rightarrow (a+\sqrt{2}) \cdot (a-\sqrt{3}) = ?$

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

5. $x \neq 0$

$\sqrt{-x+2\sqrt{x}} + \sqrt{-y+\sqrt{2y-1}} = 0$

$\Rightarrow x + y = ?$

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

6. $(\sqrt{5} - x + x\sqrt{5}) \cdot (x + \sqrt{5} + x\sqrt{5}) = 50x - 95$

$\Rightarrow x = ?$

A) -10 B) -5 C) 5 D) 10 E) 15

7. $\sqrt{\sqrt{49+20\sqrt{6}}} = ?$

A) $5-\sqrt{6}$ B) $5-\sqrt{3}$ C) $2-\sqrt{3}$ D) $\sqrt{3}+\sqrt{2}$ E) $\sqrt{3}-\sqrt{2}$

8. $\dfrac{1}{\sqrt{2^x}} + \dfrac{1}{\sqrt{2^{x-2}}} - \dfrac{1}{\sqrt{2^{x-4}}} = -4$

$\Rightarrow x = ?$

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

9. $27^{\frac{a+1}{2}} = b$

$\Rightarrow 9^{a+1} = ?$

A) $\sqrt[3]{b^2}$ B) b C) $b\sqrt[3]{b}$ D) $b\sqrt[3]{b^2}$ E) b^2

10. $\dfrac{\sqrt{5+\sqrt{8}}-\sqrt{5-\sqrt{8}}}{\sqrt{5-\sqrt{17}}} = ?$

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

11. $\sqrt[4]{4020\cdot 4180 - 4182\cdot 4018} = ?$

A) 18 B) 15 C) $2\sqrt{6}$ D) $2\sqrt{5}$ E) $3\sqrt{2}$

12. $\sqrt[4]{28-16\sqrt{3}} = ?$

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

13. $\dfrac{\sqrt[3]{81:\sqrt[3]{81:\sqrt[3]{81:\ldots}}} + \sqrt[5]{16\cdot\sqrt[5]{16\cdot\sqrt[5]{16\cdot\ldots}}}}{\sqrt{4-\sqrt{6+\sqrt{6+\sqrt{6+\ldots}}}}} = ?$

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

14. $\dfrac{1}{\sqrt{2}+\sqrt{3}} + \dfrac{1}{\sqrt{3}+\sqrt{4}} + \dfrac{1}{\sqrt{4}+\sqrt{5}} = x$

$\dfrac{1}{\sqrt{5}+\sqrt{6}} + \dfrac{1}{\sqrt{6}+\sqrt{7}} + \dfrac{1}{\sqrt{7}+\sqrt{8}} = y$

$\Rightarrow x + y = ?$

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

15. $\sqrt{a+\sqrt{a}} - \sqrt{a-\sqrt{a}} = 3$

$\Rightarrow a = ?$

A) $\dfrac{20}{63}$ B) $\dfrac{54}{35}$ C) $\dfrac{60}{29}$ D) $\dfrac{72}{25}$ E) $\dfrac{81}{32}$

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

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

YANIT ANAHTARI | ANSWER KEY

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

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

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

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

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

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

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

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

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

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

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

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

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