TR-YÖS

Hazırlığı | Preparation

✓ **2000'den 2010'a Merkezi YÖS sınavları**
Central YÖS exams from 2000 to 2010

✓ **Matematik ve geometri sorularının çözümleri**
Solutions to math and geometry problems

✓ **Tüm sınavların anahtar cevapları**
Key answers of all quizzes

Ramin Bagherzadeh

Bizleri lütfuyla bir kez daha hidayete erdiren eşsiz Allah'a hamdolsun.

böylece küçük çabalarımızla başka bir grubu meyve verebiliriz

ÖNSÖZ

Merhabalar, yorulmayın sevgili TRYÖS sınav gönüllüleri.

Bu kitap siz sevgili gönüllüyü TRYÖS sınavına en iyi şekilde hazırlayabilmeniz için FESTTU koleksiyonundaki meslektaşlarımızın bir yılı aşkın emeği ile hazırlanmıştır. Bu nedenle bu kitabın kopyalanması ve kötüye kullanılması insanlık dışı ve etik dışı bir davranış olarak kabul edilmektedir.

Bir sonraki sayfada bu kitabın nasıl okunacağı gösterilmektedir, bu yüzden teste başlamadan önce kitabı okuduğunuzdan emin olun. **Teşekkürler: Ramin Bagherzadeh**

Introduction

Hello and don't be tired, dear TRYÖS exam volunteers.

This book has been prepared with the efforts of the colleagues of FESTTU collection for more than one year, so that you can prepare the dear volunteer as best as possible for the TRYÖS exam. For this reason, copying and misusing this book is considered an inhumane and unethical act.

The next page shows how to read this book, so be sure to read it before starting the test. **Thanks: Ramin Bagherzadeh**

Kitap nasıl kullanılır:

1. Her soruyu yanıtlama süresi 1,5 dakikadır. Bu nedenle, başlamadan önce zamanınızı soru sayısıyla koordine etmeye çalışın ve hatta daha erken bitirin.

2. Öncelikle aradığınız sınavı belirleyin ve soruları cevaplamadan önce kitabın sonundan birer boş cevap kağıdı alarak sınav ortamına alışın.

3. Soruları bir kalem kullanarak cevaplayın! Çünkü asıl sınavda soruları sınav oturumunda size verilecek kalemle cevaplamak zorunda kalacaksınız. Artık bu şartlara alışın!

4. Boş kağıt, hesap makinesi, cetvel vb. kullanmaktan kaçının! Hatta bazı üniversitelerde saat yasak ve artık zamanınızı duvar saati ile senkronize etmeye alışın.

5. Kitap sorularını cevaplama zamanını, ana sınav sorularını cevaplama zamanıyla koordine etmeye çalışın. Örneğin sınavın Türkiye saati ile 10'da olması gerekiyorsa, kitaptaki sınavları saat 10'da cevaplamalısınız ki beyniniz bu konuya alışsın.

6. Her testin sonunda soruların anahtar cevapları verilir. Önce, soruların temel cevaplarını içeren cevap kağıdınızı kontrol edin ve ardından açıklayıcı cevap kağıdına gidin.

7. Sorunlarınızı mutlaka yazın ve düzeltmeye çalışın.

* Bu arada asıl sınavdaki soruların kitaptaki sorularla aynı olacağına dair kendinize söz vermeyin, o yüzden daha zor ve yaratıcı sorular bekleyin.
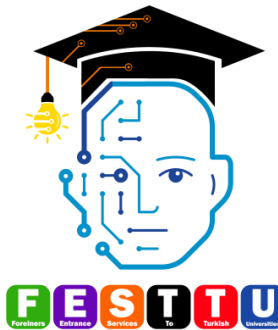
How to use the book:

1. Response time for each question is 1.5 minutes. Therefore, try to coordinate your time with the number of questions before you start and even finish earlier.

2. First of all, determine the exam you are looking for and before answering the questions, get used to the exam environment by taking a blank answer sheet from the end of the book.

3. Answer the questions using a pen! Because in the main exam, you will have to answer the questions with the pen that will be given to you in the exam session. Get used to these conditions now!

4. Blank paper, calculator, ruler, etc. Avoid using it! In fact, clocks are prohibited in some universities and now get used to synchronizing your time with the wall clock.

5. Try to coordinate the time to answer the book questions with the time to answer the main exam questions. For example, if the exam is supposed to be at 10 am Turkey time, you should answer the exams in the book at 10 am so that your brain gets used to the subject.

6. At the end of each test, key answers to the questions are given. First, check your answer sheet with the basic answers to the questions, and then go to the explanatory answer sheet.

7. Write down your problems and try to fix them.

* By the way, don't promise yourself that the questions in the main exam will be the same as in the book, so expect more difficult and creative questions.
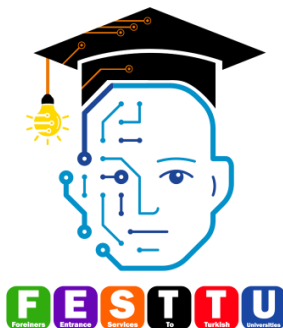
İçindekiler / Contents

TRYÖS sınavları / TRYÖS exams

TRYÖS çözümleri/TRYÖS solutions

1 – 5. sorulardaki işlemlerde her harf sıfırdan ve birbirinden farklı birer rakamı göstermektedir. Soru İşareti ile belirtilen harf ya da işlemin değerini bulunuz.

In questions 1 – 5 each letter stands for a different numeral zero excepted in the operations given. Find the value of letter incitated by the question mark.

1.

$$\begin{array}{r} K\,L\,M \\ M\,K\,L \\ +\ L\,M\,K \\ \hline 1\,5\,5\,4 \end{array} \qquad \dfrac{+\ \dfrac{K}{L}}{M} \qquad \dfrac{+\ \dfrac{L}{1}}{K} \quad \Rightarrow K = ?$$

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

2.

$$\dfrac{\begin{array}{r} K\,M \\ M\,K \end{array}}{L\,K} \qquad \dfrac{\times\ \dfrac{L}{2}}{M} \quad \Rightarrow L = ?$$

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

3.

$$\begin{array}{r} K\,L \\ \times\ \ 3K \\ \hline L\,M\,L \\ +\ M\,M\,L \\ \hline M\,7\,7\,L \end{array} \quad \Rightarrow K = ?$$

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

4.

$$\begin{array}{r} K\,L \\ -\ L\,M \\ \hline 1\,K \end{array} \qquad \dfrac{-\ \dfrac{K}{L}}{2} \quad \Rightarrow M = ?$$

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

5.

$$\begin{array}{r} K\,M \\ K\,M \\ +\ K\,M \\ \hline L\,L\,L \end{array} \quad \Rightarrow K = ?$$

A) 2   B) 3   C) 4   D) 6   E) 7

6.–10. sorularda, I. gruptaki kümelerin şekilleri birer rakam ile gösterilerek II. gruptaki sayılar elde edilmiştir. Soru işareti ile belirtilen kümenin şekillerinin hangi sayı ile gösterildeiğini bulunuz.

In questions 6–10, the numbers in group II stand for the sets of figures in group I, when each figure has been coded with a specific numeral. Find the number which corresponds to the set of the figures indicated by the question mark.

6.   **I.**   **II.**

△○●
■○□
□△■
●□■
○□●

△○● = ?

346   734   536
     647   457

A) 346   B) 457   C) 536   D) 647   E) 734

7.   **I.**   **II.**

△◇✳
○△✳
◇○◇
□◇○
□✳□

○△✳ = ?

987   292   529
     575   827

A) 292   B) 529   C) 575   D) 827   E) 987

8.   **I.**   **II.**

△□●▲
●△○▲
■○□●
○□△●
□○■●

■○□● = ?

5346   2415   3256
     4235   1425

A) 1425   B) 2415   C) 3256   D) 4235   E) 5346

9.

I.
□ ◇ ✱ ●
✱ △ ● ○
◇ △ ○ ⬛
● □ ○ ◇
△ ✱ ◇ ○
◇ △ ○ □ = ?

II.
  6437   1345   4657

      3671   5173

A) 1345   B) 3671   C) 4657   D) 5173 E) 6437

10.

I.
● ○ ▲ △
○ △ ▲ ■
□ ■ ○ ●
■ ▲ △ □
● □ △ ▲
■ □ △ ● = ?

II.
  4371   6173   2716

      3624   4217

A) 1726   B) 2614   C) 3276   D) 6374 E) 7342

11.

5	4	3	2	1

9	7	5	3

16	a	8

28	20

b

a = ?   b = ?

Yukarıdaki şekilde a ve b nin yerine hangi sayılar gelmelidir?

Which numbers do a and b stand for in the figure above?

	a	b
A)	12	24
B)	12	28
C)	12	48
D)	24	28
E)	24	48

12.
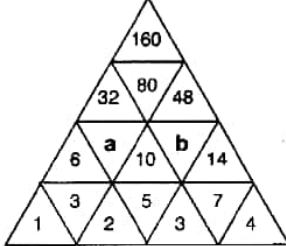
Triangle figure:
160
32   80   48
6   a   10   b   14
3   5   7
1   2   3   4

a = ?   b = ?

Yukarıdaki şekilde a ve b nin yerine hangi sayılar gelmelidir?

Which numbers do a and b stand for in the figure above?

	a	b
A)	9	14
B)	12	24
C)	12	28
D)	16	14
E)	16	24

13.

22	17	31	35	24
29	28	38	46	31
27	22	36	40	29
22	21			24
28	23	?		

Yukarıdaki şekilde soru işaretinin yerine aşağıdakilerden hangisi gelmelidir?

What does the question mark stand for in the figure above?

A)
31	39	
37	41	30

B)
31	35	
36	41	26

C)
31	35	
36	37	26

D)
35	35	
36	45	26

E)
35	39	
37	45	30

21.

⊗	△	○	□	⬡	●
△	⬡	●	△	○	□
○	●	△	○	□	⬡
□	△	○	□	⬡	●
⬡	○	□	⬡	●	△
●	□	⬡	●	△	○

$[(\triangle \otimes \bigcirc) \otimes ?] \otimes (\square \otimes \square) = \square$

Yukarıdaki tabloda ⊗ işleminin kuralları verilmiştir. Buna göre, soru işaretinin yerine hangi şekil gelmelidir?

According to the rules of ⊗ operation established in the table above, which of the following does the question mark stand for?

A) $(\triangle \otimes \bigcirc)$ B) $(\triangle \otimes \square)$ C) $(\bullet \otimes \bigcirc)$

D) $(\bigcirc \otimes \triangle)$ E) $(\square \otimes \square)$

22.

+	✳	+	■
✳	■	✳	□
●	□	+	○
○	●	●	+

I.
K
✳

K	L

; K = +, L = O

II.
M	□
N	M

M = ?, N = ?

I ve II, yukarıdaki tablonun farklı birer parçasıdır. Buna göre, II deki M ve N nin yerine aşağıdakilerden hangisi gelmelidir?

I and II are two different parts of the table above. Which of the following do M and N stand for in II?

	M	N
A)	●	○
B)	+	●
C)	●	□
D)	✳	+
E)	✳	□

23.

✳	○●▲	△□■	□△●	○▲■
○	●▲	△□■	K	▲■
△	○●▲	ℓ	□●	○▲■
□	○●▲	M	△●	○▲■

K = ?   L = ?   M = ?

Yukarıdaki tablo ✳ işlemine göre düzenlenmiştir. Buna göre, K, L ve M nin yerine hangi şekiller gelmelidir?

The table above is organized according to the ✳ operation. Which of the following do K, L and M stand for?

	K	L	M
A)	□△●	△□■	△■
B)	△●	△□	△□
C)	□△●	□■	△■
D)	□△●	□■	△□■
E)	△●	△□■	△□

24.

△	✪ ☀	⌘ ♥	⊙
☀ ♥	♥ ✪	☀ ⌘	☀♥⊙
♥	♥⊙☀	⌘	♥ ⊙
☀⌘	⌘ ✪	☀ ♥	?

Yukarıdaki tablo △ işlemine göre düzenlenmiştir. Buna göre, soru işaretinin yerine hangi şekiller gelmelidir?

The table above is organized according to the △ operation. Which of the following does the question mark stand for?

A) ☀ ♥   B) ⌘ ✪   C) ⊙ ☀

D) ⌘ ♥ ✪   E) ☀ ⌘ ⊙

1.– 4. sorularda, I. gruptaki kümelerin şekilleri birer ra-
kamla gösterilerek II. gruptaki sayılar elde edilmiştir.
Soru işaretiyle belirtilen kümenin hangi sayıyla göste-
rildiğini bulunuz.

In questions 1 – 4, the numbers in group II stand for the
sets of figures in group I, when each figure has been
coded with a specific numeral. Find the number which
corresponds to the set of the figures indicated by the
question mark.

1.

I.	II.
△ ◎ □	
+ △ ◎	
> + △	125 253 341
◎ □ >	415 534
□ > △	

⇒ ◎ □ > = ?

A) 125   B) 253   C) 341

D) 415   E) 534

2.

I.	II.
● ✳ △	
◇ ○ ✳	
○ ◆ ◇	316 152 842
✳ ▲ ◇	281 436
◆ ● △	

⇒ ● ✳ △ = ?

A) 316   B) 152   C) 842

D) 281   E) 436

3.

I.	II.
□ △ ●	
■ ◇ ▲	
○ ✳ ◇	672 978 754
✳ ▲ □	685 423
■ ✳ △	

⇒ □ △ ● = ?

A) 672   B) 978   C) 754

D) 685   E) 423

4.

I.	II.
● ○ ▲ △	
○ △ ▲ □	
■ ▲ △ □	5762 2543 3267
□ ■ ○ ●	4672 3476
● □ △ ▲	

⇒ ● ○ ▲ △ = ?

A) 5762   B) 2543   C) 3267

D) 4672   E) 3476

5.   I. $\sqrt{a} \oplus \sqrt[3]{b} = 2a + 3b$

II. $3 \oplus (-2) = ?$

I. eşitlikte ⊕ işaretinin görevi belirlenmiştir. Buna göre, II.
eşitlikteki soru işaretinin yerine aşağıdakilerden hangisi
gelmelidir?

In the first equation, the function of ⊕ is established.
According to this function, which of the following does the
question mark stand for in equation II?

A) –6   B) –4   C) 0   D) 4   E) 6

6.   I. $\dfrac{1}{1+\dfrac{1}{a \otimes b}} = a \cdot b$

II. $(-1) \otimes 3 = ?$

I. eşitlikte ⊗ işaretinin görevi belirlenmiştir. Buna göre, II.
eşitlikteki soru işaretinin yerine aşağıdakilerden hangisi
gelmelidir?

In the first equation, the function of ⊗ is established.
According to this function, which of the following does the
question mark stand for in equation II?

A) $-\dfrac{2}{3}$ B) $-\dfrac{4}{3}$ C) $-\dfrac{3}{4}$ D) -3 E) -6
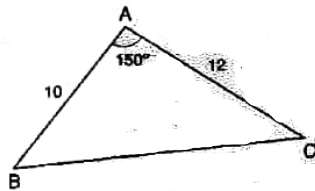
62. $\dfrac{1+\tan 50°}{1+\tan 40°} = ?$

A) $1 + \tan20°$ B) $1 + \cot20°$

C) $1 + \tan40°$ D) $\tan40°$

         E) $\cot40°$

63. $m(\widehat{BAC}) = 150°$

$|AB| = 10$ cm

$|AC| = 12$ cm

$A(\overset{\Delta}{ABC}) = ?$ cm²
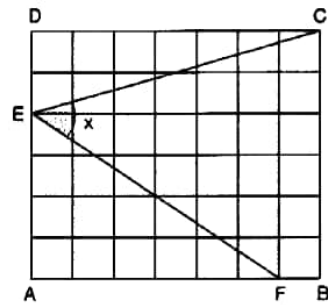
A) 30   B) 36   C) 42   D) 48   E) 56

64. $\dfrac{\cos\dfrac{\pi}{8}\cdot\sin\dfrac{\pi}{8}}{\left(2\cos^2\dfrac{\pi}{8}\right)-1} = ?$

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

     D) $\dfrac{\sqrt{3}}{2}$ E) $\sqrt{3}$

65.

$\tan x = ?$

A) $\dfrac{20}{17}$ B) $\dfrac{20}{21}$ C) $\dfrac{17}{21}$ D) $\dfrac{21}{40}$ E) 1

66. $f(x) = \begin{cases} x+8 & x \le 3 \\ 2 + ax^2 & x > 3 \end{cases}$

$\lim\limits_{x \to 3^-} f(x) = \lim\limits_{x \to 3^+} f(x)$

$a = ?$

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

67. $\lim\limits_{x \to 5} \dfrac{\sqrt{x+11}-4}{\sqrt{x-1}-2} = ?$

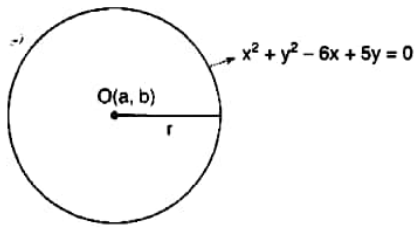A) $\dfrac{9}{5}$ B) $\dfrac{3}{5}$ C) $\dfrac{1}{5}$ D) $\dfrac{1}{2}$ E) $\dfrac{5}{2}$

68. $f(x) = \tan\dfrac{x}{2}$

$\lim\limits_{x \to \frac{\pi}{2}} \dfrac{f(x)-f\left(\dfrac{\pi}{2}\right)}{x-\dfrac{\pi}{2}} = ?$

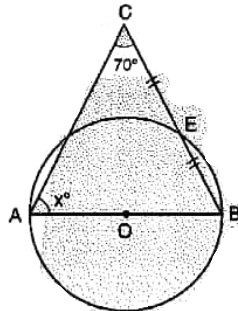A) 1   B) 2   C) $\sqrt{2}$ D) $2\sqrt{2}$ E) $\sqrt{3}$

132

75.

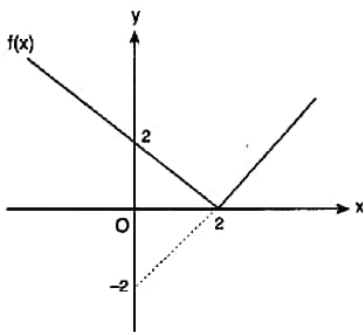
$x^2 + y^2 - 6x + 5y = 0$

O(a, b)

r

r = ? cm

A) $\dfrac{11}{2}$ B) $\dfrac{15}{2}$ C) $\dfrac{9}{4}$ D) $\dfrac{\sqrt{15}}{2}$ E) $\dfrac{\sqrt{61}}{2}$

76. |BE| = |EC|

$m(\widehat{ACB}) = 70°$

$m(\widehat{BAC}) = x°$

x = ?

A) 20 B) 25 C) 30 D) 40 E) 45

77.

f(x) = ?

A) |x| + 2   B) |2 + x| C) |x − 2|

D) |2x| − 2   E) |2x − 4|

78. $\begin{bmatrix} x^2 & 1 \\ x^2-9 & 0 \end{bmatrix} = \begin{bmatrix} 6x-9 & 1 \\ 0 & \cos\dfrac{\pi x}{2} \end{bmatrix}$

x = ?

A) −1 B) −2 C) 1 D) 2 E) 3

79. $A = \begin{bmatrix} 3 & 2 \\ 9 & 5 \end{bmatrix}$

$\det\left(A^{-1}\right) = ?$

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

80. $\overline{A} + \overline{B} = (-2, 1)$

$|\overline{A}|^2 + |\overline{B}|^2 = 15$

$< \overline{A}, \overline{B} > = ?$

A) −10 B) −6 C) −5 D) −4 E) −3

40. $\dfrac{\sqrt{36}}{\sqrt[4]{81}} = ?$

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

45. $x^3 + 2 = 3x^2$

$\Rightarrow 3x + \dfrac{6}{x^2} = ?$

A) 6   B) 9   C) 12   D) 13   E) 15

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

A) $-\dfrac{1}{30}$ B) $-\dfrac{5}{6}$ C) $-\dfrac{1}{5}$ D) -6 E) -5

46. $\dfrac{a}{b} + \left(\dfrac{a}{b}\right)^{-1} = \dfrac{7}{4}$

$\Rightarrow \left(\dfrac{a}{b}\right)^{2} + \left(\dfrac{a}{b}\right)^{-2} = ?$

A) $\dfrac{17}{16}$ B) $\dfrac{27}{16}$ C) $\dfrac{57}{16}$ D) 16   E) 32

42. $4 + 8 + 12 + \ldots + 44 + 48 = ?$

A) 312   B) 316   C) 320   D) 324   E) 328

47. $0 < x$

$\dfrac{1}{x} + \dfrac{1}{2x+1} = 1$

$\Rightarrow x = ?$

A) $1 + \sqrt{3}$ B) $2 + \sqrt{3}$ C) $\dfrac{1-\sqrt{3}}{4}$

D) $\dfrac{1+\sqrt{3}}{4}$ E) $\dfrac{1+\sqrt{3}}{2}$

43.

$$\begin{array}{r} K\,L \\ \underline{\times \quad L} \\ 6\,2\,4 \end{array} \Rightarrow K = ?$$

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

48. $\log(x - a) = \log x - \log a$
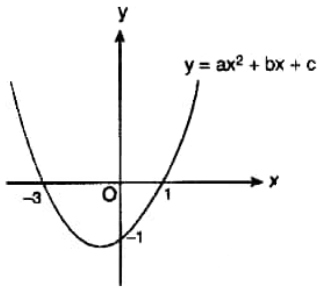
$\Rightarrow x = ?$

A) $\dfrac{a}{a-1}$ B) $\dfrac{a}{1-a}$ C) $\dfrac{a}{a+1}$

D) $\dfrac{a^2}{a-1}$ E) $\dfrac{a^2}{1+a}$

44. $3^a \cdot 4^{-b} = 4$

$3^{-b} \cdot 4^a = 36$

$\Rightarrow a - b = ?$

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

9. f(x) = x

g(x) = 2x

h(x) = 3x

(fogoh) (x) = k · h(x)

$\Rightarrow$ k = ?
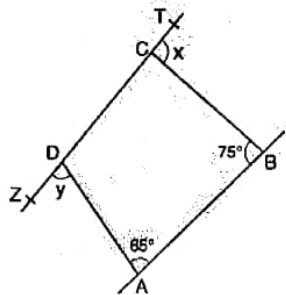
A) 1 B) 2 C) 3 D) 5 E) 6
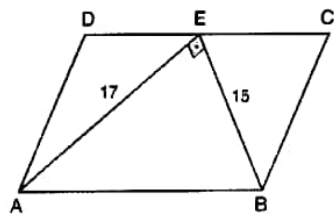
0.

$y = ax^2 + bx + c$

$\Rightarrow$ 3a + 6b + 2c = ?

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

·1. $m(\widehat{TCB}) = x°$

$m(\widehat{ADZ}) = y°$

$m(\widehat{ABC}) = 75°$

$m(\widehat{BAD}) = 65°$

$\Rightarrow$ x + y = ?

A) 220 B) 200 C) 185 D) 150 E) 140

·2. [AE] $\perp$ [BE]

[AB] // [DC]

[AD] // [BC]

IAEI = 17 cm

IEBI = 15 cm $\Rightarrow$

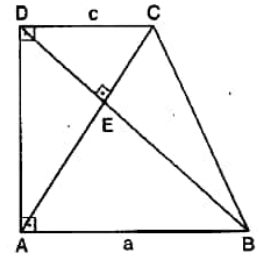A(ABCD) = ? cm²

A) 205 B) 215 C) 255 D) 275 E) 315

53. $m(\widehat{DAB}) = m(\widehat{ADC}) = m(\widehat{DEC}) = 90°$

IDCI = c

IABI = a

$\Rightarrow$ IDAI = ?

A) $\sqrt{ac}$ B) $\sqrt{a+c}$ C) a · c

D) $a^2 \cdot c^2$ E) $a^2 + c^2$

54. $\lim\limits_{x \to a} \dfrac{x^2 - a^2}{x^2 - x - ax + a} = ?$

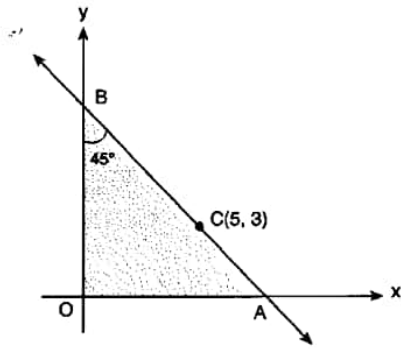A) $2a^2$ B) 2a C) a D) $\dfrac{3}{2}a$ E) $\dfrac{2a}{a-1}$

55. f : $\mathbb{R} \to \mathbb{R}$

f (x) = $x^2 - 2x + 2$

$\Rightarrow \lim\limits_{x \to 1} \dfrac{f(x) - f(1)}{x - 1} = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

56. f (x) = $\dfrac{x^2 - 5x + 6}{x^2 + 5x + 6}$

$\Rightarrow \dfrac{df}{dx}(0) = f'(0) = ?$

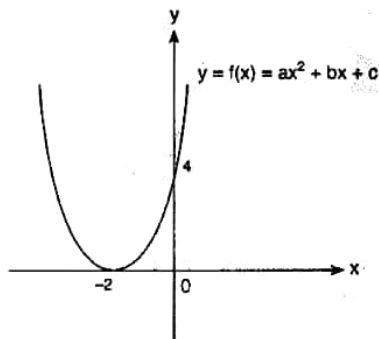A) $-\dfrac{5}{3}$ B) $-\dfrac{2}{3}$ C) $-\dfrac{1}{3}$ D) –2 E) –1

60.

$\Rightarrow A(OAB) = ?$

A) 18   B) 27   C) 32   D) 35   E) 36

61.

$y = f(x) = ax^2 + bx + c$

$\Rightarrow f(-3) = ?$

A) −2   B) −1   C) 0   D) 1   E) 2
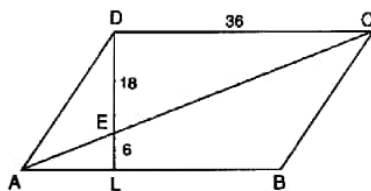
62. AB // DC

BC // AD

IDCI = 36 cm

IDEI = 18 cm

IELI = 6 cm

$\Rightarrow$ ILBI = ? cm

A) 24   B) 22   C) 20   D) 16   E) 12

63. [AB] ⊥ [BC]

[EC] ⊥ [DC]
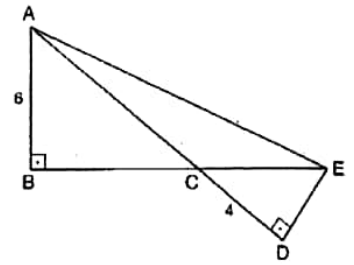
C ∈ [AD]

IABI = 6 cm
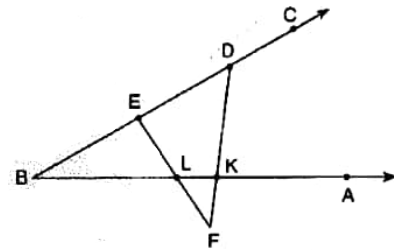
ICDI = 4 cm

$A(C\overset{\Delta}{D}E) = 6$ cm²

$\Rightarrow A(A\overset{\Delta}{C}E) = ?$ cm²

A) 10   B) 12   C) 15   D) 18   E) 20

64.

$\Rightarrow \overset{\Delta}{EFD} \cap \widehat{ABC} = ?$

A) {E, D, L, K}   B) {[ED], L, K}   C) {E, D, [LK]}

D) {[ED], [LK]}   E) {[ED], [KL], F}

Yanıt Anahtarı (Answer Sheet)						2002
1.A	2.C	3.E	4.D	5.D	6.A	7.C
8.D	9.B	10.C	11.C	12.E	13.A	14.D
15.A	16.E	17.B	18.B	19.D	20.A	21.E
22.C	23.C	24.B	25.A	26.C	27.B	28.E
29.B	30.A	31.A	32.D	33.E	34.B	35.D
36.B	37.A	38.A	39.D	40.B	41.D	42.E
43.A	44.D	45.E	46.C	47.E	48.B	49.C
50.E	51.A	52.D	53.D	54.D	55.C	56.B
57.E	58.B	59.C	60.C	61.D	62.A	63.C
64.A						

42

1.
  I. $2 \odot 3 = 8$
  II. $5 \odot 4 = 13$
  III. $9 \odot 8 = 25$
  IV. $4 \odot 7 = ?$

Yukarıdaki dört eşitlikte $\odot$ işaretinin görevi aynıdır. Buna göre, dördüncü eşitlikteki soru işaretinin yerine aşağıdakilerden hangisi gelmelidir?

In the equations above, the function of $\odot$ remains unchanged. What does the question mark stand for in the fourth equation?

A) 12   B) 16   C) 18   D) 21   E) 23

2.
  I. $4 \otimes 5 = 16$
  II. $7 \otimes 10 = 63$
  III. $6 \otimes 2 = 6$
  IV. $9 \otimes 7 = ?$

Yukarıdaki dört eşitlikte $\otimes$ işaretinin görevi aynıdır. Buna göre, dördüncü eşitlikteki soru işaretinin yerine aşağıdakilerden hangisi gelmelidir?

In the equations above, the function of $\otimes$ remains unchanged. What does the question mark stand for in the fourth equation?

A) 62   B) 54   C) 48   D) 42   E) 32

3.
  I. $4 \oplus 6 = 20$
  II. $3 \oplus 5 = 16$
  III. $3 \oplus 9 = 24$
  IV. $6 \oplus 8 = ?$

Yukarıdaki dört eşitlikte $\oplus$ işaretinin görevi aynıdır. Buna göre, dördüncü eşitlikteki soru işaretinin yerine aşağıdakilerden hangisi gelmelidir?

In the equations above, the function of $\oplus$ remains unchanged. What does the question mark stand for in the fourth equation?

A) 16   B) 18   C) 24   D) 28   E) 32

4.
  I. $2 * 3 = \frac{1}{6}$
  II. $1 * 4 = \frac{3}{4}$
  III. $\frac{1}{6} * \frac{1}{3} = 3$
  IV. $\frac{1}{a} * \frac{1}{b} = ?$

Yukarıdaki dört eşitlikte $*$ işaretinin görevi aynıdır. Buna göre, dördüncü eşitlikteki soru işaretinin yerine aşağıdakilerden hangisi gelmelidir?

In the equations above, the function of $*$ remains unchanged. What does the question mark stand for in the fourth equation?

A) $a - b$ B) $a + b$ C) $\dfrac{ab}{a+b}$

D) $\dfrac{ab}{a-b}$ E) $\dfrac{2ab}{a+b}$

5.

x	a	b	c
a		16	3·b
b		64	

$$\Rightarrow c = ?$$

Yukarıdaki çarpma tablosunda a, b ve c harfleri pozitif birer sayının yerine kullanılmıştır. Buna göre, c kaçtır?

In the multiplication table above, the letters a, b and c each stand for a positive number. What is the value of c?

A) 2   B) 4   C) 6   D) 8   E) 12

62. $x \neq -3$

$\log_{10}(4x+12) + \log_{10}\dfrac{250}{x+3} = ?$

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

63. $f(x) = x - 3$

$fog(x) = x^2 - 6x + 6$

$g(x) = ?$

A) $x^2 - 3$ B) $x^2 - 6$ C) $(x-1)^2$

D) $(x-2)^2$ E) $(x-3)^2$

64. $\displaystyle \lim_{x \to +\infty} \frac{2x^3 + 5x^2 - 7x}{3x^2 + 5} = ?$

A) $-\infty$ B) $+\infty$ C) 0   D) 1   E) $\dfrac{2}{3}$

65. $\displaystyle \lim_{x \to 3} \frac{\sin(7x-21)}{2x-6} = ?$

A) $\dfrac{7}{2}$ B) $\dfrac{5}{2}$ C) $\dfrac{3}{2}$ D) 0   E) 1

66. $\displaystyle \lim_{x \to 3^+} \frac{|x-3|}{x-3} = ?$

A) -1 B) 0   C) 1   D) 3   E) $+\infty$

67. $f(x) = x^3 + 2x^2 + \ln x - 1$

$\dfrac{d^2 f}{dx^2}\bigg|_{x=1} = f''(1) = ?$

A) 1   B) 4   C) 6   D) 8   E) 9

68. $f(x) = \sin(\ln x)$

$\dfrac{df}{dx}\bigg|_{x=e^\pi} = f'(e^\pi) = ?$

A) $\dfrac{-1}{e^\pi}$ B) $\dfrac{-2}{e^\pi}$ C) $\dfrac{1}{e^\pi}$
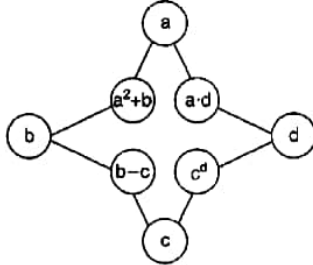
D) $\dfrac{e^\pi}{2}$ E) $2e^x$

69. $x = \ln t$

$y = t^3 - 3t^2 - 3t$

$\dfrac{dy}{dx}\bigg|_{x=0} = ?$

A) -6 B) -3 C) 1   D) 3   E) 9

**Yukarıdaki şekil a, b, c ve d harfleriyle gösterilen dört po-
zitif sayı ve bu sayıları içeren bazı işlemlere göre düzen-
lenmiştir. Harflerin gösterdiği sayılar her soruda farklı ola-
bilir.**

In the figure above, a, b, c and d stand for four positive
integers and various operations concerning these integers are
shown. The numerical value of the letters may change from
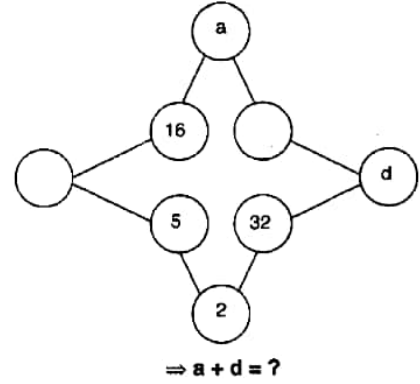question to question.

17.
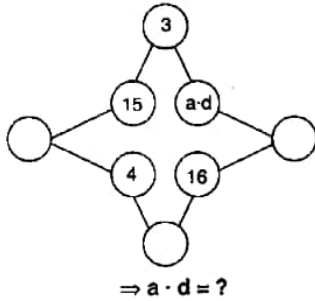
$$\Rightarrow a \cdot d = ?$$

Yukarıda verilen şekle göre a·d işleminin sonucu kaçtır?
According to the figure above, what is a·d?

A) 6   B) 9   C) 12   D) 15   E) 18

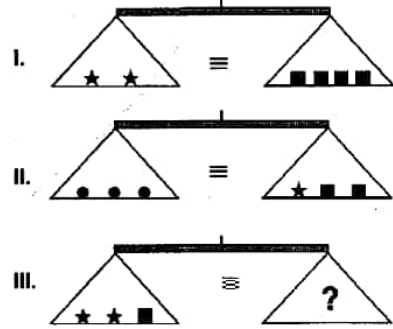**18.**

$$\Rightarrow a + d = ?$$

Yukarıda verilen şekle göre a + d işleminin sonucu kaçtır?
According to the figure above, what is a + d?

A) 7   B) 8   C) 9   D) 10   E) 11

19.

**Yukarıdaki terazilerin üçü de dengede olduğuna göre, III.
terazide soru işareti aşağıdakilerden hangisini göstermek-
tedir?**

All three scales above are in balance. Which of the following
does the question mark stand for in the third scale?

A) ■ ● ★   B) ■ ■ ★   C) ● ● ● ■

D) ● ● ★ ■   E) ■ ■ ●

1. $\dfrac{a}{2} = \dfrac{b}{3} = \dfrac{c}{5} \Rightarrow \begin{cases} a = 2k \\ b = 3k \\ c = 5k \end{cases}$

$a + b + c = 80$

$2k + 3k + 5k = 80$

$10k = 80 \Rightarrow k = 8$

$a = 2 \cdot 8 = 16, \quad b = 3 \cdot 8 = 24, \quad c = 5 \cdot 8 = 40$

$b + a - c = 24 + 16 - 40 = 0$

Yanıt / Answer C

2. $\dfrac{\sqrt{1 + \dfrac{17}{64}}}{\sqrt{1 - \dfrac{27}{36}}} = \dfrac{\sqrt{\dfrac{64 + 17}{64}}}{\sqrt{\dfrac{36 - 27}{36}}}$

$= \dfrac{\sqrt{\dfrac{81}{64}}}{\sqrt{\dfrac{9}{36}}} = \dfrac{\dfrac{9}{8}}{\dfrac{3}{6}} = \dfrac{9}{8} \cdot \dfrac{6}{3} = \dfrac{9}{4}$

Yanıt / Answer C

3. $0,003 = \dfrac{1}{100} k$

$\dfrac{3}{1000} = \dfrac{1}{100} k$

$k = \dfrac{3}{10}$

Yanıt / Answer A

4. $99^2 - 4 = (99 + 2) \cdot (99 - 2)$

$= 101 \cdot 97$

$= 9797$

Yanıt / Answer D

5. $(3x - 1)^2 = 9x^2 + 13$

$9x^2 - 6x + 1 = 9x^2 + 13$

$-6x + 1 = 13$

$-6x = 12$

$x = -2$

Yanıt / Answer D

6.
$\begin{array}{l} a + b = 2 \\ -1/ \quad a - c = -2 \\ \hline b + c = 4 \end{array}$

$\left. \begin{array}{l} b + c = 4 \\ b \cdot c = 4 \end{array} \right\} \Rightarrow \begin{cases} b = 2 \\ c = 2 \end{cases}$

$2 + a = 2 \Rightarrow a = 0$

Yanıt / Answer B

7. $\sqrt[4]{a} = 2 \Rightarrow a = 2^4 = 16$

$\sqrt[3]{b} = 3 \Rightarrow b = 3^3 = 27$

$a + b = 16 + 27 = 43$

Yanıt / Answer E

8.

$$\frac{\sqrt[3]{8^{3x+1}}}{\sqrt{2^{6x+8y}}} = 32$$

$$2^{\frac{9x+3}{3}} \cdot 2^{\frac{-6x-8y}{2}} = 2^5 \Rightarrow 2^{\frac{9x+3}{3}-\frac{-6x-8y}{2}} = 2^5$$

$$2^{\frac{18x+6-18x-24y}{6}} = 2^5 \Rightarrow 2^{\frac{6-24y}{6}} = 2^5$$

$$\frac{6-24y}{6} = 5 \Rightarrow 6-24y = 30$$

$$-24y = 24$$

$$y = -1$$

Yanıt / Answer A

9. $\log 2 = a, \quad \log 3 = b$

$\log 216 = \log 6^3 = 3\log 2 \cdot 3$

$= 3(\log 2 + \log 3)$

$= 3(a + b) = 3a + 3b$

Yanıt / Answer A

10. $f(x) = 4x - 5$

$g(x) = 3x + 2$

$g(0) = 3 \cdot 0 + 2 = 2$

$f(g(0)) = f(2) = 4 \cdot 2 - 5$

$\qquad\qquad = 8 - 5 = 3$

Yanıt / Answer D

11. $\underbrace{1+2+3+4}+5+6+\ldots+n = \dfrac{n(n+1)}{2}$

$(10) + \underbrace{5+6+\ldots+n}_{290} = \dfrac{n(n+1)}{2}$

$300 = \dfrac{n(n+1)}{2}$

$600 = n(n+1)$

$24 \cdot 25 = n(n+1)$

$n = 24$

Yanıt / Answer E

12.   **a.** $x + x + 1 = 9$

$\qquad\qquad 2x = 8$

$\qquad\qquad x_1 = 4$

   b. $-x - x - 1 = 9$

$\qquad\qquad -2x = 10$
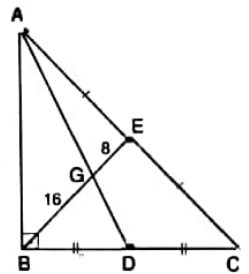
$\qquad\qquad x_2 = -5$

$\sum x = x_1 + x_2 = 4 - 5 = -1$

Yanıt / Answer A

13.

$|BG| = 2 \cdot 8 = 16$

$|BE| = |EC| = 24$

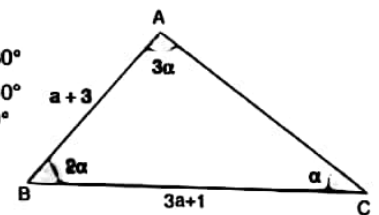$|AC| = 2|EC| = 2 \cdot 24 = 48 \text{ cm}$

Yanıt / Answer D

14. $\overset{\Delta}{ABC}$

$3\alpha + 2\alpha + \alpha = 180°$

$\qquad\qquad 6\alpha = 180°$

$\qquad\qquad \alpha = 30°$

$m\widehat{A} = 3 \cdot 30° = 90°$

$m\widehat{B} = 2 \cdot 30° = 60°$

$m\widehat{C} = 30°$

$m\widehat{A} = 90° \Rightarrow a + 3 = \dfrac{3a+1}{2}$

$\qquad\qquad 2a + 6 = 3a + 1$

$\qquad\qquad a = 5 \text{ cm}$

$|AB| = a + 3 = 5 + 3 = 8$

Yanıt

/

Answer E

21.
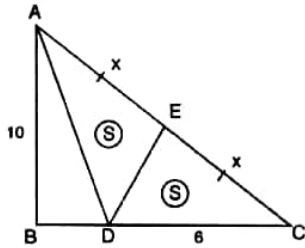
$$A(\overset{\Delta}{ADE}) = A(\overset{\Delta}{EDC}) = S$$

$$2S = \frac{10 \cdot 6}{2}$$

$$2S = 30$$

$$S = 15 \text{ cm}^2$$

Yanıt / Answer A

22.
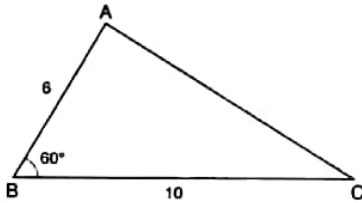
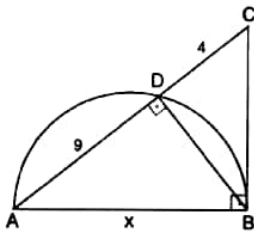$$A(\overset{\Delta}{ABC}) = \frac{|BC| \cdot |AB|}{2} \cdot \sin \widehat{B}$$

$$= \frac{10 \cdot 6}{2} \cdot \sin 60°$$

$$= 30 \cdot \frac{\sqrt{3}}{2} = 15\sqrt{3} \text{ cm}^2$$

Yanıt / Answer C

23.

$$\overset{\Delta}{ADB} \sim \overset{\Delta}{ABC}$$

$$\frac{|ADI|}{|ABI|} = \frac{|ABI|}{|ACI|}$$

$$\frac{9}{x} = \frac{x}{13}$$

$$x^2 = 9 \cdot 13 \Rightarrow x = 3\sqrt{13} \text{ cm}$$

Yanıt / Answer B

24.

$$\sqrt{\frac{\frac{5}{2} + \sin 30°}{5 + \cot 135°}} = \sqrt{\frac{\frac{5}{2} + \frac{1}{2}}{5 - 1}}$$

$$= \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$$

Yanıt / Answer D

25.

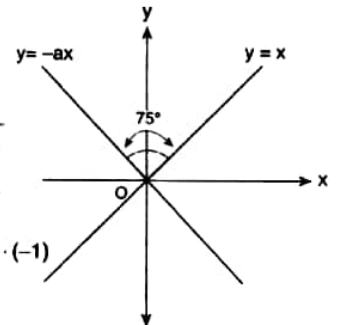$$m_1 = 1$$

$$m_2 = -a$$

$$\tan \alpha = \frac{m_2 - m_1}{1 + m_1 \cdot m_2}$$

$$\tan 75° = \frac{-1-a}{1-a}$$

$$\tan(45° + 30°) = \frac{1+a}{1-a} \cdot (-1)$$

$$\frac{\tan 45° + \tan 30°}{1 - \tan 45° \cdot \tan 30°} = \frac{1+a}{1-a}(-1)$$

$$\frac{1 + \frac{1}{\sqrt{3}}}{1 - \frac{1}{\sqrt{3}}} = \frac{1+a}{1-a}(-1)$$

$$\sqrt{3} - \sqrt{3}a + 1 - a = 1 + a - \sqrt{3} - \sqrt{3}a$$

$$2a = 2\sqrt{3}$$

$$a = \sqrt{3}$$

Yanıt / Answer A

1. $2^{-4} \cdot 2^5 + 2^{-4} \cdot 2^6 = 2 + 2^2$

$= 2 + 4 = 6$

Yanıt / Answer C

2. $\dfrac{\sqrt{5}+2}{\sqrt{5}-2} + \dfrac{\sqrt{5}-2}{\sqrt{5}+2}$

$= \dfrac{(\sqrt{5}+2)^2 + (\sqrt{5}-2)^2}{(\sqrt{5}-2)(\sqrt{5}+2)}$

$= \dfrac{9+4\sqrt{5}+9-4\sqrt{5}}{5-4} = 18$

Yanıt / Answer D

3. $\dfrac{1}{1-\dfrac{1}{\dfrac{x+1}{x}}} = \dfrac{1}{1-\dfrac{x}{x+1}} = \dfrac{1}{\dfrac{1}{x+1}}$

$= x+1 = \dfrac{1}{2}$

$x = -\dfrac{1}{2}$

Yanıt / Answer B

4. $\sqrt{3^x + 72} = 3^x$

$3^x + 72 = 3^{2x}$

$\Rightarrow 3^{2x} - 3^x - 72 = 0$

$3^x = u \Rightarrow u^2 - u - 72 = 0$

$(u-9)(u+8) = 0 \qquad u+8 = 0$

$u - 9 = 0 \qquad\qquad u = -8$

$u = 9 \qquad\qquad 3^x \neq -8$

$3^x = 9 \Rightarrow x = 2$

Yanıt / Answer B

5. $\dfrac{a \cdot b + 1}{b} = 3 \Rightarrow a \cdot b + 1 = 3b$

$\dfrac{a \cdot b + 1}{a} = 8 \Rightarrow a \cdot b + 1 = 8a$

$3b = 8a \Rightarrow b = 8k, a = 3k$

$\dfrac{a+b}{b-a} = \dfrac{3k+8k}{8k-3k} = \dfrac{11k}{5k} = \dfrac{11}{5}$

Yanıt / Answer C

6. $\max(x-y) = \max(x) - \min(y)$

$= 5 - (-4) = 9$

Yanıt / Answer B

1.

$$\frac{a}{2} = \frac{2}{b} \Rightarrow a \cdot b = 4$$

$$a \cdot b \cdot c = 12$$

$$4 \cdot c = 12 \Rightarrow c = 3$$

Yanıt / Answer B

2.

$$\left(-\frac{1}{a}\right)^2 \cdot (-a^3)^{-4} \cdot \left(-\frac{1}{a^2}\right)$$

$$\frac{1}{a^2} \cdot a^{-12} \cdot (-a^{14})$$

$$-a^{-2-12+14} = -a^0 = -1$$

Yanıt / Answer A

3.

$$\left(\frac{4x^a}{x^{b+1}}\right)^2 \cdot \left(\frac{x^b}{2x^{a-1}}\right)^2$$

$$= \frac{16x^{2a}}{x^{2b+2}} \cdot \frac{x^{2b}}{4 \cdot x^{2a-2}}$$

$$= 4 \cdot x^{2a-2a+2} x^{2b-2b-2}$$

$$= 4 \cdot x^2 \cdot x^{-2} = 4$$

Yanıt / Answer B

4.

$$\frac{x^{-2} + y^{-2}}{x^{-1}y + y^{-1}x} = \frac{\dfrac{1}{x^2} + \dfrac{1}{y^2}}{\dfrac{y}{x} + \dfrac{x}{y}}$$

$$= \frac{\dfrac{y^2 + x^2}{x^2 \cdot y^2}}{\dfrac{y^2 + x^2}{x \cdot y}} = \frac{x \cdot y}{x^2 \cdot y^2} = \frac{1}{xy}$$

Yanıt / Answer D

5.

$$x + \frac{2}{x} - 3 = 0$$

$$x^2 - 3x + 2 = 0$$

$$\Rightarrow x_1 + x_2 = \frac{(-3)}{1} = 3$$

Yanıt / Answer E

6.

$$\frac{1}{x} + \frac{2}{y} = \frac{11}{2}$$

$$\frac{3}{x} + \frac{1}{y} = 24$$

$$\left.\begin{array}{l} \dfrac{2}{x} + \dfrac{4}{y} = 11 \\ \dfrac{3}{x} + \dfrac{1}{y} = 24 \end{array}\right\} \Rightarrow \frac{5}{x} + \frac{5}{y} = 35$$

$$5\left(\frac{1}{x} + \frac{1}{y}\right) = 35$$

$$\frac{1}{x} + \frac{1}{y} = 7$$

Yanıt / Answer C

1. $\dfrac{1}{2} - \dfrac{1}{2} + \dfrac{1}{3} - \dfrac{1}{\underset{(3)}{2}} - \dfrac{1}{\underset{(1)}{3}} + \dfrac{1}{6} = ?$

$$= \dfrac{-3+1}{6}$$

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

Yanıt / Answer A

2. $\left[\dfrac{12+1}{4} : \dfrac{9}{90}\right] + \dfrac{1}{2} =$

$\dfrac{13}{4} \cdot \dfrac{10}{1} + \dfrac{1}{2} =$

$\underset{(1)}{\dfrac{130}{4}} + \underset{(2)}{\dfrac{1}{2}} = \dfrac{132}{4} = 33$

Yanıt / Answer E

3. $\dfrac{1,7+1,5}{1,1-0,3} = \dfrac{3,2}{0,8} = \dfrac{32}{8} = 4$

Yanıt / Answer B

4. $36x - 90 = 12x + 30$

$36x - 12x = 30 + 90$

$24x = 120$

$x = 5$

Yanıt / Answer E

5. $\dfrac{x}{y} = \dfrac{7}{4} \Rightarrow x = 7k$

$\qquad\qquad\qquad y = 4k$

$x - y = \dfrac{3}{2}$

$7k - 4k = \dfrac{3}{2}$

$3k = \dfrac{3}{2}$

$k = \dfrac{1}{2} \Rightarrow y = 4 \cdot \dfrac{1}{2}$

$\qquad\qquad\quad y = 2$

Yanıt / Answer C

6. $\sqrt[3]{x-1} - \sqrt[3]{8(x-1)} + \sqrt[3]{125(x-1)} = 12$

$\sqrt[3]{x-1} - 2 \cdot \sqrt[3]{x-1} + 5\sqrt[3]{x-1} = 12$
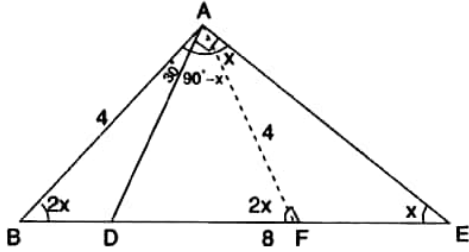
$4 \cdot \sqrt[3]{x-1} = 12$

$\sqrt[3]{x-1} = 3$

$x - 1 = 27$

$x = 28$

Yanıt / Answer E

31.

$$120° - x + 2x + 2x = 180°$$
$$3x = 180° - 120°$$
$$3x = 60°$$
$$x = 20°$$

Yanıt / Answer B

32.
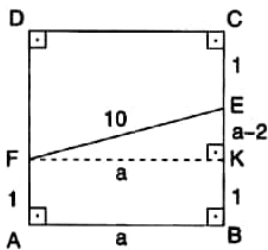$$3^2 + x^2 = 5^2 + 6^2$$
$$9 + x^2 = 25 + 36$$
$$x^2 = 61 - 9$$
$$x^2 = 52$$
$$x = 2\sqrt{13}$$

Yanıt / Answer B

33.

$\widehat{EFK}$
$$a^2 + (a-2)^2 = 10^2$$
$$a^2 + a^2 - 4a + 4 = 100$$
$$2^a - 4a - 96 = 0$$
$$a^2 - 2a - 48 = 0$$
$$\quad\quad\quad -8 \; +6$$
$$a = 8 \quad veya/or \quad a = -6$$
$$\Rightarrow A(ABCD) = 8^2 = 64 \, cm^2$$

Yanıt / Answer D

34. $A(\widehat{ABD}) + A(\widehat{ADC}) = \dfrac{16 \cdot 5}{2} = 40 \, cm^2$

Yanıt / Answer B

35. $75° + x = 180°$
$$x = 180° - 75°$$
$$x = 105°$$

Yanıt / Answer C

In the name of GOD

Answer Sheet **FESTTU**

Your Name		University Name		Year		Application Number	

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	26. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	51. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	76. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	27. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	52. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	77. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	28. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	53. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	78. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	29. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	54. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	79. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
5. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	30. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	55. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	80. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
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7. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	32. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	57. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	82. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
8. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	33. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	58. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	83. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
9. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	34. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	59. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	84. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
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13. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	38. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	63. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	88. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
14. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	39. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	64. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	89. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
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16. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	41. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	66. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	91. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
17. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	42. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	67. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	92. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
18. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	43. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	68. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	93. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
19. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	44. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	69. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	94. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
20. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	45. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	70. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	95. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
21. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	46. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	71. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	96. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
22. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	47. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	72. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	97. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
23. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	48. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	73. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	98. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
24. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	49. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	74. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	99. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
25. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	50. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	75. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	100. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

True Namber: **False Number:**   **Total Number:**

Answer Sheet **FESTTU**

Your Name		University Name		Year		Application Number	

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True Namber: **False Number:**   **Total Number:**

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