



A

ONDOKUZ MAYIS UNIVERSITY INTERNATIONAL STUDENT EXAM

May 22, 2021

NAME :

SURNAME :

ID NUMBER :

SIGNATURE : SEAT NUMBER:

IMPORTANT INFORMATION

- This booklet includes test questions for international students who wish to study in certain Turkish universities.
The number of questions are as follows:

Mathematics	40
Basic Learning Skills	40
- This is an "A" type booklet. Please mark the type of your booklet on the answer sheet as shown below, and make sure it has been confirmed by the exam supervisor.
If you do not code the booklet type correctly on the answer sheet, your exam will be invalid.
- You have **120 minutes** to complete the exam.
- Each question has only one correct answer. Multiple selections will be considered as incorrect.
- The answers to the questions given in the booklet should be marked by pencil on the answer sheet provided with this booklet. Please use a pencil. Do not fold the answer sheet and do not write anything not required on it.
- Inappropriate markings on the answer sheet will not be read by the optical reader. The candidate is responsible for the mistakes incurred by inappropriate markings.**
- Only correct answers will be calculated in this exam. You will not lose any points for incorrect answers.
- Further information about the examination rules are printed on the back cover of this booklet.

TYPE OF THE QUESTION BOOKLET

A ●	B ○
PARAPH	PARAPH

MATHEMATICS

1. The 30th odd number and 51st even number after 75 are the heights of Ahmet and Mehmet respectively. How tall Mehmet from Ahmet?

- A) 31 B) 33 C) 36
D) 38 E) 41

2. Let a, b, c be distinct positive integers.

If $\frac{a-b}{b} > 7$, $\frac{b+c}{c} < 8$, then what is the minimum value of $a+b+c$?

- A) 9 B) 12 C) 15
D) 20 E) 27

3. Let $x, y \in \mathbb{Z}$.

How many distinct y exists satisfying the equation $|x^2 - 8x + 18| + |y - 3| = 5$?

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

4. Let a and b be positive integers.

If $118! + 119! = 5^a b$, then what is the maximum value of a ?

- A) 23 B) 24 C) 26
D) 27 E) 28

5. If $\frac{6}{1+c^x} + \frac{1}{1+c^{-x}} = y$, then what is

$\frac{11}{1+c^x} + \frac{1}{1+c^{-x}}$ in terms of y ?

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

7. $\frac{2}{\sqrt[3]{25} + \sqrt[3]{5} + 1} - \frac{3}{\sqrt[3]{25} - \sqrt[3]{5} + 1} = ?$

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

6. $A = \{x \in \mathbb{R} \mid \sqrt{1+x} + \sqrt{2+x} + \sqrt{3+x} = 0\} = ?$

- A) \emptyset B) $\{1, 2, 3\}$ C) $\{-1, -2, -3\}$
 D) $\{-1\}$ E) \mathbb{R}

8. Which one of the following is a factor of $x^4 + 3x^2 + 4$?

- A) $x^2 + 2$
 B) $x^2 - 2$
 C) $x^2 + x - 2$
 D) $x^2 - x - 2$
 E) $x^2 - x + 2$

9. If $a^3 + 3 = 0$, then what is $\frac{1}{a^2 - a + 1}$ in terms of a ?

A) $-\frac{a+1}{2}$ B) $\frac{a-1}{3}$ C) $\frac{a-2}{2}$

D) $\frac{a+2}{2}$ E) $a+1$

10. For which value of y , x can not be found in

$$5x - 3y + xy - 15 = 0 ?$$

A) -7 B) -5 C) 0

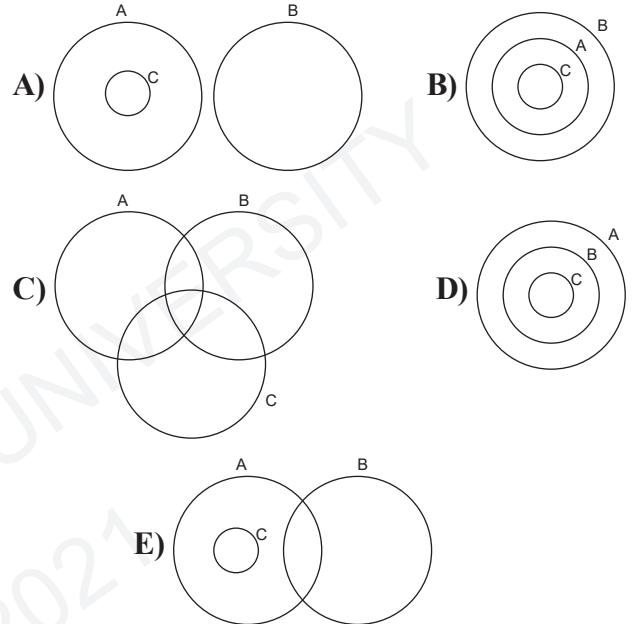
D) 2 E) 3

11. Which one of the following is true for

$$A = \{x \in \mathbb{R} \mid x = 2k, k \in \mathbb{Z}\}$$

$$B = \{x \in \mathbb{R} \mid |1-x| + |2-x| > x+3\}$$

$$C = \{x \in \mathbb{Z} \mid (0,25)^{3-x} = 4^{5-3x}\} ?$$



12. $h(ad) = h(a) + h(d)$

$$\frac{h(a^4)}{h(\sqrt[4]{a})} = ?$$

A) 12 B) 16 C) 20

D) 24 E) 28

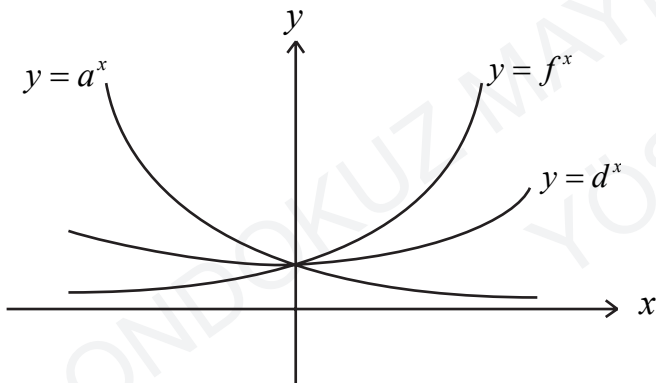
13. $h(3^{-x} + 3^x) = 9^{-x} + 9^x - 2$

$$f(x^3 + 4) = 1 - 4x$$

$$(foh)(-4) = ?$$

- A) -12 B) -9 C) -7
D) 7 E) 9

14.



What is the right order for a, d, f according to given exponential functions?

- A) $f > d > a$ B) $d > a > f$
C) $a > f > d$ D) $a = f = d$
E) $a = d > f$

15. What is the sum of maximum negative integer and minimum positive integer values of x satisfying $3x + 7 \equiv 12 \pmod{29}$?

- A) -17 B) -15 C) -11
D) 0 E) 13

16. If one wants to buy last floor of a building with 13 floors he/she must buy 12th floor.

How many different ways of buying 8 floors of this building?

- A) 729 B) 824 C) 957
D) 1024 E) 1287

17. Efe, Mete and Ege choose one card each from a box containing cards numbered from 1 to 9 and play a game.

If the total of their card numbers is a prime, then Efe wins. It is known that card number of Efe is 3.

What is the probability for Efe to win?

- A) $\frac{2}{7}$ B) $\frac{16}{27}$ C) $\frac{17}{28}$
 D) $\frac{19}{42}$ E) $\frac{17}{56}$

18. Let x_1, x_2 be the roots of

$$(4a^2 - 19a - 5)x^2 + a^2x + a + 3 = 0$$

Which one of the following is the

interval for a satisfying $x_1 < 0$, $x_2 > 0$ and $|x_1| - x_2 > 0$?

- A) $\left(-\frac{1}{4}, 5\right)$ B) $(-\infty, -3)$
 C) $(5, +\infty)$ D) $\left(-3, -\frac{1}{4}\right) \cup (5, +\infty)$
 E) $(0, 5)$

19. For the polynomial $P(x)$ we have $P(1) > 0$, $P(2) < 0$ and $P(3) > 0$.

Which one of the following is always true?

- I. There is at least one root between 1 and 2.
 II. There are more than one root between 2 and 3.
 III. There are two roots between 1 and 3.

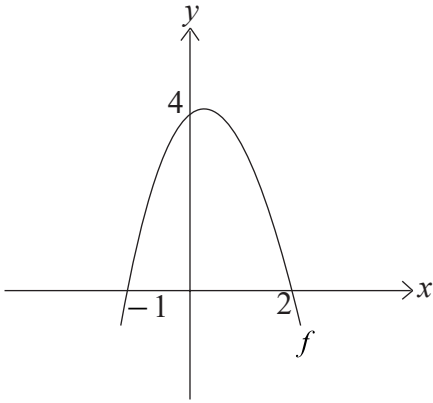
- A) Only I B) Only II C) I and II
 D) II and III E) I, II and III

20. The roots of $2m^2 - 7m - 1 = 0$ are $\cot x$ and $\cot y$.

$$\frac{\cot x + \cot y}{1 - \tan x \tan y} = ?$$

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

21.



Above the graph of function f is given.

Which one of the following functions is continuous at $x = 5$?

I. $\frac{f(x)}{(x-2)f(x-2)}$

II. $\frac{(x-2)^2}{f^2(x)}$

III. $\frac{f(x+1)}{f(x-3)}$

- A) Only I B) Only II C) I and II
D) I and III E) All of them

22. Let $\log_5 124! = a$, $\ln b = d$.

What is $\log_5 125! + \log b^3$ in terms of a and d ?

A) $6 + a + d$ B) $6 + a + \frac{d}{\log e}$

C) $3 + a + \frac{3d}{\log e}$ D) $3 + a + 3d \log e$

E) $6 + a + 3d$

23. Let $f, g : \mathbb{R} \rightarrow \mathbb{R}$ be differentiable functions

and $g'(5) \neq 0, f'(-3) = 3g'(5)$.

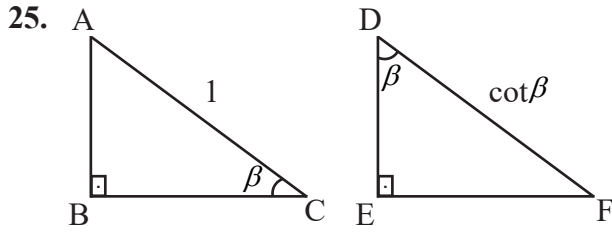
$$\lim_{h \rightarrow 0} \frac{f(h-3) - f(-3)}{g(5+h) - g(5)} = ?$$

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

24. Let $F_n + F_{n+1} = F_{n+2}$, $F_1 = F_2 = 1$ be a Fibonacci sequence.

If $a + b + c + d = 1364$ and $a + d = 754$ for consecutive terms a, b, c, d of this sequence, then $d = ?$

- A) 34 B) 55 C) 144
D) 377 E) 610



\widehat{ABC} and \widehat{DEF} are right triangles.

$$\lim_{\beta \rightarrow 0} \frac{|DF| \cdot |AB| - |EF|}{|BC|} = ?$$

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

26. The function

$$f(x) = \begin{cases} b \frac{|x-1|}{x-1} + 1, & x \in (-\infty, 1) \cup (1, 2) \\ x^2 + a, & x \in (2, +\infty) \end{cases}$$

has a limit for every $x \in \mathbb{R}$. $a + b = ?$

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

27. How many points c exist for the function

$$g(x) = \frac{-5}{(x-1)^2 (x+3)^3 (x-3)^2 (x-5)(x-4)^2},$$

where g has a limit at c but not continuous at c ?

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

28. $\cos 10^\circ \cos 20^\circ \cos 40^\circ = ?$

- A) $\frac{1}{4} \cot 10^\circ$ B) $\frac{1}{4} \tan 10^\circ$
C) $\frac{1}{8} \tan 10^\circ$ D) $\frac{1}{8} \cot 10^\circ$
E) $\frac{1}{4} \cos 10^\circ$

29. $f: \mathbb{R} \rightarrow \mathbb{R}$

$$(\cos x)' = -\sin x$$

$$f(x) = \sqrt[3]{x-1}(1 - \cos(x-1))$$

$$f'(1) = ?$$

- A) Does not exist B) -1 C) 0
D) 1 E) 2

30. What is the product of x satisfying the equation $x^{\log_3 x} = 6561x^7$?

- A) $\frac{1}{3^7}$ B) $\frac{1}{3^6}$ C) 3^6
D) 3^7 E) 3^8

31. $f(x) = \begin{cases} x+1, & x < 0 \\ x^2, & x \geq 0 \end{cases}$
 $\int_1^3 f(x-2) dx = ?$

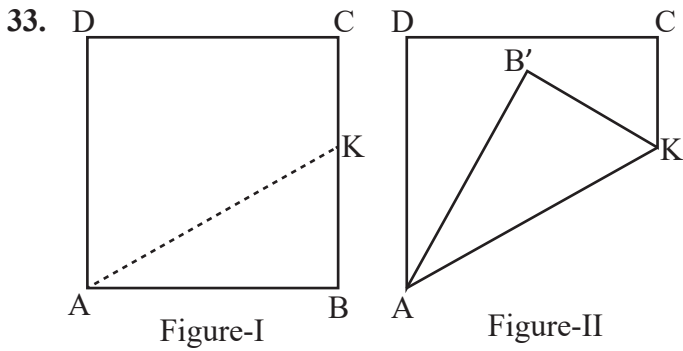
- A) 0 B) $\frac{1}{12}$ C) $\frac{1}{6}$
D) $\frac{2}{3}$ E) $\frac{5}{6}$

32. Let $y = f(x)$ be a continuous function with

period 3 and $\int_0^6 f(x) dx = 8$.

$$\int_{-1}^{14} f(x) dx = ?$$

- A) 40 B) 20 C) 10
D) 8 E) 4

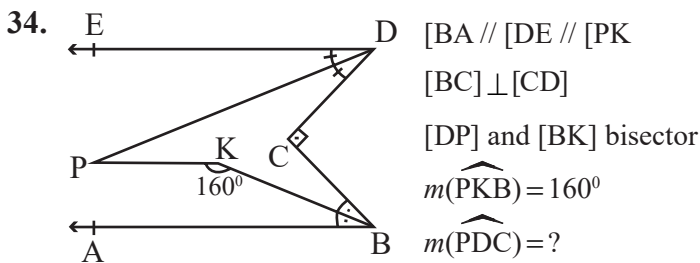


The vertex B of square ABCD in Figure-I changes to B' in Figure-II after folding through AK.

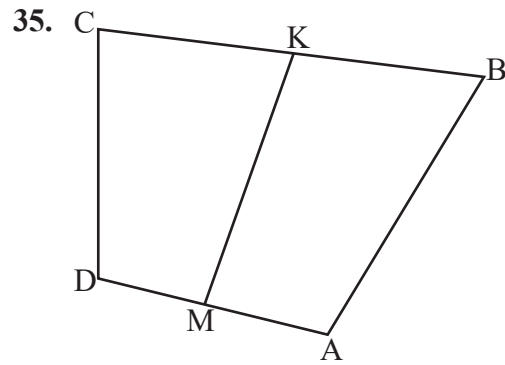
Which one of the following are true?

- I. If $0^\circ < m(\widehat{B'KC}) < 90^\circ$, then AB'B is an obtuse angle triangle.
- II. $m(\widehat{CKB'})$ and $m(\widehat{B'AD})$ are complementary angles.
- III. If $m(\widehat{CKB'}) = 30^\circ$ and $|DC| = \sqrt{3}$ unit, then $\text{Area}(B'AD) = \frac{3\sqrt{3}}{2}$ units square.

- A) Only I B) Only III C) II and III
- D) I and II E) All of them



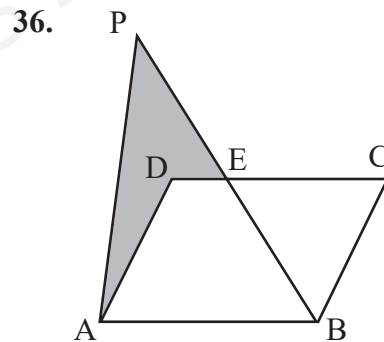
- A) 15° B) 20° C) 25°
- D) 30° E) 35°



ABCD is a quadrangle,
 $|CK| = |KB|$, $|DM| = |MA|$
 $|DC| = 12$ units, $|AB| = 22$ units, $|MK| = x$

How many distinct integers x are there?

- A) 8 B) 9 C) 10
- D) 11 E) 12



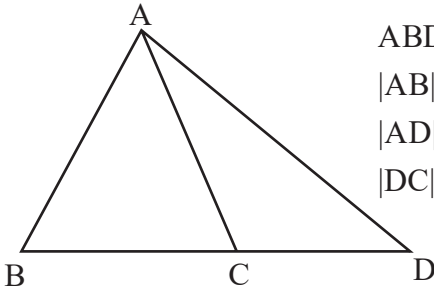
ABCD is a parallelogram,

$$\text{Area}(ADEP) = \text{Area}(\triangle BEC)$$

$$\frac{|PE|}{|EB|} = ?$$

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

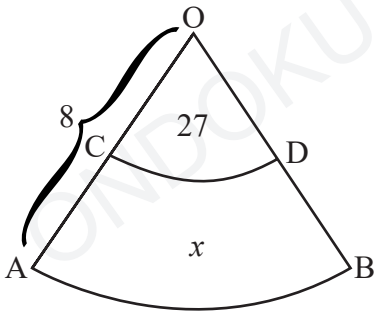
37.



ABD is a triangle,
 $|AB|=|AC|=5$ units
 $|AD|=7$ units
 $|DC||DB|=?$

- A) 12 B) 16 C) 20
 D) 24 E) 28

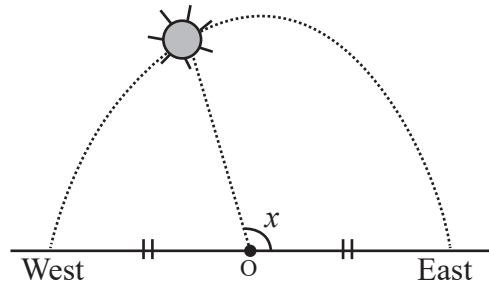
38.



In the circle segments with center O,
 $|OD|=3$ units, $|OA|=8$ units
 $\text{Area}(OCD)=27$ units square.
 $\text{Area}(ABDC)=x=?$

- A) 105 B) 135 C) 165
 D) 195 E) 225

39.



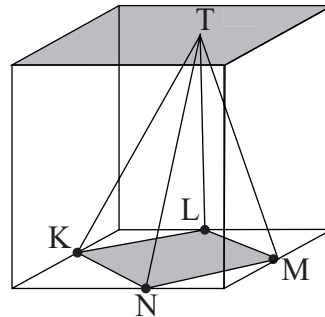
It is known that sun rises at 7.30 and sunsets at 22.30.

Sun follows a trace of half circle.

According to the position of sun at 15.30, what is $x = ?$

- A) 92° B) 96° C) 108°
 D) 124° E) 144°

40.



K, L, M, N are the midpoints of base edges of the quadrangular and T is a point on the floor.

What is the ratio of the volume of the pyramid (T, KNML) to the volume of the quadrangular?

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

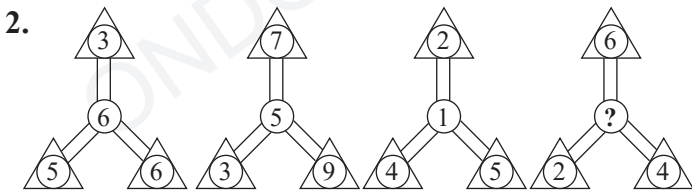
Mathematics Test is completed.

BASIC LEARNING SKILLS

1.

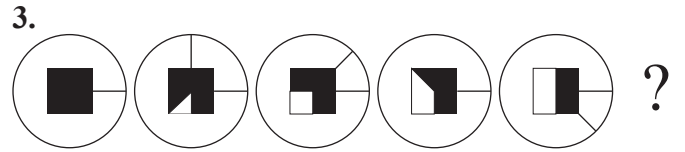
24	25	82	72	X=?
61	23	46	X	

- A) 25 B) 80 C) 86
 D) 92 E) 94



Which one of the following should be replaced in the question mark (?)?

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

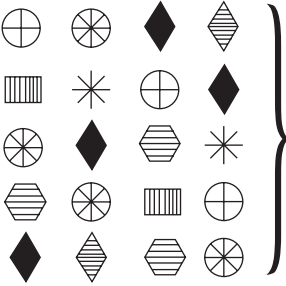


Which one of the following should be replaced in the question mark (?)?

- A) B) C)
 D) E)

4. Which is the odd one out?

- A) B)
 C) D)
 E)

5.  } $9372 \quad 7825$
 $3598 \quad 2356$
 5693

Each figure corresponds to a digit. Which one of the following corresponds to     ?

- A) 6957 B) 6892 C) 6325
 D) 6278 E) 6239

6.

























































31	27	35	A	39	19
----	----	----	---	----	----

66	70	B	74	58	78
----	----	---	----	----	----

Which one of the following should replaced A and B, respectively?

- A) (47,62) B) (62,23) C) (47,67)
 D) (23,62) E) (23,78)






7.

	4	
6	8	6
	4	

Each digit denotes a distinct symbol.

Which one of the following corresponds 8 according to given piece?

- A)  B)  C) 
 D)  E) 

8.

M	I	S
I	S	I
R	I	R

How many MISIR can be written, moving only right, left, up, down?

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

Solve questions 9-10 according to explanation below.

	I.	II.	III.
1.			
2.			
3.	11		
4.	12		10

Numbers from 1 to 9 are placed in the empty boxes such that the sum of columns (I, II, III) are equal.

9. Which one of the following may not be on the same row with 3?

- A) 9 B) 8 C) 7 D) 6 E) 4

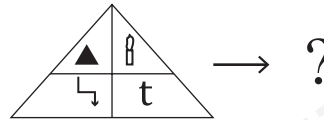
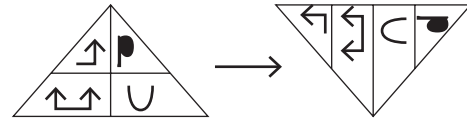
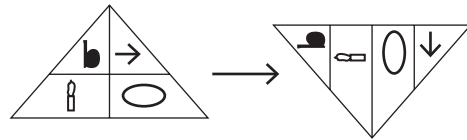
10.

		9
	6	
11		
12		10

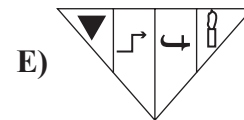
Which one of the following can not be the sum of the first row of the next figure?

- A) 20 B) 19 C) 18 D) 17 E) 16

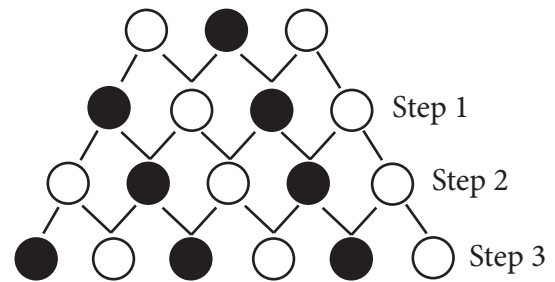
11.



Which one of the following should be replaced in the question mark (?)?

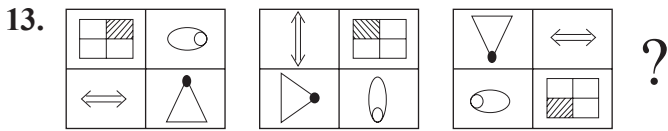


12.

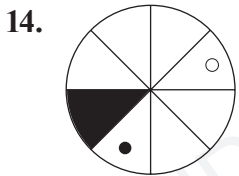
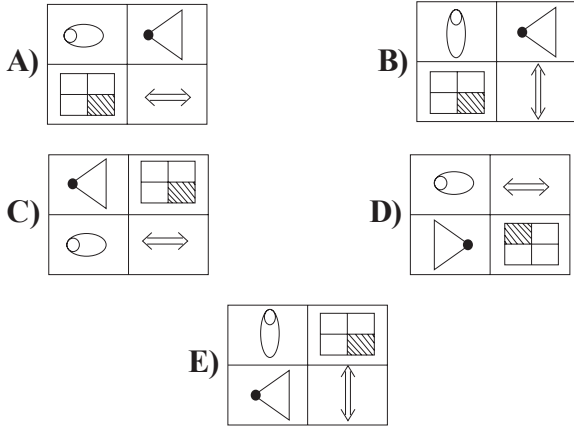


How many ● are there at step 19?

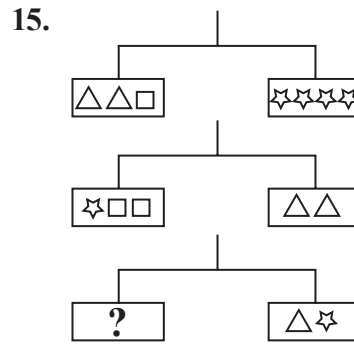
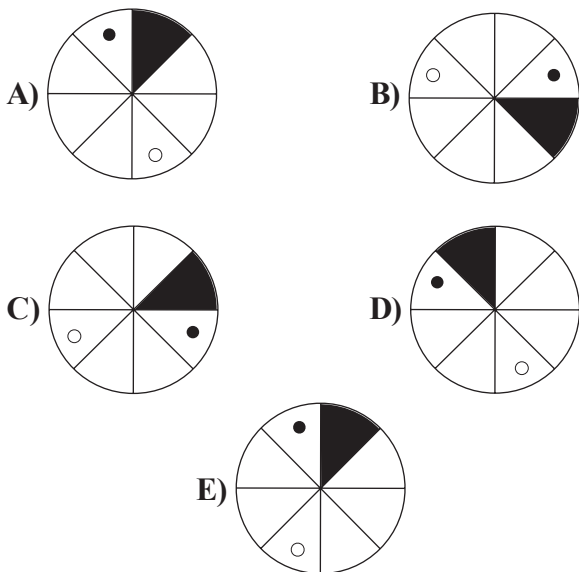
- A) 10 B) 11 C) 12 D) 13 E) 14



Which one of the following should be replaced in the question mark (?)?



Which one of the following is rotated at an angle of 255° clockwise yields the above figure?



Which one of the following should be replaced in the question mark (?)?

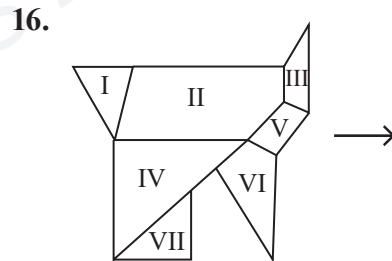
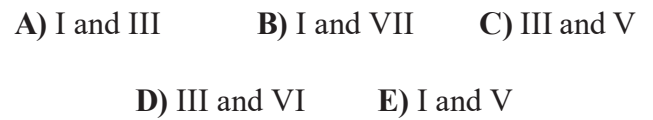
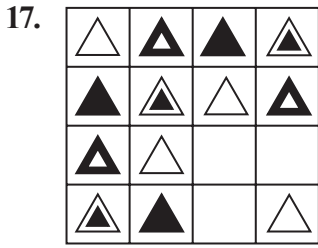


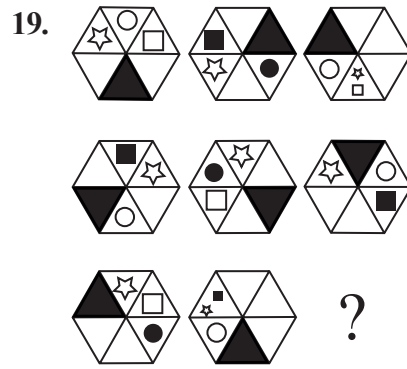
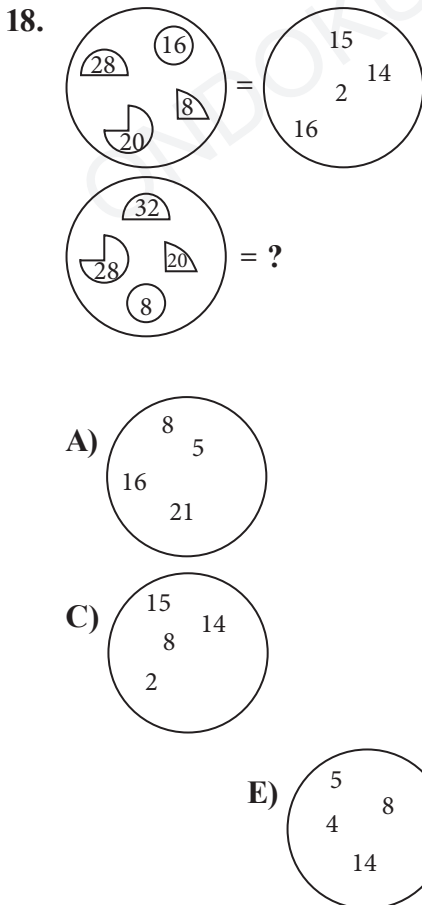
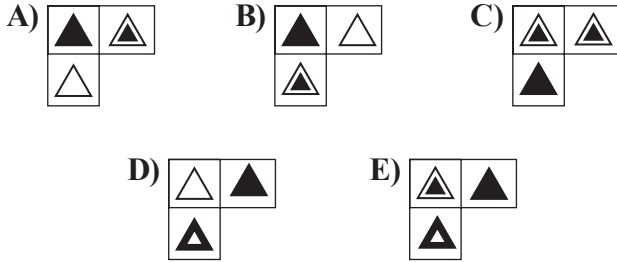
Figure -1 Figure -2

Figure 2 is obtained by deleting two parts from Figure 1. What are they?

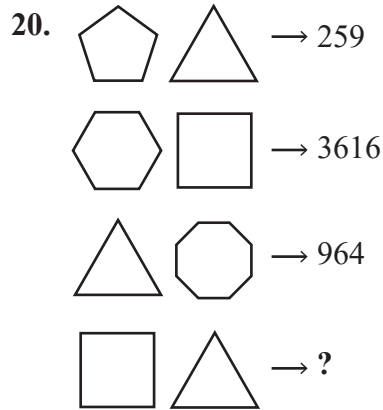
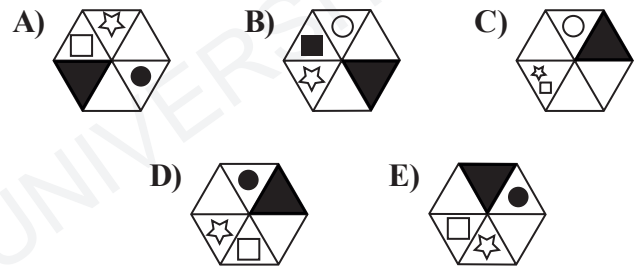




Which one of the following is the missing part?



Which one of the following should be replaced in the question mark (??)



Which one of the following should be replaced in the question mark (??)

- A) 169 B) 1625 C) 1816
- D) 2512 E) 9636

21.

△☆○			☾☒

	○	☾	
△	☆	☒	☒

	☾	○	
△	☒	☆	☒

?

Which one of the following should be replaced in the question mark (?)?

A)

○			☒
	☆	☾	
△			☒

B)

			☒
	☆	☾	
	○	△	
☒			

C)

☾			○
△☒			☆☒

D)

	☒	☒	
☆			☾
△			○

E)

	○	☾	
△☒			☆☒

22. SAASFRFTAASRRFTTRRAFSASAASRS
FASTRFTRTATSTSSFEARSTTF

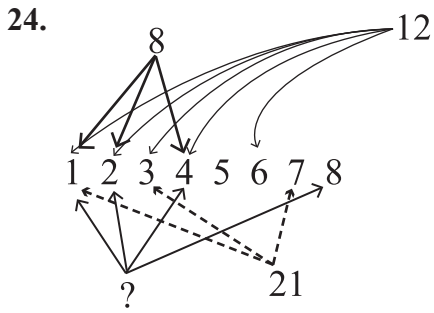
Which letter is the most appearing one in the above letter group?

- A) A B) F C) R D) S E) T

23.

Which one of the following should be replaced in the question mark (?)?

- A)
- B)
- C)
- D)
- E)



Which one of the following should be replaced in the question mark (?)?

- A) 16 B) 24 C) 36 D) 48 E) 64

25. $\frac{\square}{\triangle} = \frac{\triangle}{\star}$, $\square + \triangle = 30$, $\star - \triangle = 9$

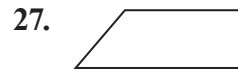
$\triangle (\square - \triangle) - 9\star = ?$

- A) -270 B) -351 C) 0
D) 270 E) 351

26. The numbers below are written according to a rule. Which one of the following should replace the question mark (?)?

3 4 7 16 ? 124 367

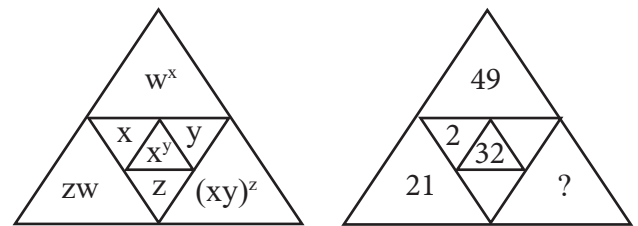
- A) 111 B) 87 C) 68
D) 43 E) 37



The figure above can be created with which of the following?

- A) B)
C) D)
E)

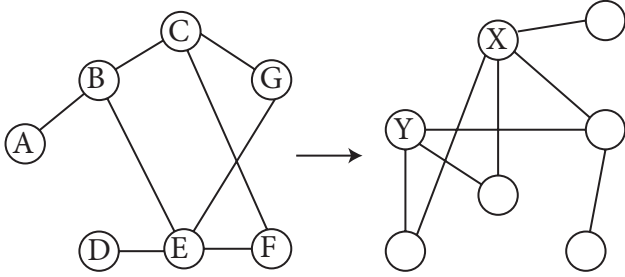
28.



Let x, y, z, w be integers. Which one of the following should be replaced in the question mark (?)?

- A) 10^2 B) 10^3 C) 10^4
D) 10^5 E) 10^6

29.



X ; Y=?

- A) E ; C B) A ; B C) D ; E
 D) A ; G E) E ; F

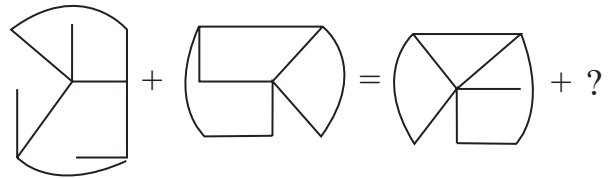
30.



There is a relation between the above numbers and figures. Which one of the following should be replaced in the question mark (??)?

- A) 18 B) 16 C) 15
 D) 14 E) 12

31.



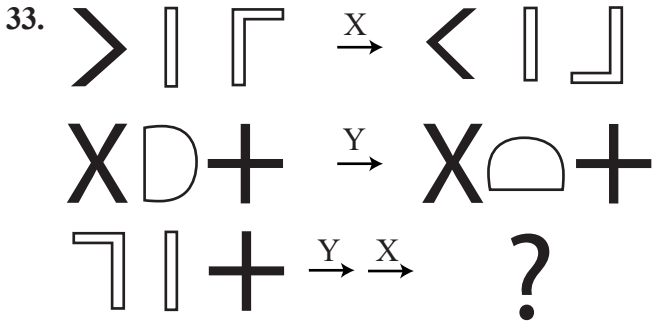
Which one of the following should be replaced in the question mark (??)?

- A) B)
 C) D)
 E)

32. 38 - 35 - 15 - 31 - 28 - 15 - 24 - ? - ?

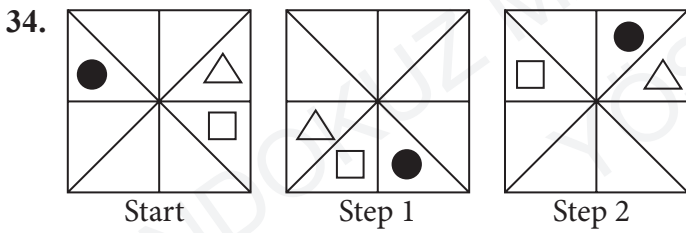
Which one of the following should replace the question marks (?? - ??)?

- A) 20 - 17 B) 21 - 15 C) 21 - 18
 D) 15 - 20 E) 20 - 15



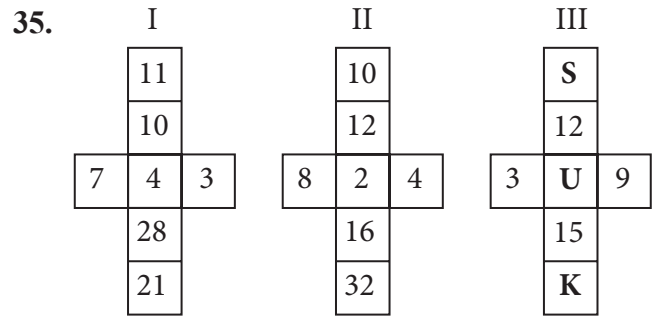
Which one of the following should be replaced in the question mark (?)?

- A) B) C) D) E)



Which one of the following is step 8?

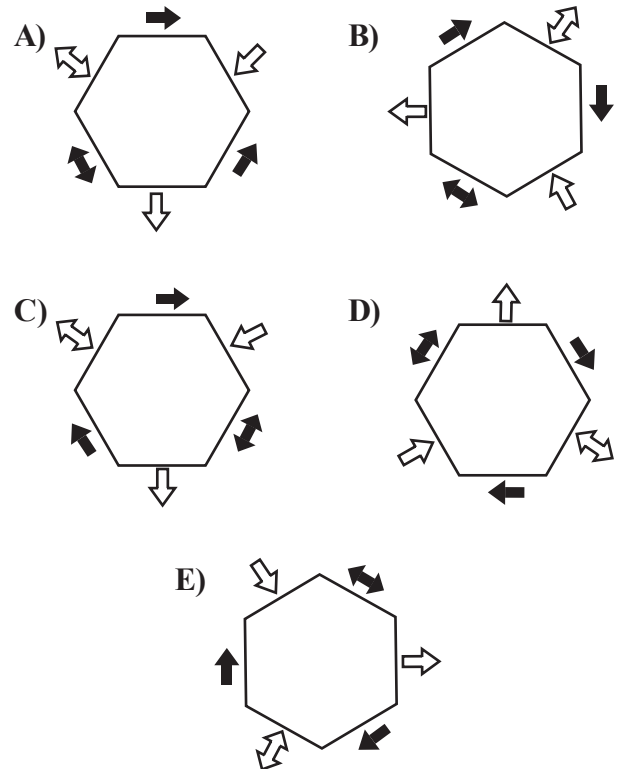
- A) B) C) D) E)

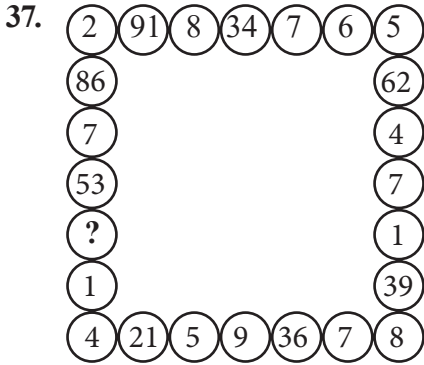


What is $S + U + K$ according to the rule for I and II?

- A) 50 B) 40 C) 30
D) 20 E) 10

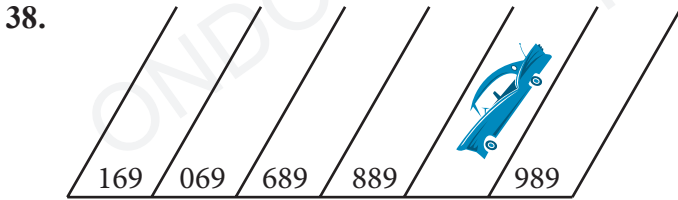
36. Which is the odd one out?





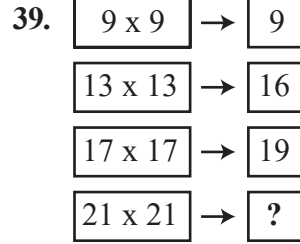
Which one of the following should be replaced in the question mark (?)?

- A) 3 B) 5 C) 9
D) 17 E) 88



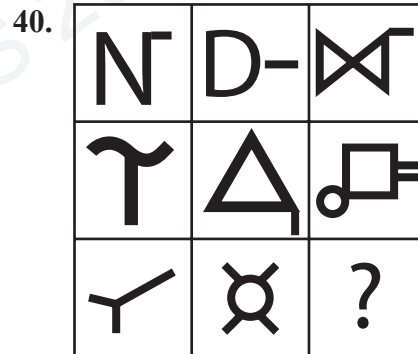
Which number is the car parked?

- A) 687 B) 789 C) 896
D) 900 E) 988



Which one of the following should be replaced in the question mark (?)?

- A) 27 B) 24 C) 18
D) 9 E) 8



Which one of the following should be replaced in the question mark (?)?

- A)
- B)
- C)
- D)
- E)



A

EXAMINATION RULES

1. Following materials are prohibited in exam room: **Mobile phones** and any communication equipments e.g. pagers, walkie-talkies, PDA's, watches with any other functions, weapons, notebooks, books, dictionaries, any electronic device with dictionary function, calculators, calculation charts, compasses, goniometers, rulers and etc. If any candidate enters the exam room with the prohibited materials, his/her name will be recorded and their examinations will be considered invalid.

2. Duration of the exam is **120** minutes. Candidates are allowed to take the exam if they are not late for more than **30** minutes. Candidates are not allowed to leave the exam room in the first **60** minutes and the last **5** minutes of the examination. Candidates who completed the exam or left the examination room will not be allowed to re-enter the examination room. If you complete the exam before the end of the duration you can leave the room after submitting your question booklet and answer sheet. When the end of the examination is announced you must remain seated and may not leave the examination room until all papers are collected by the invigilators.

3. Communicating with the invigilators during the examination is prohibited. Similarly, it is prohibited for the staff to talk to candidates privately. Candidates are not allowed to exchange pencils, erasers, papers etc. during the exam.

4. The exam of any candidate who cheats, attempts to cheat or assists cheating will be considered invalid and his/her identity will be recorded. Invigilators do not have to warn the students about cheating. The candidate is responsible for his/her actions. Answers of the candidates will be examined electronically. If any suspicious case is detected regarding individual or collaborate cheating, the exams of all candidates who participate in this action will be considered invalid. If invigilators report any case of misconduct in the application of the exam or collaborate cheating, OMÜ-YÖS Coordinating Office may decide to consider all of the candidates' exams invalid for that room.

5. All candidates must obey the rules in the exam room. If necessary, your seat may be changed by invigilators. Obeying the rules is of utmost importance for validation of the exam. Identity of any candidate who engages in misconduct and does not heed the invigilator's warning to discontinue the behavior, will be recorded and his/her

examination will be considered invalid.

6. You must fill all the required fields on the answer sheet. Only pencils should be used for marking and writing on the answer sheet. Pens or ball point pens should not be used. All the answers should be marked on the answer sheet. Answers marked on the question booklet will be considered invalid.

7. Please check your question booklet for missing pages or typos after receiving it. If there are any missing pages or typos on your booklet, please immediately request for the change of the booklet from the head invigilator. You should also check if the booklet type written on the cover page is the same as the booklet type written on every page of the booklet. If you find any difference, please request a new booklet from the head invigilator. If you realise any difference about booklet types after you start the examination, request a new booklet of the same type you have answered. Please mark your booklet type on the "Question Booklet Type" area on the answer sheet. Booklet type you have marked will be checked by the invigilators and initialed with a pen. If the related area is not initialed, your answer sheet will not be evaluated. If there is difference between the booklet types that you have marked and the invigilator has marked, evaluation will be based on the one that is marked by invigilators.

8. Please write your name, surname and candidate number on the question booklet before starting to answer the questions. All the question booklets and answer sheets will be collected and examined at the end of the examination. In case of missing pages, examination of the related candidate will be considered invalid.

9. You can use the spaces on the question booklet for calculation.

10. Smoking (cigarettes, pipes, cigars etc.) is not allowed during the examination for both candidates and the staff.

11. Writing the questions and/or the answers and taking it out is strictly prohibited.

12. Do not forget to submit your question booklet and answer sheet before leaving the exam room.