ONDOKUZ MAYIS UNIVERSITY

2020

INTERNATIONAL STUDENT EXAM (OMÜ YÖS)

A

ENGLISH

ONDOKUZ MAYIS UNIVERSITY
INTERNATIONAL STUDENT EXAM
July 18, 2020

NAME : .....

SURNAME : .....

ID NUMBER : .....

SIGNATURE : SEAT NUMBER: .....

IMPORTANT INFORMATION

1. 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**

2. 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.
3. You have **120 minutes** to complete the exam.
4. Each question has only one correct answer. Multiple selections will be considered as incorrect.
5. 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.
6. **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.**
7. Only correct answers will be calculated in this exam. You will not lose any points for incorrect answers.
8. 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. **What is the sum of roots of** $x+5\sqrt{x}-36=0$**?**

A) -81 **B)** -16 **C)** 0

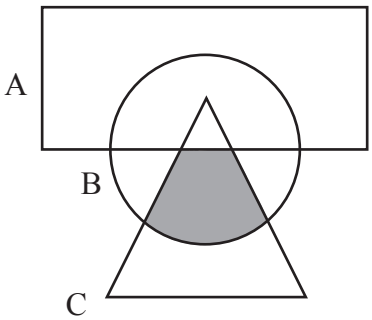
D) 16 **E)** 81

2. $\sqrt{11+\sqrt{21}}-\sqrt{11-\sqrt{21}}=?$

A) $-\sqrt{21}$ **B)** $-\sqrt{2}$ **C)** 0

D) $\sqrt{2}$ **E)** $\sqrt{21}$

3.



Which one of the following is the shaded region in the figure?

A) $C-A$ **B)** $B\cap C$

C) $(B\cup C)-A$ **D)** $A\cap B\cap C$

E) $(B\cap C)-A$

4. $2020-2018+2016-2014+\ldots-14=?$

A) 1006 **B)** 1004 **C)** 1002

D) 1000 **E)** 998

5. **If** $a,b\in\mathbb{Z}$,
$|a-b-1|+|3a+2b-15|=1$**, then** $a+b=?$

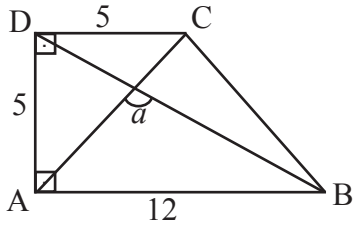
A) 6 **B)** 7 **C)** 8 **D)** 9 **E)** 10

6. **Which one of the following divides** $2^{20}+2^{11}-24$ **without remainder?**

A) $2^{10}-6$ **B)** $2^{10}-2$ **C)** $2^{10}+2$

D) $2^{10}+4$ **E)** $2^{10}+6$

7.



ABCD right trapezoid, |DC| = |AD| = 5 units, |AB| = 12 units sin$a$ = ?

A) $\frac{5}{13}$ **B)** $\frac{7\sqrt{2}}{13}$ **C)** $\frac{17\sqrt{2}}{26}$

D) $\frac{12}{13}$ **E)** 1

8. **Let $x^2 < x$, $xy > y$. Which one of the following is always true?**

A) $y - x > 0$
B) $2x + y > 0$
C) $2xy < 0$
D) $x^2y > 0$
E) $3x - 5y < 0$

9. **If $(x-3)^{|x+5|-8} = 1$, then what is the sum of possible values of x?**

A) -9 **B)** -6 **C)** -4

D) 4 **E)** 6

10. **If** $s(B' - A') = 4$
$s(B - A) = 6$
$s(A) = 9$

then what is the number of subsets of B with at most 2 elements?

A) 63 **B)** 64 **C)** 65

D) 66 **E)** 67

11. **If $a = 2 + \sqrt{15}$, then what is $\sqrt[3]{\sqrt{15} + \frac{196}{54}}$ in terms of a?**

A) $\frac{a+1}{6}$ **B)** $\frac{a+1}{3}$ **C)** $\frac{a}{3}$

D) $\frac{a}{6}$ **E)** $\frac{a}{2}$

12. **3 of 10 elective courses are being delivered at the same time. How many possibilities are there to take 5 courses?**

A) 24 **B)** 60 **C)** 96

D) 126 **E)** 161

13. **If** $\binom{10}{2}+\binom{10}{4}+\ldots+\binom{10}{10}=x$

$\binom{10}{3}+\binom{10}{5}+\ldots+\binom{10}{9}=y$,

then $x+y-1=?$

A) 1013 **B)** 1012 **C)** 1011

D) 1010 **E)** 1009

14. **Let x, y, z be prime digits. What is the remainder of the smallest negative number generated by these digits divided by 11?**

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

15. **If $m \in \mathbb{Z}$, then what is the leading coefficient of the polynomial** $P(x)=4x^{\frac{13}{m-5}}-6x^{25-2m}+4x^{13}+5x^{10}-4$ **?**

A) 3 **B)** 2 **C)** -2

D) -3 **E)** -4

16. **What is the multiplication of real x's satisfying** $x^2+5|x|-14=0$ **?**

A) -49 **B)** -4 **C)** 0

D) 49 **E)** 196

17. **If** $f:\mathbb{R}\to\mathbb{R}, f(x)=5^{x+3}$, **then** $f(a+b-1)=?$

A) $25f(a+b)$ **B)** $5f(a+b)$

C) $f(a+b)$ **D)** $\frac{f(a+b)}{5}$

E) $\frac{f(a+b)}{25}$

18. **Let (a_n) be a geometric sequence.**

If $\frac{a_6}{a_3}=8$, **then** $\frac{a_{12}}{a_8}=?$

A) 2 **B)** 4 **C)** 6 **D)** 8 **E)** 16

19. Let (a_n) be an arithmetic sequence. If $a_7 = x$, then $a_5 + a_9 = ?$

A) x **B)** $2x$ **C)** $3x$

D) $\frac{x}{2}$ **E)** $\frac{x}{4}$

20. If today is Monday, then what day is it 115 days before?

A) Monday
B) Tuesday
C) Wednesday
D) Thursday
E) Friday

21. If $\log_x 81 = 8$ and $\log_3 x = y$, then $xy = ?$

A) $\frac{1}{2}$ **B)** $\frac{\sqrt{2}}{2}$ **C)** $\frac{\sqrt{3}}{2}$

D) $\sqrt{3}$ **E)** $\sqrt{5}$

22. Which one of the following is the solution set of real x satisfying $\log_{\frac{1}{7}}(12-x) \le \log_{\frac{1}{7}}(x^2)$?

A) $(-\infty, 3) - \{0\}$ **B)** $(-\infty, -4)$

C) $[-4, 3] - \{0\}$ **D)** $[3, \infty)$

E) $[-4, \infty)$

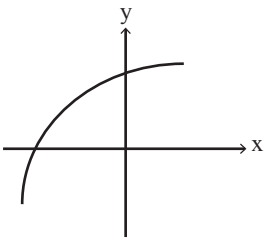
23. If $x, y \in \mathbb{Z}$

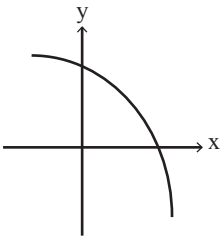
$23! = 2^x 5^y k$

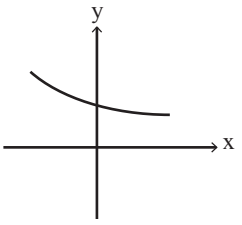
and k is an even number, then what is the maximum of $x + y$?

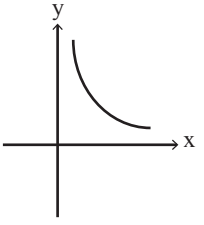
A) 19 **B)** 20 **C)** 21 **D)** 22 **E)** 23

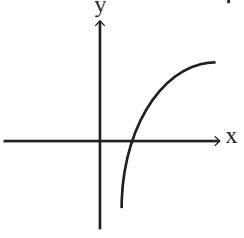
24. Which one of the following may be the graph of an expoential function?

A)


B)


C)


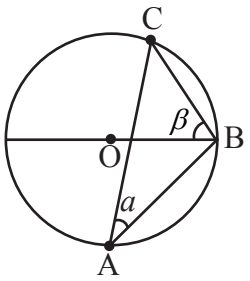
D)


E)


25. **What is the 153rd digit of $2,\overline{1897}$ after comma?**

A) 1 **B)** 2 **C)** 7 **D)** 8 **E)** 9

26.



$m(\widehat{OBC}) = \beta$, $m(\widehat{CAB}) = a$ **for the circle with center O.**

If $\sin a = x$, **then** $\cos\left(\frac{\pi}{2} - 2\beta\right) = ?$

A) $\frac{\sqrt{1-x^2}}{x}$ **B)** $\sqrt{1-x^2}$

C) x **D)** $2x\sqrt{1-x^2}$

E) $2x^2$

27. **The constant term of the polynomial** $P(x) = (x^2 + x - 7)Q(x+1) + 2x + 1$ **is** -20. **What is the sum of coefficients of the polynomial** $Q(x)$**?**

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

28. **If** $x^2 + x + 1 = 0$, **then** $x^{2013} + x^{2023} = ?$

A) $x - 1$ **B)** $x + 1$ **C)** $x^2 + 1$

D) $x^2 - 1$ **E)** $x^2 + x + 1$

29. $\left.\begin{array}{l} x + y = 1 \\ \frac{1}{x} + \frac{1}{y} = -\frac{1}{5} \end{array}\right\} \Rightarrow |x - y| = ?$

A) $\sqrt{21}$ **B)** $\sqrt{31}$ **C)** $\sqrt{41}$

D) $\sqrt{51}$ **E)** $\sqrt{61}$

30. **If** $\frac{3}{4^x + 2^x + 1} = 2^x - 1$, **then** $x = ?$

A) $\frac{2}{3}$ **B)** $\frac{5}{6}$ **C)** $\frac{4}{3}$

D) $\frac{3}{2}$ **E)** $\frac{5}{2}$

31. $f(x)=2(x-1)$

$\Rightarrow \underbrace{(fofo...of)}_{50 \text{ times}}(x)=?$

A) $2^{50}(x-1)-2$ **B)** $2^{50}(x-1)$

C) $2^{50}(x-2)+2$ **D)** $2^{50}(x-2)-2$

E) $2^{51}(x-1)$

32. **If** $(foh)(x)=4h(x)-2$

$(hof)(x)=5f(x)+3$,

then $f(0)+(foh)(-2)=?$

A) -32 **B)** -16 **C)** 0

D) 16 **E)** 32

33. **If lines** $ax+\sqrt{3}y-4=0$

$2x-\sqrt{2}y+b\sqrt{6}=0$

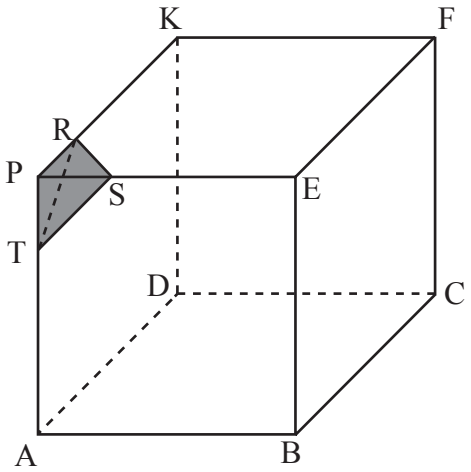
are paralel, then which one of the following may be (*a*,*b*)?

A) $\left(\sqrt{6},\frac{4}{3}\right)$ **B)** $\left(-\sqrt{6},\frac{4}{3}\right)$

C) $\left(\sqrt{6},-\frac{4}{3}\right)$ **D)** $\left(\sqrt{6},\sqrt{6}\right)$

E) $\left(-\sqrt{6},-\frac{4}{3}\right)$

34.

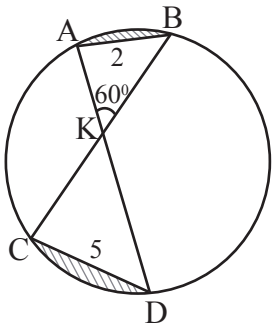


If $3|PT|=2|TA|$, $3|PR|=2|RK|$, $3|PS|=2|SE|$ for the cube in figure, then what is the ratio of the pyramid (T,PRS) to the volume of the cube?

A) $\frac{4}{375}$ **B)** $\frac{8}{375}$ **C)** $\frac{4}{25}$

D) $\frac{8}{25}$ **E)** $\frac{4}{5}$

35.



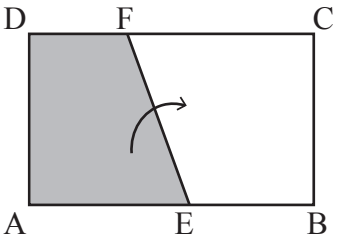
If $|AB|=2$ units, $|CD|=5$ units, $m(\widehat{AKB})=60^0$ for the circle, then what is the area of sum of shaded regions?

A) $13\pi-\frac{\sqrt{3}}{4}$ **B)** $\frac{13\pi}{2}-\frac{\sqrt{3}}{4}$

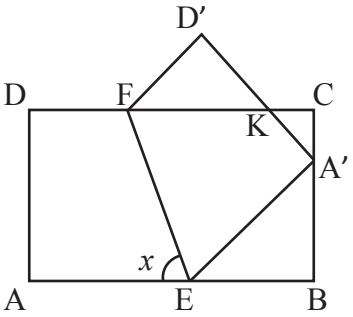
C) $\frac{13\pi}{3}-\frac{21\sqrt{3}}{4}$ **D)** $\frac{13\pi}{3}-\frac{23\sqrt{3}}{4}$

E) $\frac{13\pi}{6}-\frac{25\sqrt{3}}{4}$

36.



In the above rectangle ABCD the region AEFD is folded through [EF] and below figure is obtained.



Which one of the following is sufficient alone to find the angle x?

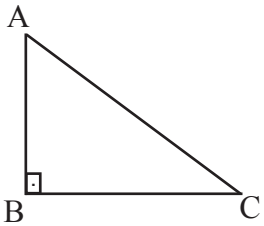
I. $m(\widehat{BA'E})$

II. $m(\widehat{D'FK})$

III. $m(\widehat{D'KC})$

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

37.

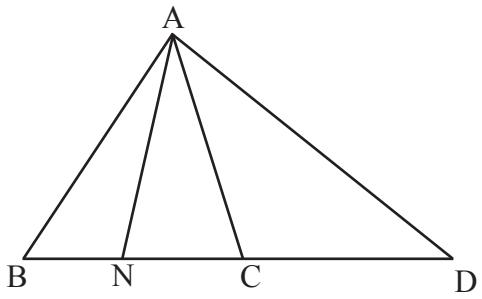


ABC triangle
$[AB]\perp[BC]$
$m(\widehat{BAC})=75^0$
$|AC|=6\sqrt{3}$ units
$A\left(\overset{\Delta}{ABC}\right)=?$

A) $\frac{9}{2}$ **B)** 9 **C)** $\frac{27}{2}$

D) 27 **E)** 108

38.



ABC triangle
[AN] internal bisector
[AD] exterior bisector
$|AN| = n_a$
$|AD| = n_a'$
Which one of the following relation exists for lengths of bisectors?

A) $\frac{n_a}{n_a'} = \frac{|AB|}{|AC|}$

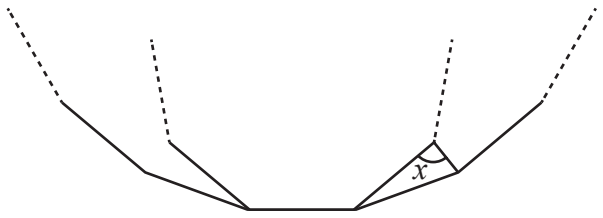
B) $(n_a)^2 + (n_a')^2 = |ND|^2$

C) $(n_a + n_a')^2 = |BD| - |ND|$

D) $n_a = n_a'$

E) $(n_a)^2 + (n_a')^2 = [|CD| + |BN|].[|CD| + |NC|]$

39.



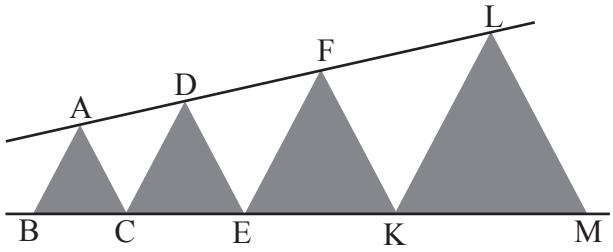
In the above figure, a regular octadecagon (outside) and a regular nonagon is given.

$x = ?$

A) 70^0 **B)** 75^0 **C)** 80^0

D) 85^0 **E)** 90^0

40.



In the shaded isosceles triangles A, D, F, L and B, C, E, K, M are linear.
$|BC| = 1$ unit
$|CE| = 2$ units
$|EK| = 4$ units
$|KM| = 16$ units. $\frac{|AF|}{|AL|} = ?$

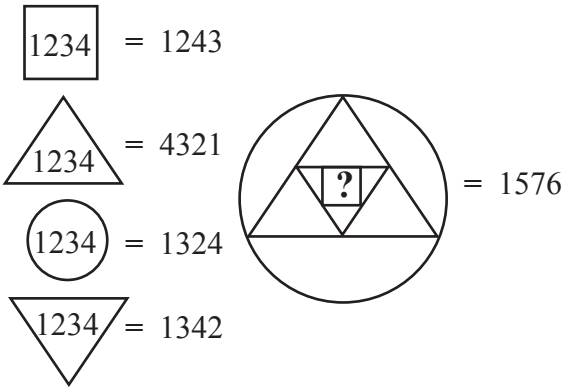
A) $\frac{1}{29}$ **B)** $\frac{2}{29}$ **C)** $\frac{3}{29}$

D) $\frac{8}{29}$ **E)** $\frac{9}{29}$

Mathematics Test is completed.

BASIC LEARNING SKILLS

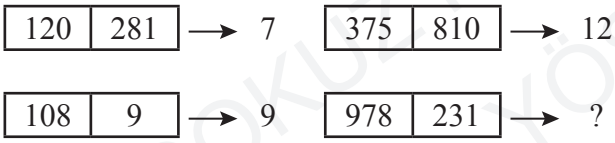
1.



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

A) 1567 **B)** 5167 **C)** 6175 **D)** 6571 **E)** 1756

2.



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

A) 11 **B)** 12 **C)** 13 **D)** 14 **E)** 15

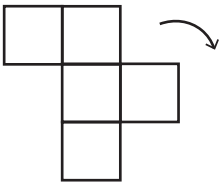
3. In a coach, 5 people got off at consecutive stations.

- Ahmet got off after Veli, before Ali.
- Anıl got off lastly.
- Veli and Mehmet didn't get off at consecutive stations.

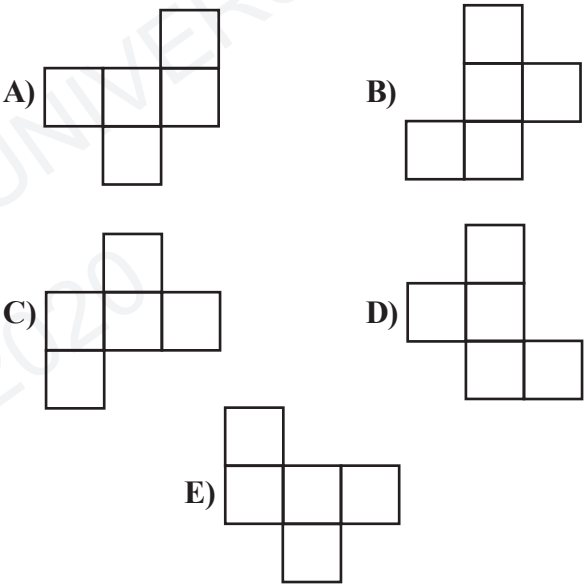
Who may got off at first sitation?

A) Ali **B)** Veli **C)** Anıl **D)** Mehmet **E)** Ahmet

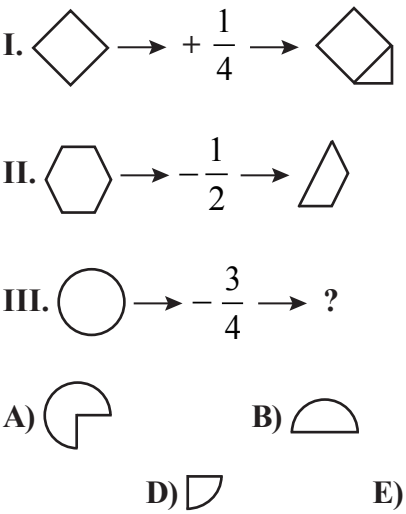
4.



Which one of the following is obtained if the above figure is rotated at an angle of 270° in the direction of arrow?



5. According to the relation below what should be replaced in the question mark (?)?



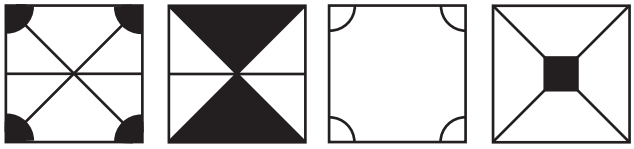
6.

0	2	3	9	30	?	8193

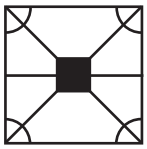
Which one of the following should be replaced in the question mark (?)?

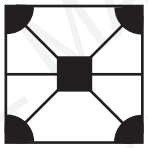
A) 300 **B)** 279 **C)** 273 **D)** 269 **E)** 212

7.



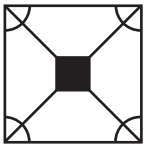
Which one of the following is not possible if any two of above figures superposed?

A) 

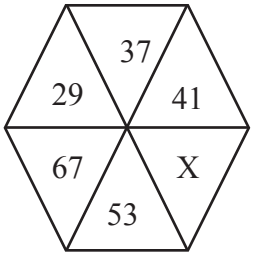
B) 

C) 

D) 

E) 

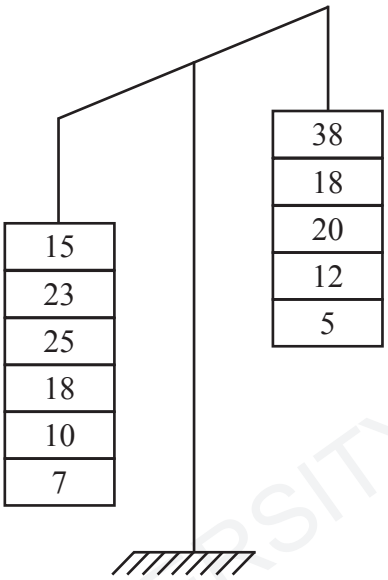
8.



X = ?

A) 4 **B)** 6 **C)** 13 **D)** 25 **E)** 32

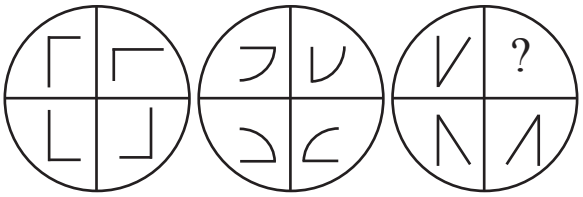
9.



Which one of the following should be deleted to balance the above figure?

A) 15 ; 20 **B)** 25 ; 12 **C)** 10 ; 5 **D)** 15 ; 5 **E)** 23 ; 12

10.



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

A)  **B)**  **C)** 

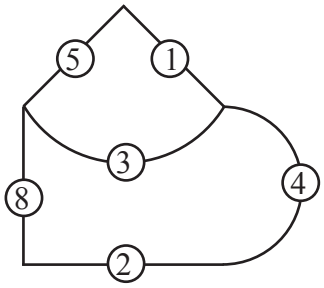
D)  **E)** 

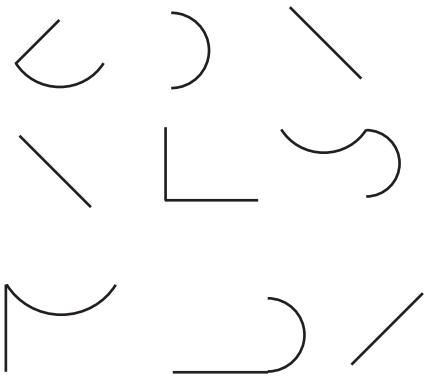
11. **B C E H O Z**

Which one of the following does not obey the rule above?

A) 30 **B)** 33 **C)** 80 **D)** 83 **E)** 96

12.

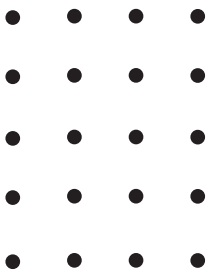




Which one of the following should be replaced in the question mark (?)?

A) 1285 **B)** 1185 **C)** 2425 **D)** 1265 **E)** 2485

13.



How many possible squares are there whose vertices are on the above points?

A) 24 **B)** 22 **C)** 20 **D)** 18 **E)** 16

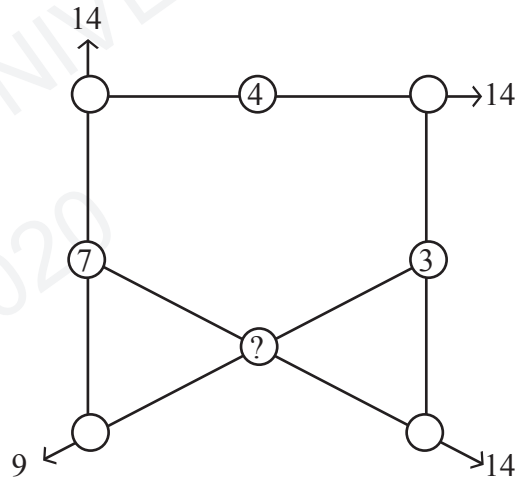
14. Each letter represents a different digit.

$$\begin{array}{r} \text{İ K İ} \\ +\ \text{İ K İ} \\ \hline \text{D Ö R T} \end{array} \qquad \begin{array}{r} \text{D Ö R T} \\ +\ \text{D Ö R T} \\ \hline \text{T K} \square\triangle \end{array} \qquad \square + \triangle = ?$$

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

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

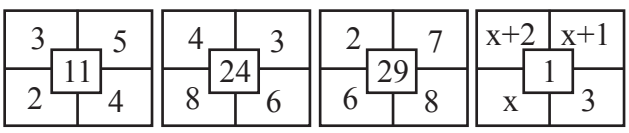
15.



Digits from 1 to 8 are used once in each circle. Which one of the following should be replaced in the question mark (?)?

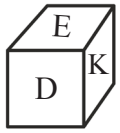
A) 1 **B)** 2 **C)** 5 **D)** 6 **E)** 8

16.

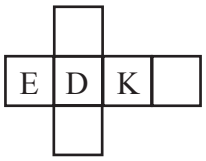


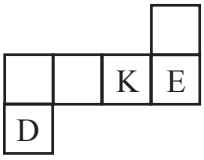
x = ?

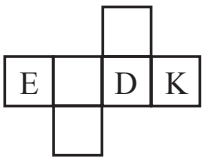
A) -1 **B)** -2 **C)** -3 **D)** -4 **E)** -5

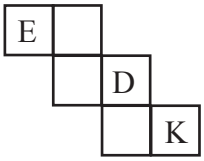
17. 

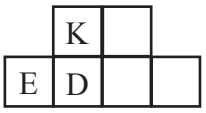
Which one of the following is the open form of the next cube?

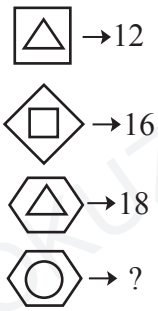
A) 

B) 

C) 

D) 

E) 

18. 

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

A) 0 **B)** 10 **C)** 20 **D)** 22 **E)** 24

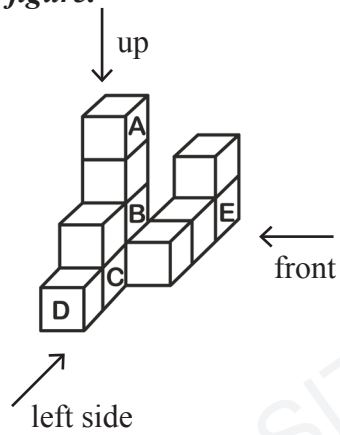
19.

3	5	2		
		1		X
5		3		
	4			
2			5	

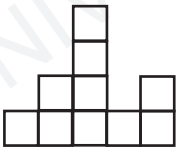
In the above figure the digits 1, 2, 3, 4, 5 appear only once at every row and every column. What should replace X?

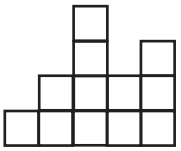
A) 1 **B)** 2 **C)** 3 **D)** 4 **E)** 5

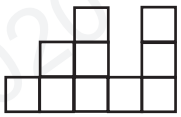
Solve questions 20-22 according to below figure.

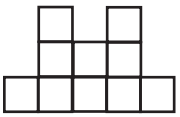


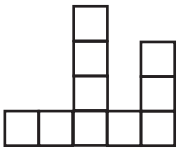
20. Which one of the following is the front appereance of these cubes?

A) 

B) 

C) 

D) 

E) 

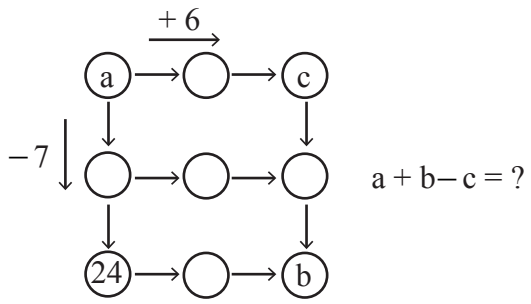
21. How many squares are there if one looks at left side?

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

22. Which one of the cubes with labels should be deleted to change the top view?

A) A **B)** B **C)** C **D)** D **E)** E

23.



a + b − c = ?

A) 20 **B)** 24 **C)** 31 **D)** 84 **E)** 124

24.

1	9	x	2	−	1	+	3	=	2	0	÷	1	+	5
1	2	3	4	5	6	7	8		9	10	11	12	13	14

Which box should be deleted to satisfy the given equality?

A) 1 **B)** 2 **C)** 5 **D)** 7 **E)** 10

25. $1 \quad 1\frac{1}{2} \quad 2\frac{1}{4} \quad 3\frac{3}{8} \quad ? \quad 7\frac{19}{32}$

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

A) $4\frac{3}{16}$ **B)** $4\frac{5}{16}$ **C)** $5\frac{1}{16}$

D) $5\frac{3}{16}$ **E)** $6\frac{3}{16}$

26.

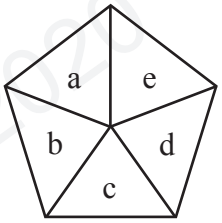
KATIK	⟶	63385
AMADE	⟶	16467
KASIM	⟶	28631
MAKET	⟶	73516
KADET	⟶	?

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

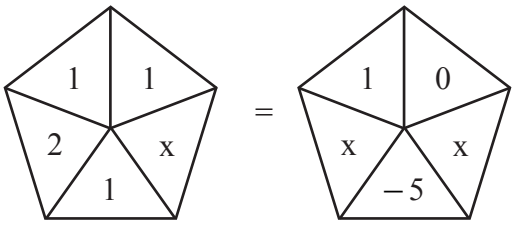
A) 83576 **B)** 47563 **C)** 13568

D) 53142 **E)** 21745

27. $a,b,c,d,e \in \mathbb{R}$,



$= (b.d - c)^{a+e}$

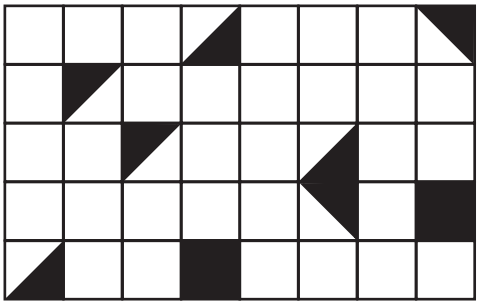


Which one of the following should be x?

A) -2 **B)** $\frac{1}{3}$ **C)** 0

D) $\frac{2}{3}$ **E)** 2

28.

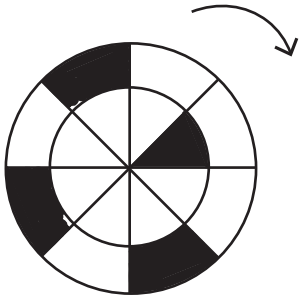


What percentage of the above figure is shaded?

A) 12,5 **B)** 13,25 **C)** 13,75

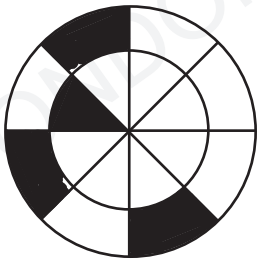
D) 14,5 **E)** 15

29.

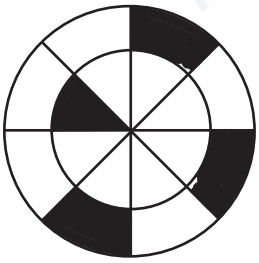


Which one of the following is obtained if the given figure is rotated at angle of 225° in the direction of arrow?

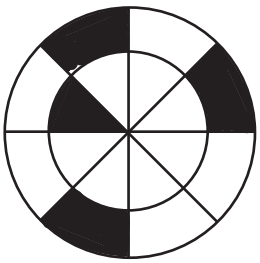
A)



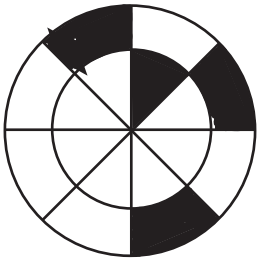
B)



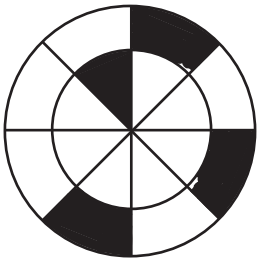
C)



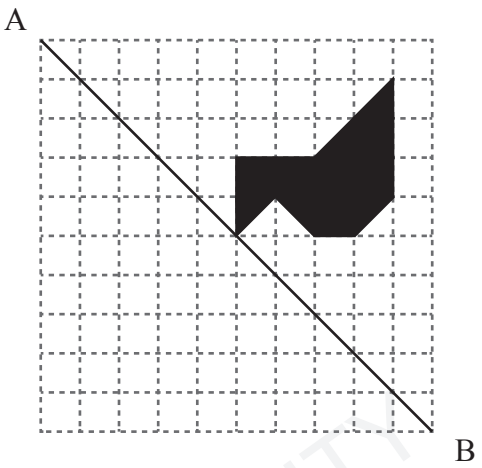
D)



E)



30.



Which one of the following is symmetric of the shaded region with respect to line AB?

A)

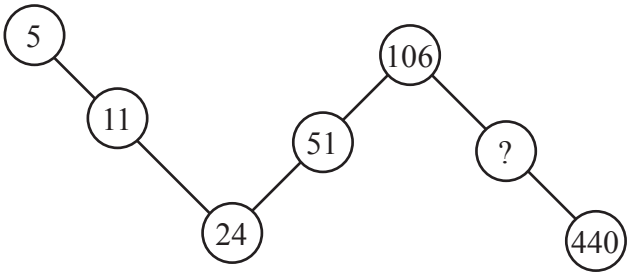
B)

C)

D)

E)

31.



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

A) 137 **B)** 141 **C)** 211

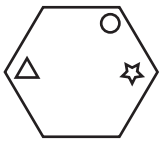
D) 217 **E)** 301

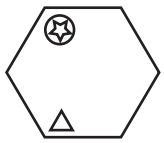
32.

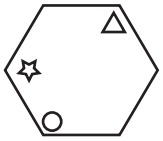
Which one of the following should be replaced in the question mark (?)?

A) 

B) 

C) 

D) 

E) 

33.

392 ⟶ 25
643 ⟶ 21
631 ⟶ 17
346 ⟶ ?

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

A) 6 **B)** 9 **C)** 11 **D)** 13 **E)** 14

34.

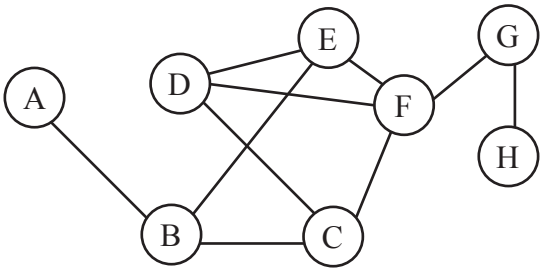


Figure 1

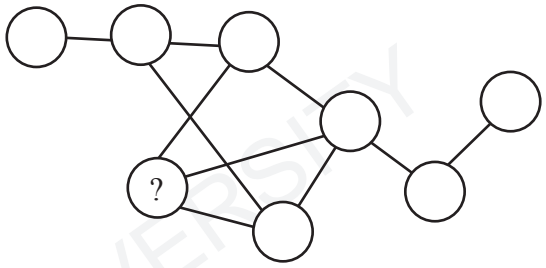
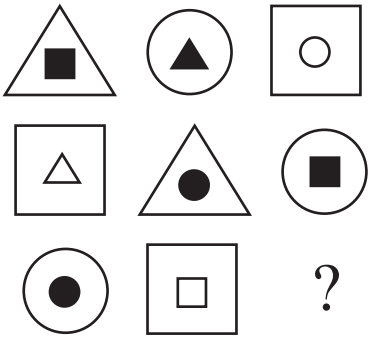


Figure 2

The figure 1 is rearranged without changing linkages and letters and figure 2 is obtained. Which one of the following should be replaced in the question mark (?)?

A) B **B)** C **C)** D **D)** E **E)** F

35.



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

A) 

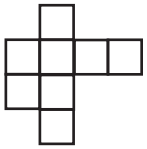
B) 

C) 

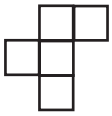
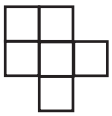
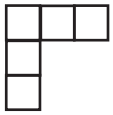
D) 

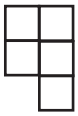
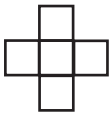
E) 

36.

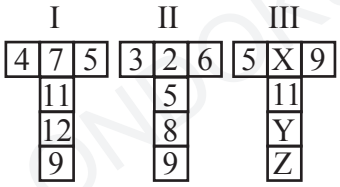


Which one of the following figures is not contained in the above figure?

A)  **B)**  **C)** 

D)  **E)** 

37.

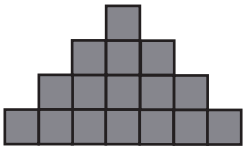


X = ?
Y = ?
Z = ?

A) X = 7, Y = 6, Z = 14 **B)** X = 15, Y = 5, Z = 4 **C)** X = 6, Y = 15, Z = 14

D) X = 6, Y = 8, Z = 4 **E)** X = 7, Y = 8, Z = 15

38.



If the area of each square is 4 unit square, then how many units is the circumference of the figure?

A) 22 **B)** 40 **C)** 44 **D)** 64 **E)** 88

39. Every symbol represents a nonzero number.

$3\square = 4\bullet = 8\triangle = \blacksquare$ ise

$$\frac{\bullet - 2\triangle + 2\blacksquare}{(12.\square.\bullet) : \blacksquare} = ?$$

A) 0 **B)** 1 **C)** 2 **D)** $\blacksquare$ **E)** $2\blacksquare$

40. $\square - \triangle = \bigcirc$

$\bigcirc - \square = \triangle + \pentagon$

$\pentagon : \bigcirc = \triangle$

Each symbol represents a nonzero number.
$\bigcirc$ = ?

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

End of the Examination.

ONDOKUZ MAYIS UNIVERSITY

2020

INTERNATIONAL STUDENT EXAM (OMÜ YÖS)

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 then **30** minutes. Candidates are not allowed to leave the exam room in the first **40** 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, attemps 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 inviligators. 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 shoul 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.