



# UNICUS OLYMPIADS

## Sample Paper

**Class 7**

**Unicus Mathematics Olympiad (UMO)**



Section	Total Questions	Marks per Questions	Total Marks
Classic Section	40	1	40
Scholar Section	10	2	20
<b>Grand Total</b>	<b>50</b>		<b>60</b>

**Classic Section (Each Question is 1 Mark)**

1. In a maths quiz, the scores of a team in the different rounds were 20, -30, -5, 10, 25. What is the total score of the team at the end of all the rounds?

- a. 20  
c. -20
- b. 90  
d. -90
- 

2. Which of the following numbers is completely divisible by 3?

- a. 130497  
c. 100019
- b. 213473  
d. 123049
- 

3. Which of the following 3D objects has 6 vertices, 10 edges and 6 faces?

- a. Cylinder  
c. Pentagonal Pyramid
- b. Triangular Pyramid  
d. Square Pyramid
- 

4. Find the sum of the expression:

$$(-114) + 53 + (-117) + (-24) + 72 + 112$$

- a. -24  
c. -18
- b. 24  
d. 18
- 

5. The temperature at a hill station is  $6^{\circ}\text{C}$  during the day. It becomes  $-7^{\circ}\text{C}$  during mid-night. By how many degrees did the temperature fall?

- a.  $7^{\circ}\text{C}$   
c.  $11^{\circ}\text{C}$
- b.  $9^{\circ}\text{C}$   
d.  $13^{\circ}\text{C}$
- 

6. Simplify:

$$1\frac{2}{5} + 1\frac{4}{15} - 1\frac{4}{5} + 1\frac{7}{10}$$

- a.  $2\frac{11}{30}$   
c.  $2\frac{17}{30}$
- b.  $1\frac{13}{15}$   
d.  $2\frac{7}{15}$
- 

7. The ratio of daily expenses and savings of Rachel is 2: 3. If she spends \$10 per day, then how much money does she save per day?

- a. \$5  
c. \$15
- b. \$10  
d. \$20
-

## Unicus Mathematics Olympiad (UMO)

8. Fill in the blank:

The ratio of 420 mL to 3.2 L is \_\_\_\_\_.

- a. 42: 420  
c. 17: 320

- b. 21: 160  
d. 19: 420
- 

9. Out of a salary of \$45,000, a man keeps aside one-third as his savings. Out of the remaining, he spends 50% on food and 20% on house rent. How much amount did he spend on food and house rent respectively?

- a. \$15,000, \$6,000  
c. \$12,000, \$4,000

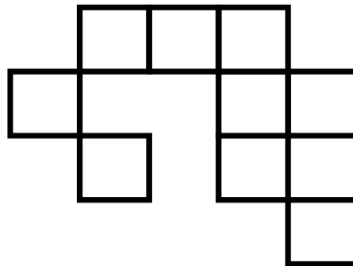
- b. \$6,000, \$15,000  
d. \$4,000, \$12,000
- 

10. Find the area of a square whose perimeter is equal to the perimeter of a rectangle with length 34 cm x 44 cm:

- a. 1521 cm<sup>2</sup>  
c. 2346 cm<sup>2</sup>

- b. 1600 cm<sup>2</sup>  
d. 998 cm<sup>2</sup>
- 

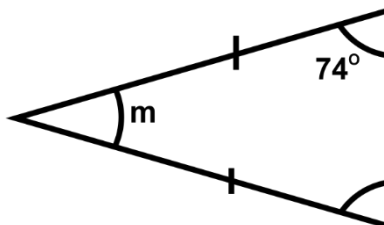
11. The given figure is made up of equal squares. If its perimeter is 442 cm, then find the area of the figure:



- a. 2495 cm<sup>2</sup>  
c. 2364 cm<sup>2</sup>

- b. 1376 cm<sup>2</sup>  
d. 2601 cm<sup>2</sup>
- 

12. The given triangle is an isosceles triangle. Find the value of  $\angle m$ :



- a. 46°  
c. 28°

- b. 32°  
d. 38°
-



## Unicus Mathematics Olympiad (UMO)

18. Find the value of the following:

$$a^2/b^2 + b^2/a^2:$$

- a.  $(a/b + b/a)^2 - 2$   
c.  $(a/b + b/a)^2 + 4$

- b.  $(a/b + b/a)^2 + 2$   
d.  $(a/b + b/a)^2 - 4$
- 

19. Two complementary angles are such that two times the measures of one is equal to three times the measures of the other. The measure of the larger angle is:

- a.  $72^\circ$   
c.  $36^\circ$

- b.  $108^\circ$   
d.  $54^\circ$
- 

20. Leo bought 20 boxes of pens. Each box contained 15 pens. The pens were equally distributed among 25 students. How many pens did each student receive?

- a. 25  
c. 12

- b. 15  
d. 14
- 

21. A cake shop cuts a cake into 6 slices. One slice cost \$35. Which equation would you use to find the cost 'a' of the whole cake?

- a.  $35a = 6$   
c.  $a = 6 \times 35$

- b.  $6a = 35$   
d.  $a = 35/6$
- 

22. Arya sold 50 wristwatches and 30 smart pens. If the cost of 2 wristwatches is \$471.70 and 3 smart pens are \$23.16. What is the total cost of wristwatches and smart pens sold?

- a. \$13,289.25  
c. \$15,843.50

- b. \$16,480.60  
d. \$12,024.10
- 

23. There were 300 pupils in a stadium. 40% of them were boys. 60 more boys entered the stadium. What percentage of the pupils in the stadium are boys now?

- a. 20%  
c. 50%

- b. 30%  
d. 60%
- 

24. Find the value of y:

$$870 \times 5\frac{2}{3} + 4\frac{4}{5} \div 1\frac{3}{5} = y$$

- a. 4933  
c.  $4932\frac{3}{5}$

- b.  $4930\frac{2}{5}$   
d. 4935
-

## Unicus Mathematics Olympiad (UMO)

25. Find the value of the expression:

$$[2 - 1/3] [2 - 3/5] [2 - 5/7] \dots [2 - 997/999]$$

a.  $\frac{1001}{3}$

b.  $\frac{1}{999}$

c. 0

d.  $\frac{1}{3}$

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26. The ratio of the present ages of Sam and Jack is 4: 5. Six years hence, the ratio of their ages will be 14: 17. What will be the ratio their age 12 years hence?

a. 15: 19

b. 13: 15

c. 16: 19

d. 17: 19

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27. When a number is added to another number, the total becomes  $333\frac{1}{3}$  percent of the second number. What is the ratio between the first number and the second number?

a. 3: 7

b. 7: 4

c. 7: 3

d. 4: 7

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28. A dealer buys an old cooler listed at \$950 and gets a discount of 10%. He spends \$45 for its repair. If he sells the cooler at a profit of 25%, then the selling price of the cooler is:

a. \$1,125

b. \$1,215

c. \$1,251

d. \$1,512

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29. If  $x = -3$ , then what is the value of  $x^4 - x^3 - x^2 + 3$ ?

a. 45

b. 75

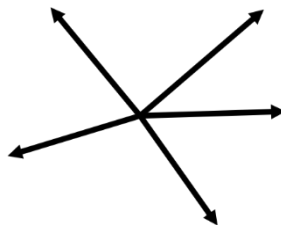
c. 102

d. 111

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30. Fill in the blank:

Number of angles formed in the given figure is \_\_\_\_\_.



a. 2

b. 5

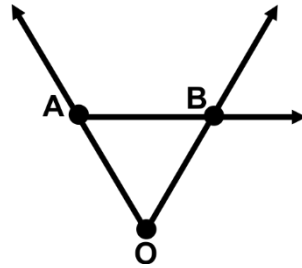
c. 4

d. More than 5

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**Unicus Mathematics Olympiad (UMO)**

31. Which of the following does not represent a ray in the given figure?



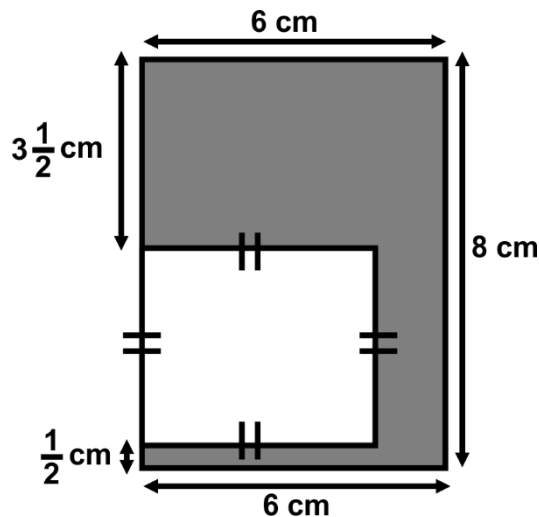
- a. OA
- b. OB
- c. BA
- d. AB

32. The following pictograph shows favourite ice cream flavours of boys in a colony. Which flavour is liked least by the boys?

Flavours	No. of Boys
Vanilla	
Mango	
Strawberry	
Butterscotch	
Each  represents 100 boys.	

- a. Mango
- b. Vanilla
- c. Strawberry
- d. Butterscotch

33. What is the area of the shaded part in the figure given below?







## Scholar Section (Each Question is 2 Marks)

41. Following is a list of numbers. If 2 is subtracted from the middle digit of each of these numbers and the digits in the units place and hundreds place interchange their positions in each of these numbers which number will take the middle position after they are arranged in descending order?

632 175 469 942 845

- a. 216  
c. 551
- b. 229  
d. 528

42. If the angles of the quadrilateral are in the ratio of 2 : 3 : 4 : 6, then find the measure of each of the angles:

- a.  $48^\circ, 72^\circ, 96^\circ, 144^\circ$   
c.  $103^\circ, 88^\circ, 94^\circ, 75^\circ$
- b.  $128^\circ, 98^\circ, 78^\circ, 56^\circ$   
d.  $101^\circ, 93^\circ, 56^\circ, 110^\circ$

43. Match column A with column B:

Column A		Column B	
a.	( $\frac{1}{2} + \frac{1}{3}$ ) of 6	p.	( $\frac{3}{4} - \frac{1}{3}$ ) of 12
b.	( $\frac{1}{3} + \frac{1}{6}$ ) of 18	q.	( $\frac{5}{2} - \frac{2}{3}$ ) of 6
c.	( $\frac{1}{4} + \frac{1}{3}$ ) of 12	r.	( $\frac{5}{4} - \frac{1}{2}$ ) of 12
d.	( $\frac{1}{5} + \frac{1}{6}$ ) of 30	s.	( $\frac{3}{4} - \frac{1}{6}$ ) of 12

- a. (a) - q, (b) - r, (c) - s, (d) - p  
c. (a) - p, (b) - r, (c) - q, (d) - s
- b. (a) - p, (b) - q, (c) - s, (d) - r  
d. (a) - p, (b) - r, (c) - s, (d) - q

44. The ratio of the number of red balls to the number of green balls is 5: 6. The green balls are either light or dark green and their ratio is 4: 2. If there are 12 dark green balls, then find the number of light green and red balls respectively:

- a. 36, 54  
c. 24, 30
- b. 32, 48  
d. 20, 28

45. In a five-digit number, the digit at the hundred's place is 2 and the digit at the one's place is twice the digit at the hundred's place. The number has no thousands. The digit at the ten thousand's place is the sum of the digit at the hundred's place and the digit at the ones place. The digit at the ten's place is the digit at the ten-thousands place minus 1. The number is:

- a. 52064  
c. 60245
- b. 60254  
d. 62054



## Answer Key

1.	a	2.	a	3.	c	4.	c	5.	d	6.	c	7.	c
8.	b	9.	a	10.	a	11.	d	12.	b	13.	c	14.	b
15.	a	16.	a	17.	d	18.	a	19.	d	20.	c	21.	c
22.	d	23.	c	24.	a	25.	a	26.	c	27.	c	28.	a
29.	c	30.	d	31.	c	32.	a	33.	c	34.	d	35.	c
36.	b	37.	a	38.	b	39.	a	40.	c	41.	d	42.	a
43.	d	44.	c	45.	b	46.	c	47.	a	48.	c	49.	c
50.	b												