



Unified International  
Mathematics Olympiad

**UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD (UPDATED)**

**CLASS - 6**  
**Question Paper Code : UM9279**

**KEY**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
C	C	B	A	D	B	A	C	A	B
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
C	C	B	D	A	C	A	B	D	B
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
A	A	D	B	B	D	C	C	D	C
<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
A,B,C	A,B,C,D	A,B,D	A,D	A,B,C	B	Delete	D	D	D
<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
A	Delete	D	A	B	A	C	A	C	D

**EXPLANATIONS**

**MATHEMATICS - 1**

1. (C)  $a^2b^2 - b^2c^2 + c^2a^2 = 0^2 \times 2^2 - 2^2 \times 1^2 + 1^2 \times 0^2$   
 $= 0 - 4 + 0 = -4$

2. (C) In isosceles triangle has one line symmetry

3. (B) Given  $\frac{1}{5} : \frac{1}{x} = \frac{1}{x} : \frac{1}{0.45}$

$$\therefore \frac{1}{x} \times \frac{1}{x} = \frac{1}{5} \times \frac{1}{0.45}$$

$$\frac{1}{x^2} = \frac{1}{2.25}$$

$$\therefore x^2 = 2.25$$

$$x^2 = (1.5)^2$$

$$x = 1.5$$

4. (A) Given expression is  $40 - 6a$

5. (D)  $1835 + 60 = 1895$

$$1895 + 60 = 1955$$

$$1955 + 60 = 2015$$

$$2015 + 60 = 2075$$

$$6. (B) \text{ Length} = \frac{\text{Area}}{\text{breadth}} = \frac{80 \text{ m}^2}{\left(\frac{16}{3}\right) \text{ m}}$$

$$\cancel{80}^5 \text{ m}^2 \times \frac{3}{\cancel{16} \text{ m}} = 15 \text{ m}$$

$$\text{Perimeter} = 2(l + b) = 2\left(15 + \frac{16}{3}\right) \text{ m}$$

$$= 2\left(\frac{45 + 16}{3}\right) \text{ m} = \frac{2 \times 61}{3} = \frac{122}{3} \text{ m}$$

$$= 40\frac{2}{3} \text{ m}$$

$$7. (A) \text{ Yellow roses} = \left(1 - \frac{1}{7} - \frac{3}{4}\right) \times 476$$

$$= \left(\frac{28 - 4 - 21}{28}\right) 476 = \left(\frac{3}{\cancel{28}_1}\right) \cancel{476}^{17}$$

$$= 51$$

$$8. (C) \text{ LHS} = 144 - \frac{\cancel{1024}^{32}}{\cancel{32}} \times 79 + 123$$

$$= 144 - 2528 + 123$$

$$= -2261$$

9. (A) In a rectangle each angle is  $90^\circ$   
Sum of four angles of a rectangle  
 $= 4 \times 90 = 360^\circ$

$$10. (B) \text{ Given } 2x + 5x + 7x = 280$$

$$14x = 280$$

$$x = \frac{280}{14}$$

$$x = 20$$

Difference of marbles between Hasan and Krish

$$= 7x - 5x$$

$$= 2x = 2 \times 20$$

$$= 40$$

$$11. (C) \text{ Total sweets having three children} = 2 \times 13 = 26$$

$$\text{Number of sweets of Anu} = 32 - 26 = 6$$

12. (C) Given Chitra's having marbles = Ganesh's marbles 210 marbles

Given Ganesh having marbles + 35 marbles = 98 marbles

$$\therefore \text{Ganesh having marbles} = 98 \text{ marbles} - 35 \text{ marbles} = 63 \text{ marbles}$$

$$\therefore \text{Chitra's having marbles} = 63 \text{ marbles} + 210 \text{ marbles} = 273 \text{ marbles}$$

Total marbles =  $(273 + 63)$  marbles = 336 marbles

13. (B) Option 'A' 11 is a factor of 451 other than 1 and 451

$$\therefore 451 \text{ is not a factor}$$

Option 'B' except 1 and 479 there are no other factors

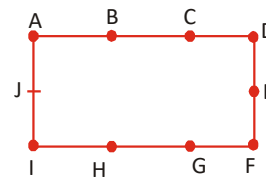
$$\therefore 479 \text{ is a prime}$$

Option 'C' 19 and 23 are the factors of 437 other than 1 and 437

Option 'D' 7 and 67 are factors of 469 other than 1 and 469

$$\therefore 469 \text{ is a composite number.}$$

14. (D)



Total 10 poles required

$$15. (A) \text{ LHS} = \frac{13}{4} - \frac{\cancel{4}^2}{\cancel{3}} \times \frac{\cancel{3}}{\cancel{3}_3}$$

$$= \frac{13}{3} \times 5 - \left(\frac{3}{10} + \frac{106}{5}\right)$$

$$= \frac{\left(\frac{39 - 8}{12}\right)}{\frac{65}{3} - \left(\frac{3 + 212}{10}\right)}$$

$$= \frac{\frac{31}{12}}{\left(\frac{650 - 645}{30}\right)}$$

$$= \frac{\left(\frac{31}{12}\right)}{\left(\frac{5}{30_6}\right)}$$

$$= \frac{31}{\cancel{12}_2} \times \cancel{6}$$

$$= \frac{31}{2}$$

$$\therefore \frac{31}{2} - \frac{1}{2} = \frac{30}{2} = 15 \text{ is an integer.}$$

16. (C) LM = 2 LO = 2 NO

17. (A) 99999999 - 100000 = 99899999

$$18. (B) \text{ LHS} = \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5}$$

$$+ \frac{1}{5 \times 6} + \frac{1}{6 \times 7} + \frac{1}{7 \times 8}$$

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

$$+ \left(\frac{1}{5} - \frac{1}{6}\right) + \left(\frac{1}{6} - \frac{1}{7}\right) + \left(\frac{1}{7} - \frac{1}{8}\right)$$

$$= 1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \frac{1}{4} - \frac{1}{5}$$

$$+ \frac{1}{5} - \frac{1}{6} + \frac{1}{6} - \frac{1}{7} + \frac{1}{7} - \frac{1}{8}$$

$$= 1 - \frac{1}{8}$$

$$= \left(\frac{8-1}{8}\right)$$

$$= \left(\frac{7}{8}\right)$$

19. (D) Multiplication of whole numbers satisfy closure, associative and commutative properties

20. (B) Required ratio = 4 : 2 = 2 : 1

21. (A) A parallelogram has 'no' line symmetry

22. (A) 6144 < 6344 < 6411

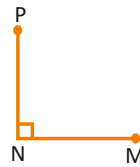
$$23. (D) -\frac{5}{6} = -0.83, -\frac{3}{4} = -0.75, -\frac{7}{12} = -0.58$$

$$-\frac{4}{5} = -0.8, -\frac{2}{3} = -0.66$$

$$\therefore -0.83 < -0.8 < -0.75 < -0.66 < -0.58$$

$$-\frac{5}{6} < -\frac{4}{5} < -\frac{3}{4} < -\frac{2}{3} < -\frac{7}{12}$$

24. (B) Rule followed "Subtract 10, then divide the result by 2"



25. (B)

MN ⊥ NP

26. (D) Given the ratio of A & B = 1 $\frac{1}{4}$  : 1 $\frac{2}{3}$  =  $\frac{5}{4}$  :  $\frac{5}{3}$

$$= \frac{5}{4} \times 12 : \frac{5}{3} \times 12$$

$$= \cancel{15}^3 : \cancel{20}^4$$

$$= 3 : 4$$

$$= 3x : 4x$$

$$\text{Given } 3x = ₹360$$

$$x = \frac{₹360}{3} = ₹120$$

$$\therefore \text{Total money} = 3x + 4x = 7x = 7 \times ₹120 = ₹840$$

$$27. (C) \text{ LHS} = \left(2 \times \frac{22}{7} \times \frac{3.5}{2}\right) \times \frac{3.5}{2} + \left(\frac{22}{7} \times \frac{3.5}{2} \times 3.6\right)$$

$$= \frac{\cancel{22}^{11}}{\cancel{7}_2} \times \frac{\cancel{3.5}^1}{\cancel{2}} \left(2 \times \frac{3.5}{\cancel{2}} + 3.6\right)$$

$$= \frac{11}{2} \times 7.1 = \frac{78.1}{2} = 39.05$$

28. (C) Given original length and breadth be  $l$  &  $b$  respectively

$\therefore$  Original area =  $l \times b$

Given  $L = 2l$  &  $B = 2b$

New area =  $LB = 2l \times 2b = 4 \times lb$

New area = 4 times to original area.

29. (D) There are 7 numerals in Roman numeration system.

30. (C)

$$\text{LHS} = \left(2 - \frac{1}{2}\right) \left(2 - \frac{2}{3}\right) \left(2 - \frac{3}{4}\right) \dots \times \left(2 - \frac{2020}{2021}\right)$$

$$= \left(\frac{4-1}{2}\right) \left(\frac{6-2}{3}\right) \left(\frac{8-3}{4}\right) \dots \left(\frac{4042-2020}{2021}\right)$$

$$= \frac{\cancel{2}}{2} \times \frac{\cancel{4}}{\cancel{2}} \times \frac{\cancel{3}}{\cancel{3}} \times \frac{\cancel{4}}{\cancel{4}} \times \dots \times \frac{2022}{2021}$$

$$= \frac{2022}{2}$$

$$= 1011$$

### MATHEMATICS - 2

31. (A,B,C)

Options A,B & C are closed figure.

32. (A,B,C,D)

All statement are true about 1.

33. (A,B,D)

Options A, B & D are false but option 'B'

"A line segment has definite length" is true.

34. (A,D)

Librarian has either 56 books (or) 112 books

35. (A,B,C)

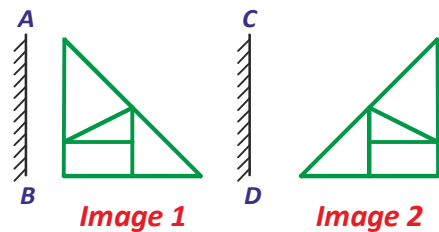
The difference of two integers is also an integer. Hence closure property of subtraction satisfy addition, subtraction and multiplication.

### REASONING

36. (B)

	A	B	C
Hill Stations	X	✓	X
Historical Places	X	X	✓
Industries	✓	X	X

37. (Delete)



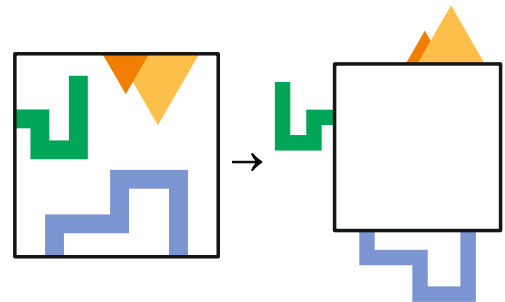
38. (D)

39. (D) The arrangement is Thus bus B is to left side of bus C.



Hence Option D is correct.

40. (D)



41. (A)  $2 \times \& = 24$  ,  $2 \times @ = 18$  and  $\# = 21$

So,  $24 + 18 - 21 = 3 + 18 = 21$

42. (Delete)

43. (D) The given sequence has alphabets that occur at even places. Vowels A, E, I, O, U occur at 1st, 5th, 9th, 15th and 21st places. We see that no vowel comes at an even place. Hence, it is not possible.

44. (A)

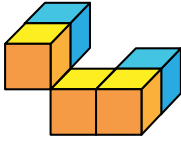
45. (B)

### CRITICAL THINKING

46. (A)



47. (C)



48. (A) A

Distance between center pole and childrens is more in A compare with B. So, in picture A the children turns fast.

49. (C) Immediately take the child to hospital

50. (D) 2, 3, 1, 5, 4

Rain → Sun → Rainbow → Child → Happy