

Class: 7
Subject: Mathematics
Topic: OASK1507SA201
No. of Questions: 36

Time: 3 Hrs.

M.M. 70

General Instructions:

1. All questions are compulsory.
2. The question paper consists of 37 questions and it is divided into three sections A, B, C, D and E.
3. Section A comprises of 15 question carrying 1 mark each.
4. Section B comprises of 8 questions carrying 2 marks each.
5. Section C comprises of 6 questions carrying 3 marks each.
6. Section D comprises of 4 questions carrying 4 marks each.
7. Section E comprises of 3 questions carrying 5 marks each.

SECTION - A

Q1. $8x^3 \times 2x^5 =$

- (a) $10x^8$
- (b) $16x^8$
- (c) $16x^{15}$
- (d) $6x^2$

Sol. (b)
 $8x^3 \times 2x^5 = 16x^8$
 $8x^3 \times 2x^5 = 8 \times 2 \times x^{3+5}$
 $= 16x^8$

Q2. Which of the following are the measures of the angles of a triangle?

- (a) $113^\circ, 27^\circ, 50^\circ$
- (b) $92^\circ, 45^\circ, 48^\circ$
- (c) $80^\circ, 49^\circ, 51^\circ$
- (d) $100^\circ, 49^\circ, 40^\circ$

Sol. (c)

The sum of the measures of the three angles of a triangle is always 180° .
This condition is satisfied by option, C from the given options.

- Q3. The simple interest on loan of Rs. 3600 at 15% for 2 years =
(a) Rs. 1600
(b) Rs. 2700
(c) Rs. 1080
(d) Rs. 108

Sol. (c)
The formula to find simple interest is , $I = \frac{PRT}{100}$
Here, P = Rs. 3600, R = 15% N = 2 years
 \therefore The simple interest = $\frac{PRN}{100}$
 $= \text{Rs.} \left(\frac{3600 \times 15 \times 2}{100} \right)$
 $= \text{Rs.} \left(\frac{36 \times 100 \times 15 \times 2}{100} \right)$
 $= \text{Rs.} (1080)$

Hence the simple interest on Rs. 3600 at 15% for 2 years =Rs. 1080

- Q4. $m - \{m + [2m - (-m)] - m\}$
(a) $(-2m^2)$
(b) $(-4m)$
(c) 2 cm
(d) $(-2 m)$

Sol. (d)
 $m - \{m + [2m - (-m)] - m\}$
 $= m - \{m + [2m - (-m)] - m\}$
 $= m - \{m + [2m + m] - m\}$
 $= m - \{m + 3m - m\}$
 $= m - \{3m\}$
 $= (-2m)$

- Q5. The length of a cube with volume of a cube volume 64 cm^3 is
- (a) 8 cm
 - (b) 4 cm^3
 - (c) 4 cm
 - (d) 16 cm

Sol. (c)
The formula to find volume of cube = Length \times length \times length
Volume of given cube = 64 cm^3
Hence, 64 cm^3
 $= (4 \times 4 \times 4) \text{ cm}^3$
 $\therefore 64 \text{ cm}^3 = (4 \text{ cm})^3$
 \therefore Length of given cube = 4 cm

- Q6. Find the value of the 'a' in the expression $3a + 3 = 9$
- (a) 6
 - (b) 2
 - (c) 14
 - (d) 4

Sol. (b)
 $3a + 3 = 9$
 $3a + 3 - 3 = 9 - 3$ (Subtracting 3 from both the sides of equation)
 $\therefore 3a = 6$
 $\frac{3a}{3} = \frac{6}{3}$ (Dividing both the sides of equation by 3)
 $\therefore a = 2$

- Q7. The formula to find simple interest is given by
- (a) $\text{PRN} / 100$
 - (b) $100 / \text{PRN}$
 - (c) $\text{PRN} \times 100$
 - (d) $\text{PR} / 100$

Sol. (a)
Formula to find simple interest = $\text{PRN} / 100$

Q8. Which of the followings has both horizontal as well as vertical line of symmetry?

- (a) A
- (b) B
- (c) I
- (d) U

Sol: (c)

I have both horizontal and vertical symmetry

Q9. Simplify $6a^2 \div (3^2)^4$

Sol. $6a^2 \div (3^2)^4$

$$\begin{aligned} &= 6 \times a^2 \div 3^{2 \times 4} \\ &= 6 \times a^2 \div 3^8 \\ &= \frac{6 \times a^2}{3^8} = \frac{3^1 \times 2 \times a^2}{3^8} \\ &= 3^{1-8} \times 2 \times a^2 \\ &= 3^{-7} \times 2a^2 = \frac{2a^2}{3^7} \end{aligned}$$

Q10. Evaluate: $19 - [30 - \{-12 + (8-3)\}]$

Sol. $19 - [30 - \{-12 + (8-3)\}]$

$$\begin{aligned} &= 19 - [30 - \{-12 + 5\}] \\ &= 19 - [30 - \{-7\}] \\ &= 19 - [30 + 7] \\ &= 19 - 37 \\ &= (-18) \end{aligned}$$

Q11. Convert 9 litres into cubic cm.

Sol. 1 litre = 1000 ml = 1000 cm³

9 litres = 9000 ml = 9000 cm³

Hence, 9 litres = 9000 cm³

Q12. Find the value of $\frac{x^3 \times x^5}{x^4}$ for x = 2

Sol. $\frac{x^3 \times x^5}{x^4} = \frac{x^{3+5}}{x^4}$

$$= \frac{x^8}{x^4} = x^{8-4}$$

$$= x^4, \text{ for } x = 2,$$

$$x^2 = 2^4 = 16 \quad (\text{Substituting } x = 2)$$

Q13. Stat the formula to find the volume of a cuboid.

Sol. Volume of a cuboid = length × breadth × height

Q14. Evaluate: $(a^2bc^3)^4$

Sol. $(a^2bc^3)^4$

$$= (a^2)^4 (b)^4 (c^3)^4$$

$$= a^{2 \times 4} b^4 c^{3 \times 4}$$

$$= a^8 b^4 c^{12}$$

Q15. Solve the equation: $5m - 6 = 4$

Sol. $5m - 6 = 4$

$$5m - 6 + 6 = 4 + 6 \quad (\text{Adding 6 to both sides of the equation})$$

$$\therefore 5m = 10$$

$$\therefore \frac{5m}{5} = \frac{10}{5} \quad (\text{Dividing both sides of the equation by 5})$$

$$\therefore m = 2$$

SECTION – B

Q16. Solve the equation: $\frac{5}{a} + a - \frac{2}{3} = 6$

Sol. $\frac{5}{a} + a - \frac{2}{3} = 6$

$$\therefore \frac{5}{a} + 5 - \frac{2}{3} - 5 = 6 - 5 \quad (\text{Subtracting 5 from both sides of the equation})$$

$$\therefore \frac{5}{a} - \frac{2}{3} + \frac{2}{3} = 1 + \frac{2}{3} \quad (\text{Adding } 2/3 \text{ to both sides of the equation})$$

$$\therefore \frac{5}{a} = \frac{5}{3}$$

$$\therefore a = 3$$

Q17. Aman deposits Rs. 15,000 in the bank for 1 year at the rate of 10%. Find the extra amount which he will get at the end of the year.

Sol. Formula to find simple interest = $\frac{PRN}{100}$

Here principal = Rs. 15,000

Rate of interest = 10%

Term = 1 year

$$\begin{aligned} I &= \frac{PRN}{100} = \text{Rs.} \left(\frac{15000 \times 10 \times 1}{100} \right) \\ &= \text{Rs.} \left(\frac{150 \times 100 \times 10 \times 1}{100} \right) \\ &= \text{Rs. } 1500 \end{aligned}$$

Hence, Aman will get Rs. 1500 more at the end of the year.

Q18. $(7x - 4) = (-14)$

Sol. $\therefore 7x - 4 = (-14)$

$\therefore 7x - 4 + 4 = (-14) + 4$ (Adding 4 to both sides of the equation)

$\therefore 7x = (-10)$

$\therefore \frac{7x}{7} = \frac{(-10)}{7}$ (Dividing both sides of the equation by 7)

$x = -\frac{10}{7}$

Q19. Simplify : $5a + [3b - \{4a - (2a - 3b)\} + 2a]$

Sol. $5a + [3b - \{4a - (2a - 3b)\} + 2a]$

$= 5a + [3b - \{4a - 2a + 3b\} + 2a]$

$= 5a + 3b - 4a + 2a - 3b + 2a$

$= 5a - 4a + 2a + 2a + 3b - 3b$

$= 5a - 4a + 4a$

$= 5a$

Q20. If length of a cube is 30 cm, find the volume of the cube.

Sol. Length of the cube = 30 cm

Volume of the cube = length \times length \times length

$= 30 \text{ cm} \times 30 \text{ cm} \times 30 \text{ cm}$

$= 2700 \text{ cm}^3$

Hence, volume of the cube = 2700 cm^3

Q21. Solve the equation: $\frac{3}{x} - 6 = (-3)$

Sol. $\frac{3}{x} - 6 = (-3)$

$$\therefore \frac{3}{x} - 6 + 6 = -3 + 6$$

$$\therefore \frac{3}{x} = 3$$

$$\therefore \frac{3}{x} \times x = 3 \times x \quad (\text{Multiply both sides of the equation by } x)$$

$$\therefore 3 = 3x$$

$$\therefore x = 1$$

Q22. Evaluate: $(5^3 \times 5^5) \div (5^{-2})^3$

Sol. $(5^3 \times 5^5) \div (5^{-2})^3$

$$= (5^{3+5}) \div 5^{-6}$$

$$= 5^{8-(-6)}$$

$$= 5^{8+6}$$

$$= 5^{14}$$

$$= 5^{14}$$

Q23. Simplify: $(4^2 \times 3)^3 \div (4 \times 2^3)$

Sol. $(4^2 \times 3)^3 \div (4 \times 2^3)$

$$\therefore (4^2)^3 \times (3)^3 \div (4 \times 2^3)$$

$$\therefore 4^6 \times 3^3 \div (2^2 \times 2^3)$$

$$\therefore (2^2)^6 \times 3^3 \div (2^{2+3})$$

$$= 2^{12-5} 3^3$$

$$= 2^7 3^3$$

SECTION - C

Q24. What will be the rate of interest if an interest of Rs. 1323 is earned on Rs. 4200 for 3.5 years?

Sol. Formula to find simple interest = $\frac{PRN}{100}$

Here principal = Rs. 4200

Term N = 3.5 years

Interest = Rs. 1323

Rate of interest = ?

$$I = \frac{PRN}{100}$$

$$R = \frac{I \times 100}{PN}$$

$$\therefore R = \frac{1323 \times 100}{4200 \times 3.5}$$

$$\therefore R = \frac{1323 \times 100 \times 10}{42 \times 100 \times 35}$$

$$\therefore R = \frac{13230}{1470}$$

$$\therefore R = 9$$

Hence, the rate of interest earned will be 9%

Q25. Solve the equation: $(3a - 3) = 6$

Sol. $(3a - 3) = 6$

$$\therefore 3a - 3 + 3 = 6 + 3$$

$$\therefore 3a = 9$$

$$\therefore \frac{3a}{3} = \frac{9}{3}$$

$$\therefore a = 3$$

Q26. Simplify: $(3a^2 - 4b - 5) - (2a^2 - 2b - 3)$

Sol. $(3a^2 - 4b - 5) - (2a^2 - 2b - 3)$
 $= 3a^2 - 4b - 5 - 2a^2 + 2b + 3$
 $= 3a^2 - 2a^2 - 4b + 2b - 5 + 3$
 $a^2 - 2b - 2$

Q27. Find the consecutive numbers having the sum of 7.

Sol. Let x be the smaller number.
The next consecutive number would be x + 1.
Hence, sum of the two consecutive numbers would be x + x + 1
But sum of the two consecutive numbers = 7(Given)
 $\therefore x + x + 1 = 7$
 $\therefore 2x + 1 = 7$
 $\therefore 2x + 1 - 1 = 7 - 1$
 $\therefore 2x = 6$
 $\therefore \frac{2x}{2} = \frac{6}{2}$ (Dividing both the sides of the equation by 2)
 $\therefore x = 3$
3 is the smaller number.
 $x + 1 = 3 + 1 = 4$ is the next consecutive number.

Q28. A field is in the shape of parallelogram with base 260 cm and the corresponding height is 130 cm. Find the cost of cultivating it at the rate of 75 paisa per area

Sol: Rs. 253
Using formula calculate the area ; Cost = Area * Rate

Q29. Ganesh lends Rs. 47000 to his partner Mohan for 1 year and six months at the rate of 9%. Find the amount he would receive from Mohan at the end of the term.

Sol. P = Rs. 47000
R = 9% , N = 1, I = ? , A = ?
 $I = \frac{PRN}{100}$

$$\therefore I = \frac{47000 \times 9 \times 1}{100}$$

$$\therefore I = \text{Rs. } (4230)$$

Amount = Principal + Interest

Amount = Rs. (47000 + 4230) = Rs. 51230

Hence, Ganesh will receive Rs. 51230 from Mohan at the end of the term.

SECTION - D

Q30. In a health club, number of women members is 180 more than the number of man. The number of children is 80 more than men. If total members are 752, find the number of men, women and children members of the club.

Sol. Let the number of member who are men be x

Number of women members is 180 more than number of men members.

\therefore Number of women members is $x + 180$

Number of children members is 80 more than the number of men.

\therefore Number of children members = $x + 80$

Total number of members = 752(Given)

$$\therefore x + x + 180 + x + 80 = 752$$

$$\therefore 3x + 260 = 752$$

$$\therefore 3x = 752 - 260$$

$$\therefore 3x = 492$$

$$\frac{3x}{3} = \frac{492}{3} \quad (\text{Dividing both the sides of equation by 3})$$

$$\therefore x = 164$$

Hence, number of men members = $x = 164$

Hence, number of women members = $x + 180 = 164 + 180 = 344$

Hence, number of children members = $x + 80 = 164 + 80 = 244$

Hence, number of children members = $x + 80 = 164 + 80 = 244$

Q31. Solve: $\frac{3a}{4} + 6 = 3$

Sol. $\frac{3a}{4} + 6 = 3$

$$\therefore \frac{3a}{4} + 6 - 6 = 3 - 6$$

$$\therefore \frac{3a}{4} = -3$$

$$\therefore \frac{3a}{4} \times 4 = -3 \times 4$$

$$\therefore \frac{3a}{3} = \frac{-12}{3}$$

$$\therefore a = -4$$

Q32. Solve: $3x + 3 - (-4x) - 8x + (-9) + x - (4x) = 6$

Sol. $3x + 3 - (-4x) - 8x + (-9) + x - (4x) = 6$

$$3x + 3 + 4x - 8x - 9 + x + 4x = 6$$

$$3x + 4x - 8x + x + 4x + 3 - 9 = 6$$

$$12x - 8x - 6 = 6$$

$$4x - 6 + 6 = 6 + 6 \quad (\text{Adding 6 to both sides of the equation})$$

$$4x = 12$$

$$\therefore x = 3 \quad (\text{Dividing both sides of the equation by 3})$$

Q33. Find the principal Disha should deposit with the bank at the rate of 7.5% simple interest for two and half years so that she receives interest of Rs. 1500 at the end of the period.

Sol. The given information is :

$$R = 7.5\%$$

$$N = 2.5$$

$$I = \text{Rs. } 1500$$

$$I = \frac{PRN}{100}$$

$$\therefore P = \frac{100 \times I}{R \times N}$$

$$= \frac{100 \times 1500}{7.5 \times 2.5}$$

$$= \frac{100 \times 1500 \times 10 \times 10}{75 \times 25}$$

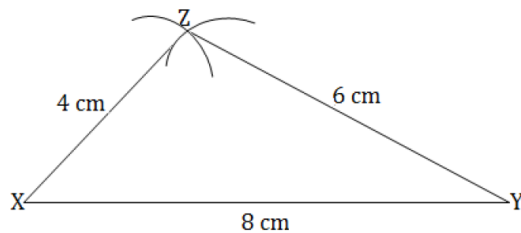
$$\therefore P = \text{Rs. } 8000$$

The principal Disha should deposit with the bank is Rs. 8000

SECTION - E

Q34. Construct a ΔXYZ such that $XY = 8$ cm, $XZ = 4$ cm, $YZ = 6$ cm. Write also the steps of construction.

Sol. $XY = 8$ cm, $XZ = 4$ cm, $YZ = 6$ cm. Write the steps of construction.



Steps for construction of the given triangle:

- Draw \overline{XY} of length 8 cm.
- Draw an arc of circle with centre X and radius 4 cm.
- Draw an arc of circle with centre Y and radius 6 cm and let it intersect the arc with center X.
- Name the point of intersection Z.
- Join Y and Z to draw \overline{YZ}
- Join X and Z to draw \overline{XZ}
- ΔXYZ is the required triangle.

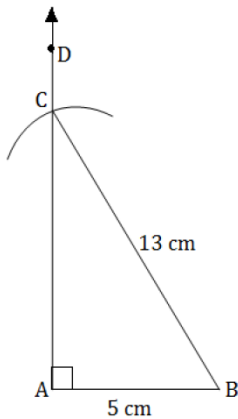
Q35. Construct a ΔABC having Hypotenuse $BC = 13$ cm, $AB = 5$ cm. Write the steps of construction.

Sol. From the given information it is deduced that the triangle which is to be constructed is a right angled triangle.

Hypotenuse $BC = 13$ cm(Given)

$AB = 5$ cm(Given)

$m \angle BAD = 90^\circ$



Steps for construction of the given triangle:

- (a) Draw \overline{AB} of length 5 cm.
- (b) Using set – square, Draw \overline{AD} such that $m \angle BAC = 90^\circ$
- (c) Draw an arc of circle with centre B and radius 13 cm and let it intersect \overline{AD} .
- (d) Name the point of intersection C.
- (e) Draw \overline{BC} .
- (f) $\triangle ABC$ is the required triangle.

Q36. Anil borrows a sum of Rs. 8000 from a co – operative bank for the term of 3 years at the rate of 12%. How much would he pay at the end of the terms of loan?

Sol. Principal = Rs. 8000

$$R = 12\%$$

$$N = 3$$

$$I = ?$$

$$I = \frac{PRN}{100}$$

$$= \frac{8000 \times 12 \times 3}{100}$$

$$= \frac{80 \times 100 \times 12 \times 3}{100}$$

$$\therefore I = \text{Rs. } (80 \times 36)$$

$$\therefore I = \text{Rs. } 2880$$

Anil will pay the amount = Principal + Interest

$$\therefore \text{The Amount Anil will pay} = \text{Rs. } (8000 + 2880)$$

$$\therefore \text{Anil will pay Rs. } 10,880 \text{ at the end of the terms of loan.}$$

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