CBSE Class 9 Maths

SAMPLE QUESTION PAPER - 2

Solved

Time : 3 Hours **Maximum Marks : 90**

SECTION 'A'

Question numbers 1 to 4 carry one mark each. For each question four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. **The value of $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ is :**

   (A) $5\sqrt{3}$ (B) 2 (C) $5(\sqrt{5}+\sqrt{7})$ (D) $5\sqrt{35}$

2. **A cubic polynomial has number of zeroes :**

   (A) 2 (B) 1 (C) 3 (D) At least three

3. **If $x+\frac{1}{x}=4$, then the value of $x^2+\frac{1}{x^2}$ is :**

   (A) 18 (B) 14 (C) 16 (D) 20

4. **Zero of a polynomial $p(x) = 2x + 7$ is :**

   (A) 0 (B) –7 (C) $\frac{-7}{2}$ (D) $\frac{7}{2}$

SECTION 'B'

Question numbers 5 to 10 carry two marks each.

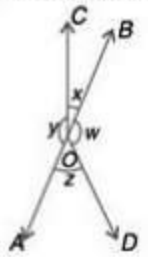
5. Simplify the product : $\left(4\sqrt{3}+3\sqrt{2}\right) \times \left(4\sqrt{3}-3\sqrt{2}\right)$.

6. For what value of k, $(x + 1)$ is a factor of $p(x) = kx^2 - x - 4$?

7. Find the value of the polynomial $x^2 - 9$, for $x = 97$.

8. State any two Euclid's axioms.

9. In the figure, if $x + y = w + z$, then prove that AOB is a line.



OR

An exterior angle of a triangle is 115° and one of the interior opposite angle is 35°. Find the other two angles of the triangle.

10. Find the area of an isosceles triangle whose equal sides are of length 15 cm each and third side is 12 cm.

SECTION 'C'

Question numbers 11 to 20 carry three marks each.

11. Simplify : $\left(\frac{5^{-1}\times 7^{2}}{5^{2}\times 7^{-4}}\right)^{\frac{7}{2}} \times \left(\frac{5^{-2}\times 7^{3}}{5^{3}\times 7^{-5}}\right)^{-\frac{5}{2}}$.

OR

Simplify : $\frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$.

12. If $x^a = y$, $y^b = z$ and $z^c = x$, then prove that $abc = 1$.

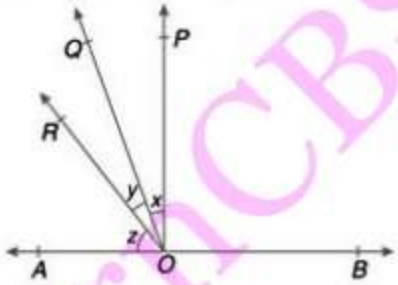
13. Simplify : $\frac{\sqrt{2}}{\sqrt{5}+2} - \frac{2}{\sqrt{10}-2\sqrt{2}} + \frac{8}{\sqrt{2}}$

OR

Find the value of $27x^3 + 8y^3$, if $3x + 2y = 20$ and $xy = \frac{11}{9}$

14. Simplify : $\frac{\left(a^2-b^2\right)^3+\left(b^2-c^2\right)^3+\left(c^2-a^2\right)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$.

15. In the given figure, $PO \perp AB$. If $x : y : z = 1 : 3 : 5$, then find the degree measure of x, y and z.



OR

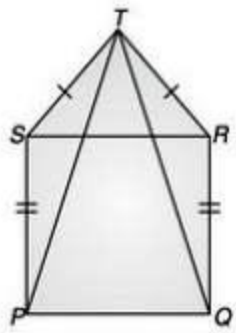
Prove that the sum of angles of a triangle is 180°.

16. PQR is a triangle in which $PQ = PR$. S is any point on the side PQ. Through S, a line is drawn parallel to QR intersecting PR at T. Prove that $PS = PT$.

17. In figure, $PQRS$ is a square and SRT is an equilateral triangle. Prove that :

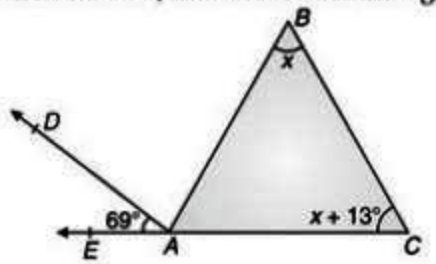
(i) $PT = QT$

(ii) $\angle TQR = 15°$

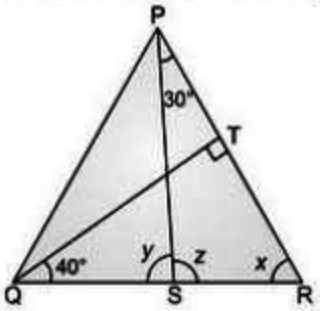


18. The perimeter of a rhombus is 52 cm. One of the diagonal is 24 cm. Find the area of the rhombus.

19. In the given figure, $\angle CAB : \angle BAD = 1 : 2$, find all the internal angles of ΔABC.



20. In the figure, $QT \perp PR$, $\angle TQR = 40°$ and $\angle SPR = 30°$. Find x, y and z.



SECTION 'D'

Question numbers 21 to 31 carry four marks each.

21. Factorise : $2x^3 - 9x^2 + x + 12$.

OR

Prove that : $(x-a)^3 + (x-b)^3 + (x-c)^3 - 3(x-a)(x-b)(x-b)(x-c) = 0$, when $a + b + c = 3x$

22. Evaluate : $\dfrac{4}{(2187)^{-\frac{3}{7}}} - \dfrac{5}{(256)^{-\frac{1}{4}}} + \dfrac{2}{\left(1331^2\right)^{-\frac{1}{3}}}$

23. Prove that $2x^3 + 2y^3 + 2z^3 - 6xyz = (x + y + z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$.

Hence evaluate : $2(13)^3 + 2(14)^3 + 2(15)^3 - 6 \times 13 \times 14 \times 15$.

24. (i) Using suitable identity evaluate $(998)^3$.

(ii) Which mathematical concept is used in this problem ?

(iii) What is its value ?

25. Find the values of a and b, if $x^2 - 4$ is a factor of $ax^4 + 2x^3 - 3x^2 + bx - 4$ and hence factorise it completely.

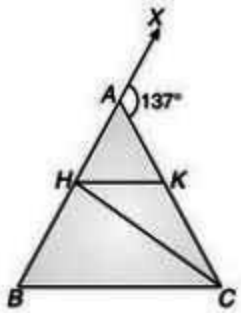
26. Plot the following points on the graph sheet.

$A(-3, -4)$, $B(-2, 0)$, $C(-1, 4)$, $D(1, 0)$.

These points lie in which quadrant or axes ?

27. In ΔABC and ΔPQR, $AB = PQ$, $AC = PR$ and altitude AM and PN are equal. Show that, $\Delta ABC \cong \Delta PQR$.

28. In figure, $AB = AC$, $CH = CB$ and $HK \parallel BC$. If $\angle CAX = 137°$, then find $\angle CHK$.



OR

ABCD is a quadrilateral in which AB and *CD* are smallest and longest sides respectively. Prove that $\angle A > \angle C$ and $\angle B > \angle D$.

29. Show that sum of all sides of a quadrilateral is greater than the sum of its diagonals.

OR

Diagonals *AC* and *BD* of a quadrilateral *ABCD* intersect each other at *O*. Prove that :

$AB + BC + CD + DA > AC + BD$.

30. If two parallel lines are intersected by a transversal, then prove that bisectors of the interior angles form a rectangle.

31. Ganesh had a 16 × 10 rectangular paper. He had to make a kite from it, so he marked the mid points of all the four sides and joined them to form a rhombus. He then cut the rhombus to form a kite. Later he attached an isosceles triangle with sides 5, 6, 5 to the kite as a base. Find the total area of the kite.