CBSE Class 9 Maths

SAMPLE QUESTION PAPER - 4

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. $(a + \sqrt{b})(a - \sqrt{b})$ is equal to :

   (A) $b^2 - a^2$ (B) $a^2 - b^2$ (C) $a^2 - b$ (D) $b^2 - a$

2. The maximum number of zeroes in the polynomial $p(x) = 3x^2 + 2x - 1$ is :

   (A) 1 (B) 3 (C) 4 (D) 2

3. The coefficient of x^3 in the expansion of $m^3\left(1 - \frac{x}{m}\right)^3$ is :

   (A) m^3 (B) $\frac{1}{m^3}$ (C) -1 (D) 1

4. Degree of polynomial $3x^3 - x^4 + 5x + 3$ is :

   (A) 3 (B) –4 (C) 4 (D) 1

SECTION 'B'

Question numbers 5 to 10 carry two marks each.

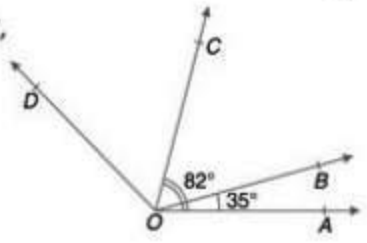
5. Simplify : $\left(4x + \sqrt{5}y\right) \times \left(4x - \sqrt{5}y\right)$.

6. Find the remainder when the polynomial $p(y) = y^4 - 3y^2 + 7y - 10$ is divided by $(y - 2)$.

7. Simplify : $\left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)\left(x^4 + \frac{1}{x^4}\right)$

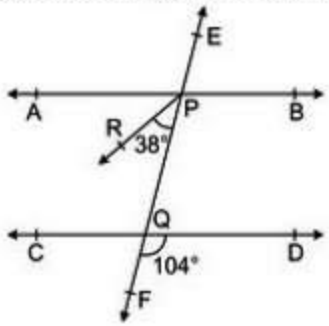
8. If a point C lies between two points A and B such that $AC = BC$, then prove that $AC = \frac{1}{2}AB$

9. In figure, $\angle DOB = 87°$ and $\angle COA = 82°$. If $\angle BOA = 35°$, then find $\angle COB$ and $\angle COD$.



OR

In the figure, PR is the angle bisector of $\angle APQ$. Prove that $AB \parallel CD$.



10. Find the area of a rhombus whose perimeter is 200 m and one of the diagonal is 80 cm.

SECTION 'C'

Question numbers 11 to 20 carry three marks each.

11. Evaluate : $\left(\sqrt{2}+\sqrt{3}\right)^2 + \left(\sqrt{5}-\sqrt{2}\right)^2$

OR

Simplify : $\left(\sqrt{x}\right)^{-\frac{2}{3}} \sqrt{y^4} \div \sqrt{(xy)^{-\frac{1}{2}}}$.

12. If $\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{2x-8}$, then find the value of x.

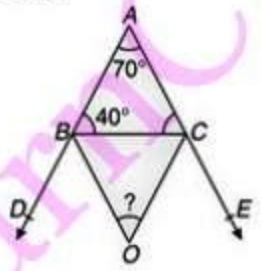
13. Using remainder theorem, factorise :
$6x^3 - 25x^2 + 32x - 12$.

OR

Find the product $(x + y + 2z)\,(x^2 + y^2 + 4z^2 - xy - 2yz - 2zx)$

14. If $a^2 + b^2 + c^2 = 280$ and $ab + bc + ca = \frac{9}{2}$, then find the value of $(a + b + c)^3$.

15. In the given figure, BO and CO are bisectors of $\angle DBC$ and $\angle ECB$ respectively. If $\angle BAC = 70°$ and $\angle ABC = 40°$, find the measure of $\angle BOC$.



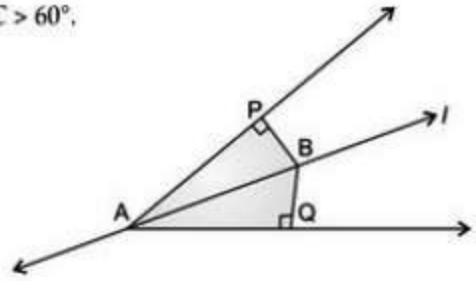
OR

In ΔABC, if AB is the greatest side, then prove that $\angle C > 60°$.

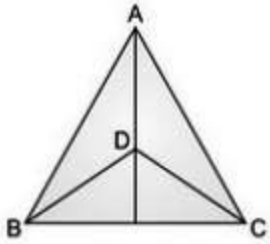
16. Line l bisects $\angle A$ and B is any point on line l. BP and BQ are perpendiculars drawn from B on arms of $\angle A$.
Prove that :

(i) $\Delta APB \cong \Delta AQB$

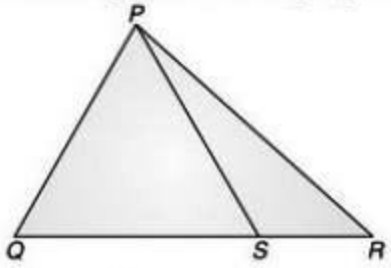
(ii) $BP = BQ$.



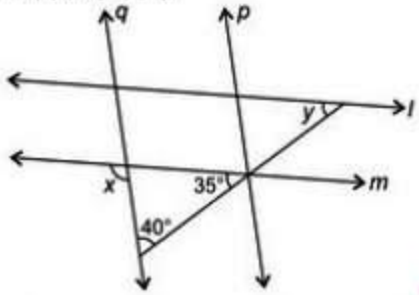
17. In the given figure, $AB = AC$, D is the point in the interior of ΔABC such that $\angle DBC = \angle DCB$. Prove that AD bisects $\angle BAC$ of ΔABC.



18. In ΔPQR, if S is any point on the side QR. Show that $PQ + QR + RP > 2PS$.



19. In the figure, find x and y, if $l \,||\, m$, $p \,||\, q$.



20. A triangle and parallelogram have the same base and same area. If the sides of the triangle are 15 cm, 14 cm and 13 cm and the parallelogram stands on the base 14 cm, find the height of parallelogram.

SECTION 'D'

Question numbers 21 to 31 carry four marks each.

21. Evaluate : $\dfrac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \dfrac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}} - \dfrac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}}$

OR

(i) Find three different irrational numbers between the rational numbers $\dfrac{5}{7}$ and $\dfrac{9}{11}$.

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

(iii) What is its value ?

22. Evaluate : $\dfrac{\left(\frac{9}{4}\right)^{-3/2} \times \left(\frac{125}{27}\right)^{-2/3} \times \left(\frac{3}{5}\right)^{-2}}{\left(\sqrt{2}\right)^4}$

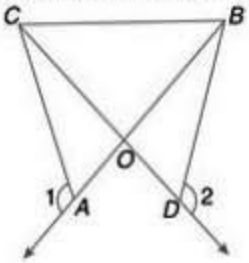
23. If $x^2 - 3x + 2$ is a factor of polynomial $x^4 - ax^3 + b$, then find the values of a and b.

24. If $x^2 + \dfrac{1}{x^2} = 23$, then find the value of $x^3 + \dfrac{1}{x^3}$.

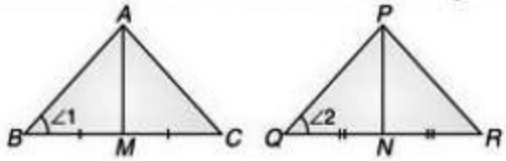
25. If a, b, c are real numbers and $a^2 + b^2 + c^2 - ab - bc - ca = 0$, then show that $a = b = c$.

26. Plot (– 3, 0), (5, 0) and (0, 4) on the cartesian plane. Name the figure formed by joining these points and find its area.

27. In figure, $OA = OD$ and $\angle 1 = \angle 2$. Prove that ΔOCB is an isosceles triangle.



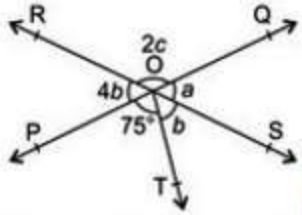
28. Prove that "Two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle".



OR

Show that the difference of any two sides of a triangle is less than the third side.

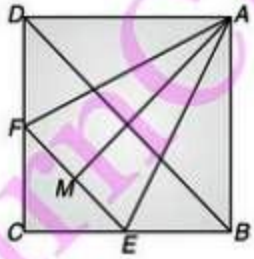
29. In figure, two straight lines PQ and RS intersect each other at O. If $\angle POT = 75°$, find the value of a, b and c.



30. In figure, $ABCD$ is a square and EF is parallel to diagonal BD and $EM = FM$. Prove that :

(i) $DF = BE$

(ii) AM bisects $\angle BAD$.



31. In figure, it is given that $RT = TS$, $\angle 1 = 2\angle 2$ and $\angle 4 = 2\angle 3$. Prove that :

(i) $\Delta RBT \cong \Delta SAT$

(ii) $RB = AS$