CBSE Class 9 Maths

SAMPLE QUESTION PAPER - 3

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. **Simplify** $\sqrt[4]{\sqrt[3]{2^2}}$

   (A) $(2)^{\frac{1}{6}}$ (B) $\frac{16}{3}$ (C) $(2)^{\frac{1}{4}}$ (D) $\frac{18}{3}$

2. **If -4 is the zero of the polynomial $p(x) = x^2 + 11x + k$, then value of k is :**

   (A) 40 (B) -28 (C) 28 (D) 5

3. **Maximum number of zeroes in a cubic polynomial are :**

   (A) 0 (B) 1 (C) 2 (D) 3

4. **Common factor in quadratic polynomials $x^2 + 8x + 15$ and $x^2 + 3x - 10$ is :**

   (A) $x + 3$ (B) $x + 5$ (C) $x - 5$ (D) $x - 3$

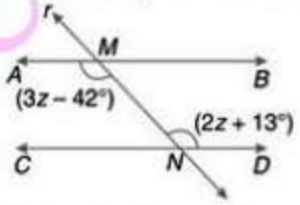
SECTION 'B'

Question numbers 5 to 10 carry two marks each.

5. Find any two irrational numbers between 0.5 and 0.55.
6. Show that $(x - 1)$ is a factor of the polynomial $f(x) = 2x^3 - 3x^2 + 7x - 6$.
7. Using suitable identity evaluate $(103)^3$.
8. In figure, if $AC = BD$, then prove that $AB = CD$.
9. In ΔABC, $\angle A = 60°$, $\angle B = 40°$. Which side of this triangle is the smallest ? Give reason for your answer.

   OR

   In the figure, $AB \parallel CD$, find the value of z, $\angle DNM$ and $\angle CNM$.



10. Find the area of an equilateral triangle whose perimeter is 60 cm.

SECTION 'C'

Question numbers 11 to 20 carry three marks each.

11. Factorise : $a^7 + ab^6$.

12. Find the values of a and b, when $a + b\sqrt{15} = \dfrac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$.

13. Factorise : $\left(5a+\dfrac{2}{3}\right)^2 - \left(2a-\dfrac{1}{3}\right)^2$.

OR

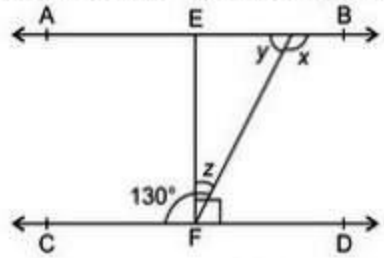
Factorise : $a^6 - b^6$

14. If $x - a$ is the factor of $3x^2 - mx - nx$, then prove that $a = \dfrac{m+n}{3}$.

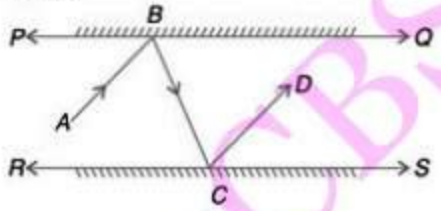
15. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

OR

In the figure, $AB \parallel CD$, $EF \perp CD$ and $\angle GFC = 130$. Find x, y and z.



16. In the figure, PQ and RS are two similar mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirrors RS at C and again reflects back along CD.

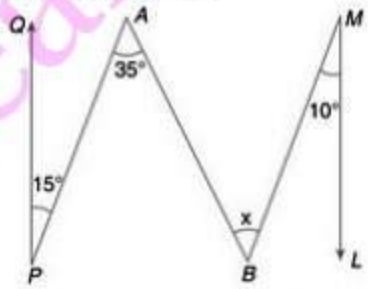


(i) Prove that $AB \parallel CD$.

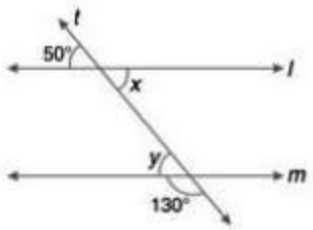
(ii) Which mathematical concept is used in this problem ?

(iii) Which value is depicted in this question ?

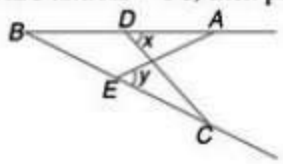
17. In the given figure, $QP \parallel ML$, find the value of x.



18. In the given figure, find x and y and then show that $l \parallel m$.



19. In the given figure, if $\angle ADC = \angle AEC$ and $AB = BC$, then prove that $AE = CD$.



20. A field is in the shape of a trapezium whose parallel sides are 25 m and 10 m. The non-parallel sides are 14 m and 13 m. Find the area of the field.

SECTION 'D'

Question numbers 21 to 31 carry four marks each.

21. If $x = \dfrac{\sqrt{3}+1}{\sqrt{3}-1}$, $y = \dfrac{\sqrt{3}-1}{\sqrt{3}+1}$ then find the value of $x^2 + y^2 + xy$.

OR

If $x = 3 - 2\sqrt{2}$, find $x^3 - \dfrac{1}{x^3}$.

22. Prove that : $\dfrac{1}{\sqrt{4}+\sqrt{5}} + \dfrac{1}{\sqrt{5}+\sqrt{6}} + \dfrac{1}{\sqrt{6}+\sqrt{7}} + \dfrac{1}{\sqrt{7}+\sqrt{8}} + \dfrac{1}{\sqrt{8}+\sqrt{9}} = 1.$

23. Factorise : $x^3 + 13x^2 + 32x + 20$

24. If $a + b + c = 6$ and $ab + bc + ca = 11$, find the value of $a^3 + b^3 + c^3 - 3abc$.

25. In which quadrant or on which axis do each of the points $(-2, 4)$, $(3, -1)$, $(-1, 0)$, $(-3, -5)$ and $(1, 2)$ lie ?

Verify your answer by locating them on the cartesian plane.

26. The polynomials $ax^3 - 3x^2 + 4$ and $2x^3 - 5x + a$ when divided by $(x - 2)$ leave the remainders p and q respectively. If $p - 2q = 4$, find the value of a.

27. 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.

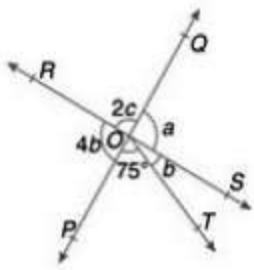
28. Two sides AB, BC and median AM of one triangle ABC are respectively equal to sides PQ, QR and median PN of ΔPQR.

Show that,

(i) $\Delta ABM \cong \Delta PQN$ **(ii)** $\Delta ABC \cong \Delta PQR$

OR

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



29. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC. If AD is extended to intersect BC at P. show that :

(i) $\Delta ABD \cong \Delta ACD$

(ii) $\Delta ABP \cong \Delta ACP$

(iii) AP bisects $\angle A$ as well as $\angle D$.

30. $ABCD$ is a square. X and Y are points on sides AD and BC respectively such that $AY = BX$. Prove that $BY = AX$ and $\angle BAY = \angle ABX$.

31. Rana has two adjacent triangular fields. He grows wheat in a field with sides 25, 52 and 63 m. He divided the adjacent field with sides 25, 101 and 114 m into two parts by joining the midpoint of the longest side to the opposite vertex. He grew rice in one part and vegetables in the other. Find the area in which he grew wheat, rice and vegetables.