CBSE Class 9 Maths

SAMPLE QUESTION PAPER - 7

Self Assessment

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. **Write the coordinate of any point on x–axis.**

   (A) $(0, 0)$ **(B)** $(0, -y)$ **(C)** $(x, 0)$ **(D)** $(0, y)$

2. **In the expression $x^2 + \frac{\pi}{2}x - 7$, the coefficient of x is :**

   (A) $\frac{1}{2}$ **(B)** 7 **(C)** -7 **(D)** $\frac{\pi}{2}$

3. **If $x^{11} + 101$ is divided by $x + 1$, then remainder is :**

   (A) -1 **(B)** 102 **(C)** 0 **(D)** 100

4. **Constant polynomial is :**

   (A) $7x$ **(B)** $7x^2$ **(C)** $7x^3$ **(D)** 7

SECTION 'B'

Question numbers 5 to 10 carry two marks each.

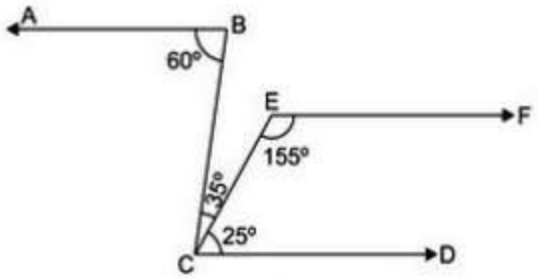
5. Taking $\sqrt{2} = 1.414$ and $\pi = 3.141$, evaluate $\frac{1}{\sqrt{2}} + \pi$ upto three places of decimal.

6. Find the value of $x^2 + \frac{1}{x^2}$, if $x - \frac{1}{x} = \sqrt{3}$.

7. Expand $\left(\frac{a}{4} - \frac{b}{2} + 1\right)^2$ using identity.

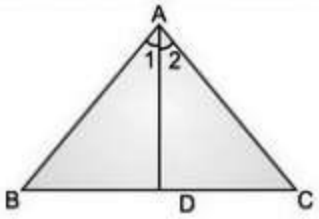
8. If in a triangle ABC, $\angle A + \angle B = 108°$, $\angle B + \angle C = 130°$, find all the three angles.

9. In the given figure, show that $AB \parallel EF$.



OR

In ΔABC, $\angle B = 45°$, $\angle C = 55°$, AD bisects $\angle A$. Find $\angle ADB$ and $\angle ADC$.



10. If the area of an equilateral triangle is $81\sqrt{3}$ cm^2. Find its perimeter.

SECTION 'C'

Question numbers 11 to 20 carry three marks each.

11. Find x, if $\left(\frac{2}{3}\right)^x \cdot \left(\frac{3}{2}\right)^{2x} = \frac{18}{16}$.

OR

If $x = \frac{\sqrt{p+2q} + \sqrt{p-2q}}{\sqrt{p+2q} - \sqrt{p-2q}}$, then show that : $qx^2 - px + q = 0$.

12. Evaluate : $\sqrt{5+2\sqrt{6}} + \sqrt{8-2\sqrt{15}}$.

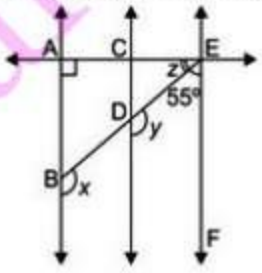
13. Polynomials $3x^3 - 5x^2 + kx - 2$ and $-x^3 - x^2 + 7x + k$ leave the same remainder when divided by $x + 2$. Find the value of k.

OR

Factorise : (i) $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$, (ii) $x^4 - y^4$

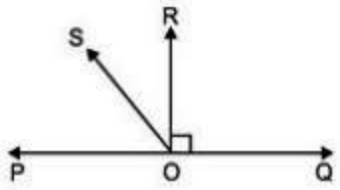
14. If $(3x - 2)$ is a factor of $3x^3 + x^2 - 20x + 12$, find other factors.

15. In fig., $AB \parallel CD$, $CD \parallel EF$ and $EA \perp AB$. If $\angle BEF = 55°$, find the values of x, y, and z.



OR

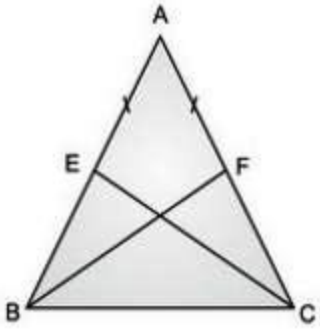
In figure POQ is a line. Ray OR is perpendicular to PQ. OS is another ray lying between OP and OR. Prove that : $\angle ROS = \frac{1}{2}[\angle QOS - \angle POS]$.



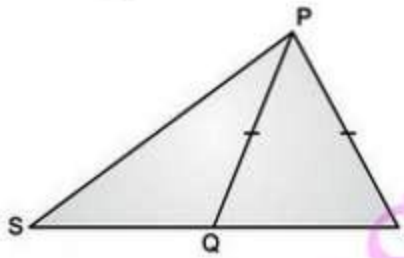
16. E and F are mid-points of equal sides AB and AC of ΔABC respectively. Show that $BF = CE$.

OR

In the given figure, ABC is an isosceles Δ in which altitudes BF and CE are drawn to equal sides AC and AB respectively. Show that these altitudes are equal.

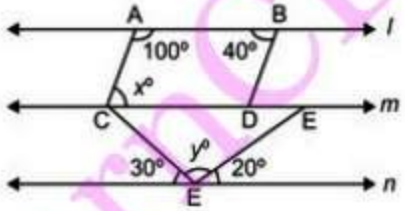


17. In figure, $PQ = PR$. Show that $PS > PQ$.

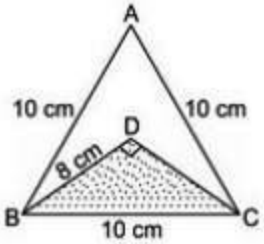


18. AD, BE and CF, the altitudes of ΔABC are equal. Prove that ΔABC is an equilateral triangle.

19. In the given figure $l \parallel m \parallel n$. From the figure, find the ratio of $(x + y) : (y - x)$.



20. In the given figure, ΔABC is equilateral with side 10 cm and ΔDBC is right angled at D. If $BD = 8$ cm, find the area of the unshaded portion $\left[\sqrt{3} = 1.732\right]$.



SECTION 'D'

Question numbers 21 to 31 carry four marks each.

21. If $x = 3 - 2\sqrt{2}$, find the value of $x^4 - \frac{1}{x^4}$.

OR

Evaluate : $\frac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$, given that $\sqrt{5} = 2.2$ and $\sqrt{10} = 3.2$.

22. If $x + y + z = 1$, then show that :

$(1 + x + y^{-1})^{-1} + (1 + y + z^{-1})^{-1} + (1 + z + x^{-1})^{-1} = 1$.

23. Find the quotient and remainder when $6x^4 + 11x^3 + 13x^2 - 3x + 27$ is divided by $3x + 4$. Also check the remainder obtained by using remainder theorem.

24. Factorise : **(a)** $4a^2 - 9b^2 - 2a - 3b$.

(b) $a^2 + b^2 - 2(ab - ac + bc)$.

25. The polynomials $x^3 + 2x^2 - 5ax - 8$ and $x^3 + ax^2 - 12x - 6$ when divided by $(x - 2)$ and $(x - 3)$ leave the remainder p and q respectively. If $q - p = 10$, find the value of a.

26. **(i)** Plot the points $M(5, -3)$ and $N(-3, -3)$.

(ii) What is the length of MN ?

(iii) Find the co-ordinates of points A, B and C lying on MN such that

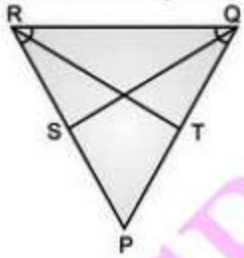
$MA = AB = BC = CN$.

27. **(i)** Does Euclid's fifth postulate imply the existence of parallel lines ? Explain.

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

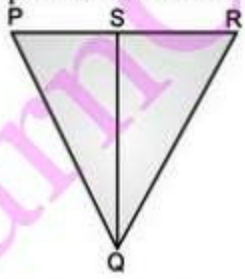
(iii) What is its value ?

28. In given fig., $RS = QT$ and $QS = RT$. Prove that $PQ = PR$.

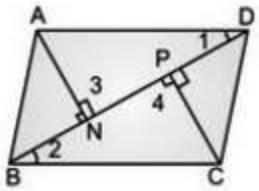


OR

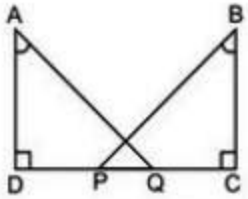
In given fig., $PQ = PR$ and S is any point on side PR. Prove that $RS < QS$.



29. In given fig., AN and CP are perpendiculars to the diagonal BD of a parallelogram $ABCD$. Prove that $AN = CP$.



30. In given fig, $AD \perp CD$ and $BC \perp CD$. If $AQ = BP$ and $DP = CQ$, prove that :
$\angle DAQ = \angle CBP$.



31. An umbrella is made by stitching 10 triangular pieces of cloth of two different colours (see figure), each piece measuring 20 cm, 50 cm and 50 cm. How much cloth of each colour is required for the umbrella ?