



**ST KABIR PUBLIC SCHOOL
SECTOR 26, CHANDIGARH
MID TERM EXAMINATION, 2024-25**

**Class- IX
Subject-Mathematics (041)**

**Duration-3 Hours
Max. Marks - 80**

General Instructions:

Read the following instructions very carefully and strictly follow them:

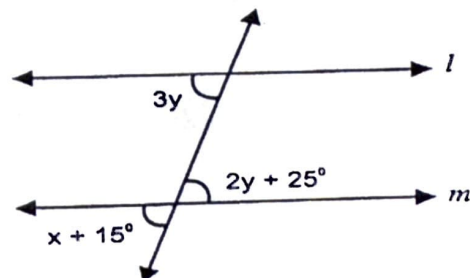
- (i) This question paper contains 38 questions. All questions are compulsory.
- (ii) This question Paper is divided into five Sections - A, B, C, D and E.
- (iii) In Section A, Questions no. 1 to 18 are multiple choice questions (MCQs) and questions number 19 and 20 are Assertion-Reason based questions of 1 mark each.
- (iv) In Section B, Questions no. 21 to 25 are very short answer (VSA) type questions, carrying 2 marks.
- (v) In Section C, Questions no. 26 to 31 are short answer (SA) type questions, carrying 3 marks each.
- (vi) In Section D, Questions no. 32 to 35 are long answer (LA) type questions, carrying 5 marks each.
- (vii) In Section E, Questions no. 36 to 38 are case study-based questions carrying 4 marks each. Internal choice is provided in 2 marks questions in each case- study.
- (viii) There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Sections in Section C, 2 questions in Section D and 3 questions in Section E.
- (ix) Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.
- (x) Use of calculators is **not** allowed.

SECTION – A

This section comprises multiple choice questions (MCQs) of 1 mark each.

- Q 1.** Which of the following is irrational? (1)
 (a) $\sqrt{\frac{4}{9}}$ (b) $\frac{\sqrt{12}}{\sqrt{3}}$ (c) $\sqrt{7}$ (d) $\sqrt{81}$
- Q 2.** $\left(\frac{54}{250}\right)^{\frac{1}{3}}$ equals: (1)
 (a) $\frac{9}{25}$ (b) $\frac{3}{5}$ (c) $\frac{27}{125}$ (d) $\frac{\sqrt[3]{2}}{5}$
- Q 3.** One angle is equal to three times its supplement. The measure of the angle is (2)
 (a) 130° (b) 135° (c) 90° (d) 120°
- Q 4.** If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$ is (1)
 (a) 0 (b) 1 (c) $4\sqrt{2}$ (d) -1
- Q 5.** The coefficient of x^2 in $(2x^2 - 5)(4 + 3x^2)$ is (2)
 (a) 7 (b) -7 (c) 2 (d) 3

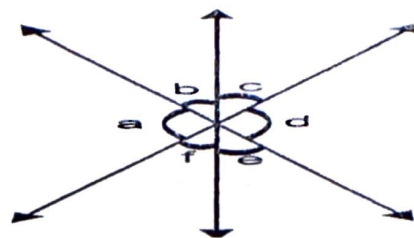
- Q 6. Ordinate of all points on the x - axis is (1)
 (a) 0 (b) 1
 (c) any number (d) none of these
- Q 7. If $A(-2, 3)$ and $B(-3, 5)$ are two given points then $(\text{Abscissa of } A) - (\text{Abscissa of } B) = ?$ (1)
 (a) -2 (b) 1 (c) -1 (d) 2
- Q 8. If $(x + 3, 5) = (2, 2 - y)$ then the values of x and y are (1)
 (a) $x = 5, y = 3$ (b) $x = -1, y = -3$
 (c) $x = 0, y = -3$ (d) $x = 1, y = 3$
- Q 9. If the corresponding angles of two triangles are equal, then they are always congruent. (1)
 (a) True (b) False
 (c) Cannot be determined (d) None of these
- Q10. Which the following point does not lie on the line $y = 3x + 4$? (1)
 (a) (1, 7) (b) (2, 10) (c) (-1, 1) (d) (4, 12)
- Q11. The condition that the equation $ax + by + c = 0$ represents a linear equation in two variables is (1)
 (a) $a \neq 0, b = 0$ (b) $b \neq 0, a = 0$
 (c) $a = 0, b = 0$ (d) $a \neq 0, b \neq 0$
- Q12. Any solution of the linear equation $2x + 0.y + 9 = 0$ in two variables is of the form (1)
 (a) $(-\frac{9}{2}, m)$ (b) $(n, -\frac{9}{2})$ (c) $(0, -\frac{9}{2})$ (d) $(-9, 0)$
- Q13. 'Lines are parallel if they do not intersect' is stated in the form of (1)
 (a) an axiom (b) a definition (c) a postulate (d) a proof
- Q14. Pythagoras was a student of (1)
 (a) Thales (b) Euclid
 (c) Rene Descartes (d) Archimedes
- Q15. The number of interwoven isosceles triangles in Sriyantra (in the Atharvaveda) is (1)
 (a) Seven (b) Eight (c) Nine (d) Eleven
- Q16. The measure of an angle is five times its complement. The angle measures (1)
 (a) 25° (b) 35° (c) 65° (d) 75°
- Q17. In figure, if $l \parallel m$, then the value of x is (1)
 (a) 30° (b) 45°
 (c) 50° (d) 60°



Q18. In figure, which of the following statements must be true? (1)

- (i) $a + b = d + c$ (ii) $a + c + e = 180^\circ$
 (iii) $b + f = c + e$

- (a) (i) only (b) (ii) only
 (c) (iii) only (d) (ii) and (iii) only



Questions number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Choose the correct option. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 (b) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of Assertion (A).
 (c) Assertion (A) is true, but Reason (R) is false.
 (d) Assertion (A) is false, but Reason (R) is true.

Q19. Assertion (A): The expression $3x^4 - 4x^{\frac{3}{2}} + x^2 - 2$ is not a polynomial because the term $-4x^{\frac{3}{2}}$ contains a rational power of x . (1)

Reason (R): The highest exponent in various terms of an algebraic expression in one variable is called its degree

Q20. Assertion (A): If $x = 1 - k$ and $y = 3k$ is a solution of the equation $4x + y + 3 = 0$, then the value of k is 7. (1)

Reason (R): The solution of the equation satisfies the equation.

SECTION - B

This section comprises very short answer (VSA) type questions of 2 marks each.

Q21. Represent $\sqrt{8.5}$ on the number line. (2)

OR

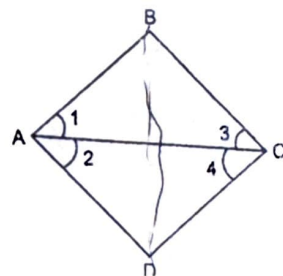
Simplify: $(81)^{\frac{1}{4}} - 8(216)^{\frac{1}{3}} + 15(32)^{\frac{1}{5}} + (225)^{\frac{1}{2}}$

Q22. Factorize: $1 - 2ab - (a^2 + b^2)$. (2)

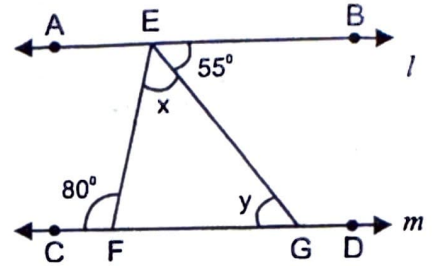
OR

Simplify: $(x + 1)^3 - (x - 1)^3$.

Q23. In the figure, we have $\angle 1 = \angle 3$ and $\angle 2 = \angle 4$. Show that $\angle A = \angle C$. (2)



- Q24. In the given figure, if $AB \parallel CD$, $\angle BEG = 55^\circ$ and $\angle EFC = 80^\circ$ then find x and y .



- Q25. In a quadrilateral $ABCD$, $AB = AD$ and AC bisects $\angle A$. Show that $\triangle ABC \cong \triangle ADC$. (2)

SECTION -C

This section comprises of short answer (SA) type questions of 3 marks each.

- Q26. Express $0.\overline{235}$ in the $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$. (3)

- Q27. Prove that : $9^{\frac{3}{2}} - 3 \times 5^0 - \left(\frac{1}{81}\right)^{-\frac{1}{2}} = 15$ (3)

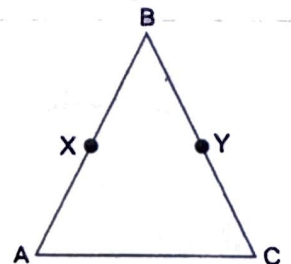
- Q28. State Factor theorem. Using Factor theorem, factorize $x^3 - 3x^2 - x + 3$. (3)

- Q29. A part of monthly expenses of a family on milk is fixed is ₹ 500 and the remaining varies with the quantity of milk, taken extra at the rate of ₹ 20 per kg. Taking the quantity of milk required extra as x kg and the total expenditure on milk ₹ y , write a linear equation for this information. Find two solutions of equation obtained. (3)

OR

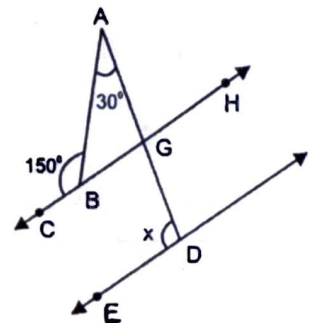
Find the value of k for which the point $(1, -2)$ lies on the graph of linear equation $x - 2y + k = 0$. Hence, find two more solutions of the equation.

- Q30. (a) In the figure, we have $BX = \frac{1}{2} AB$, $BY = \frac{1}{2} BC$ and $AB = BC$. Show that $BX = BY$. (3)



OR

- (b) In the given figure find the value of x , if $BC \parallel DE$ and $\angle ABC = 150^\circ$ and $\angle BAD = 30^\circ$.



- Q31. BE and CF are two equal altitudes of a triangle ABC . Using RHS congruence rule, prove that the triangle ABC is isosceles. (3)

SECTION - D

This section comprises of long answer (LA) type questions of 5 marks each.

- Q32. (a) Simplify the following by rationalizing the denominators:- $\frac{6}{2\sqrt{3}-\sqrt{6}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$ (5)

OR

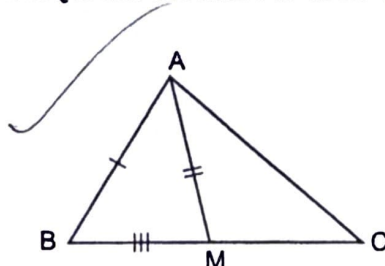
- (b) If $x = 2 - \sqrt{3}$, find the value of $\left(x + \frac{1}{x}\right)^3 + 2\left(x + \frac{1}{x}\right)^2 + \left(x + \frac{1}{x}\right) - 100$.

- Q33. (i) Plot the points $(-2, -1)$, $(-1, -4)$, $(-4, 1)$ and check whether they are collinear or not. (2)

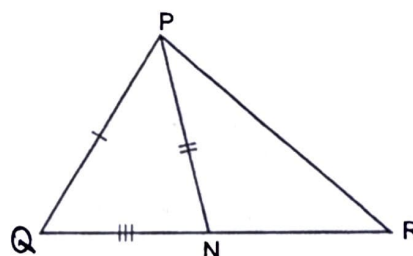
- (ii) Plot the points $(0, -4)$, $(-4, 0)$, $(0, 0)$ on the graph. What type of figure you are getting, find the area and perimeter of it. (3)

- Q34. If two parallel lines are intersected by a transversal, then prove that bisectors of the interior angle form a rectangle. (5)

- Q35. (a) Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle PQR$ (see figure). Show that: (5)



(i) $\triangle ABM \cong \triangle PQN$



(ii) $\triangle ABC \cong \triangle PQR$

OR

- (b) ABC is a right triangle with $AB = AC$. Bisector of $\angle A$ meets BC at D . Prove that $BC = 2AD$.

SECTION - E

This section comprises 3 case study-based questions of 4 marks each.

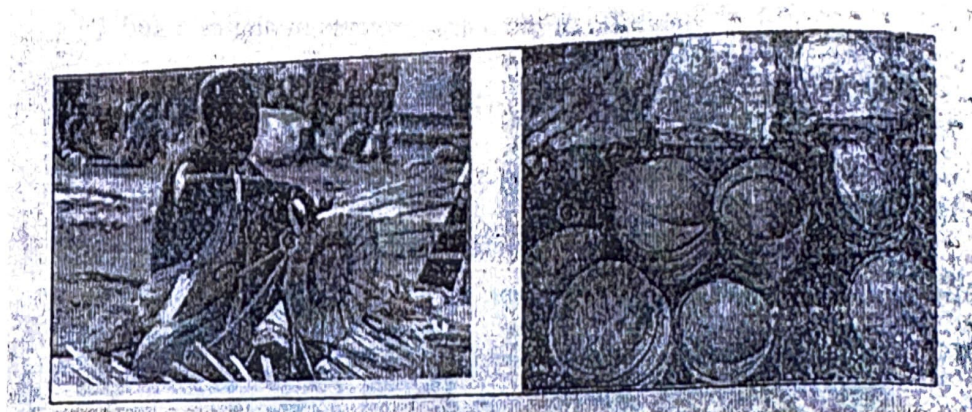
Q36. Case Based Question 1

Read the following and answer the questions given below :

Hiradevi weaves baskets by hand using strips of willow and sells them in 'Haats' (weekly markets held on specific days of the week in different areas).

In a particular week during festival season,

the amount of money she earns by selling her hand made baskets is ₹ $[(x^3 - 1) - (x - 1)]$, if selling price of each basket is ₹ $(x - 1)$, where x is a positive integer greater than 1.



Based on the above information, answer the following questions:

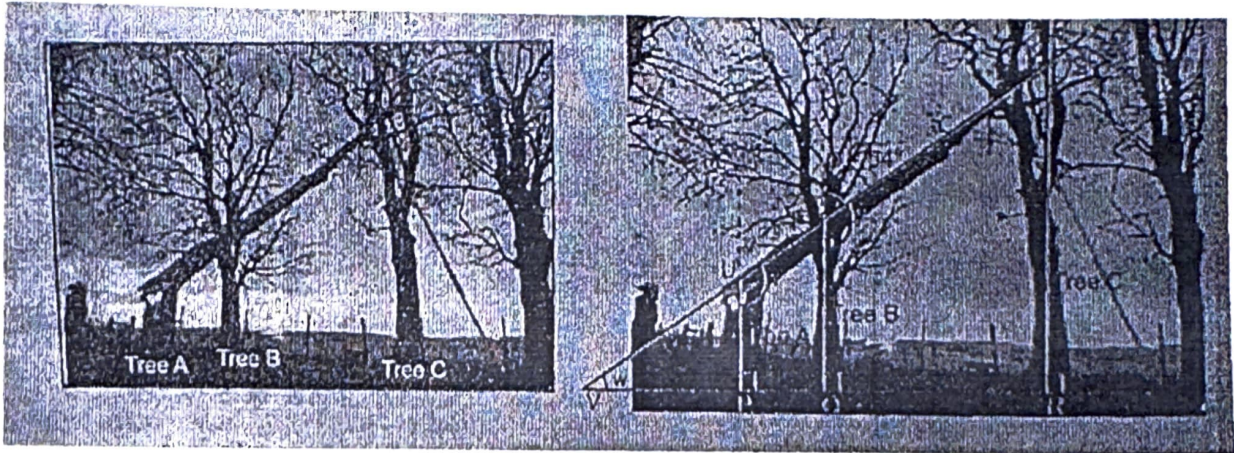
- (i) What are the factors of $[(x^3 - 1) - (x - 1)]$? (1)
- (ii) Find the expression showing the number of baskets sold in that particular week. (1)
- (iii) (a) If she sold each basket for ₹ 20, then find the number of baskets she sold. (2)

OR

- (b) If selling price of one basket is ₹ 20, then find the total amount she collected after sale on that particular week.

Q37. Case Based Question 2

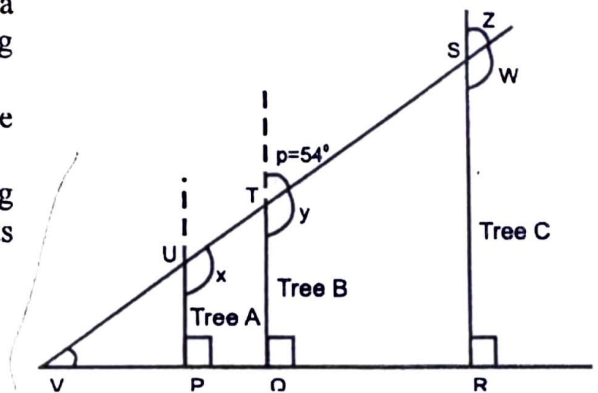
Read the following and answer the questions given below :



Shown below is the picture of tree A that had broken in a storm and its broken part is leaning on two neighbouring trees (standing erect) B and C.

The broken part of tree A leans on the major stem of the tree B at an angle of $p = 54^\circ$

The diagram of the picture is drawn alongside showing angles x, y, z and w being formed and the marked points P, Q, R, S, T, U and V.



- (i) What is the measurement of the angle y ? (2)
- (ii) (a) What is the ratio of the measurements of angles z and w ? (1)

OR

- (b) What is the ratio of the measurements of angles x and y ?

- (iii) Find the ratio of the measurements of angles z and w ? (1)

Q38. Case Based Question 3

A children park is in the shape of isosceles triangle said ΔPQR with $PQ=PR$,
S and T are points on QR such that $QT=RS$.

(i) Which rule is applied to prove that congruency of ΔPQS and ΔPRT ?

(ii) Name the type of ΔPST .

(iii) If $PQ = 6\text{ cm}$ and $QR = 7\text{ cm}$, then find perimeter of PQR.



(2)

(1)

(1)

OR

If $\angle QPR = 80^\circ$, find $\angle PQR$.