MID-TERM EXAMINATION (2025-2026)

MATHEMATICS

CLASS-IX

SET-II

TIME: 3 HOUR MAX MARKS: 80

General Instructions

This Question paper contains **five sections**, A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.

- **Section A** has 18 MCQ's and 2 questions of Assertion-Reason of 1 mark each.
- **Section B** has 5 Very Short Answers type questions of 2 marks each.
- **Section C** has 6 Short Answer type questions of 3 marks each.
- **Section D** has 4 Long Answer type questions of 5 marks each.
- **Section E** has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

SECTION A

1 The value of $\sqrt{6} \times \sqrt{8}$ is: 1

(a) $3\sqrt{4}$ (b) $4\sqrt{3}$ (c) $\sqrt{14}$ (d) $6\sqrt{8}$

2 Which of the linear equation has solution x = 1, y = 3? 1

(a) 3x – y = 2 (b) 3x + y = 3 (c) 3x – y = 0 (d) 3x + y = 5

3 If the perimeter of an isosceles triangle is 32 cm. The ratio of equal sides to the base is 3:2. The shortest side of the triangle is: 1

(a) 10 cm (b) 6 cm (c) 8 cm (d) 12 cm

4 The semi-perimeter of a triangle, if (s – a) = 1 m, (s – b) = 5 m and (s – c) = 10 m is: 1

(a) 8 m (b) 16 m (c) 20 m (d) None of these

5 The abscissa of a point is positive in: 1

(a) I and II quadrant (b) I quadrant only (c) I and IV quadrant (d) I and III quadrant

6 If two supplementary angles are in the ratio 2:3, then the smaller angle will be: 1

(a) 36° (b) 54° (c) 72° (d) 108°

7 If x $(3 + \sqrt{5})$ is a rational number, then x must be equal to: 1

(a) $3 + \sqrt{5}$ (b) $\sqrt{5} - 3$ (c) $\sqrt{3} + \sqrt{5}$ (d) $5 + \sqrt{3}$

8 If a = 2 and b = 3, then the value of $(a^a + b^b)^{-1}$ is equal to: 1

(a) 31 (b) $\frac{1}{31}$ (c) $\frac{1}{13}$ (d) 13

9 Find the values of x and y for which two ordered pairs (x -2, 10) and (5, x + y) are equal. 1

(a) x = 7, y = 3 (b) x = 3, y = 7 (c) x = - 3, y = 7 (d) x = 7, y = - 3

10 If (0, 2) is a solution of the linear equation 2x + 3y = k, then the value of k is: 1

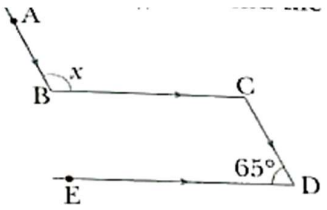
(a) 4 (b) 6 (c) 5 (d) 2

11 A mathematical statement whose truth has been logically established is called: 1

(a) An axiom (b) A postulate (c) A theorem (d) None of these

12 In the given figure, AB || CD and BC || ED. Find the value of x. 1

(a) 115° (b) 65° (c) 25° (d) None of these



13 Which of the following statements are true about using Heron's formula? 1

(i) It can find the area of any triangle as long as the side lengths are known.

(ii) It does not require knowledge of the height of the triangle.

(iii) It works only for equilateral triangles.

Choose the correct option from the following:

(a) (i) and (ii) (b) Only (i) (c) (i) and (iii) (d) (i), (ii) and (iii)

14 Which of the following is not a criterion for congruence of triangles? 1

(a) SAS (b) ASA (c) SSA (d) SSS

15 If AB = QR, BC = RP and CA = PQ, then 1

(a) $\Delta ABC \cong \Delta PQR$ (b) $\Delta CBA \cong \Delta PRQ$ (c) $\Delta BAC \cong \Delta RPQ$ (d) $\Delta BCA \cong \Delta PQR$

16 The decimal expansion of number $\sqrt{2}$ is: 1

(a) A finite decimal (b) 1.41421

(c) Non-terminating and recurring (d) Non-terminating and non-recurring

17 Which of the following line does not pass through origin? 1

(a) $y = \frac{2}{5}x$ (b) y = mx (c) x – y = 0 (d) x + y = 1

18 The perpendicular distance of the point P(4, 3) from x axis is: 1

(a) 4 (b) 3 (c) 5 (d) None of these

19 **Assertion (A):** Two adjacent angles always form a linear pair. 1

Reason (R): In a linear pair of angles, two non-common arms are opposite rays.

(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 reason (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.

20 **Assertion (A):** In ΔABC and ΔPQR, if AB = PQ, AC = PR and $\angle BAC = \angle QPR$. Therefore, $\Delta ABC \cong \Delta PQR$. 1

Reason (R): Both the triangles are congruent by SSS congruence rule.

(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 reason (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.

SECTION B

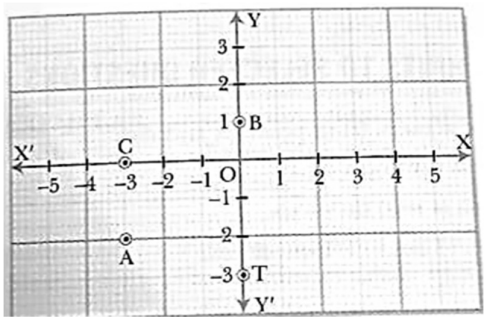
21 Find the mirror image of point (3, - 2) along x-axis and along y-axis. 2

OR

From the given figure, write the:

(a) Coordinates of point A

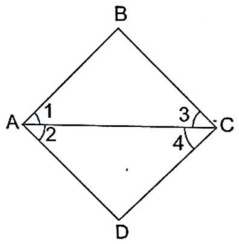
(b) Ordinate of point B



22 Express $5.\overline{2}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. 2

23 In the figure, we have: 2

$\angle 1 = \angle 3$ and $\angle 2 = \angle 4$. Show that $\angle A = \angle C$, using an Euclid axiom.



24 Prove that if two lines intersect, vertically opposite angles are equal. 2

25 Find two different irrational numbers between the rational numbers $\frac{4}{7}$ *and* $\frac{8}{11}$. 2

OR

Find four rational numbers between $\frac{3}{4}$ and $\frac{5}{6}$.

SECTION C

26 Find two solutions for the equation 3x + 2y = 6. How many solutions of this equation are possible? 3

27 Prove that the angles opposite to equal sides of a triangle are equal. 3

OR

Prove that two distinct lines cannot have more than one point in common.

28 Represent $\sqrt{5}$ on the number line. 3

OR

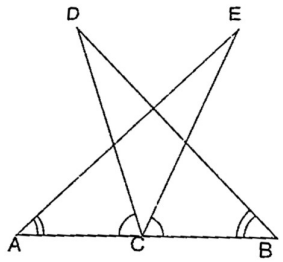
Represent $\sqrt{9.3}$ on the number line.

29 Simplify and give the result in exponent form - 3

$$\frac{(25)^{\frac{5}{2}} \times (729)^{\frac{1}{2}}}{(125)^{\frac{2}{3}} \times (27)^{\frac{2}{3}} \times (8)^{\frac{4}{3}}}$$

30 If every side of an equilateral triangle is doubled, then find the percentage increase in the area of the triangle. 3

31 In the given figure, C is the mid-point of AB, $\angle DCA = \angle ECB$ and $\angle DBC = \angle EAC$. Show that $DC = EC$ and $BD = AE$. 3



SECTION D

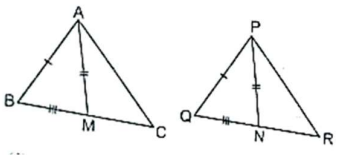
32 Find the value of a and b if: 5

$\frac{7+3\sqrt{5}}{2+\sqrt{5}} - \frac{7-3\sqrt{5}}{2-\sqrt{5}} = a + b\sqrt{5}$

OR

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

33 Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR (see Fig.). 5

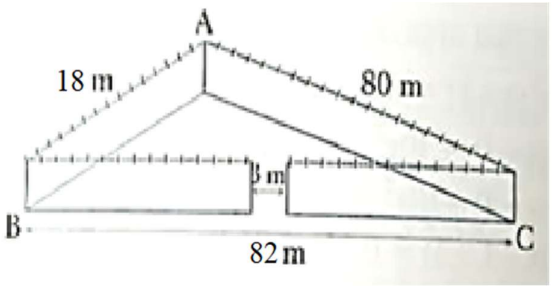


Show that –

(a) $\Delta ABM \cong \Delta PQN$

(b) $\Delta ABC \cong \Delta PQR$

34 The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smallest side. Find the area of the triangle. 5



OR

A triangular field has sides 18 m, 80 m and 82 m. A farmer has to put a fence all around it and also plant corns inside it. How much area does he need to plant corns? Find the cost of fencing it with barbed wire at the rate of ₹20 per meter leaving a space 3 m wide for a gate on one side.

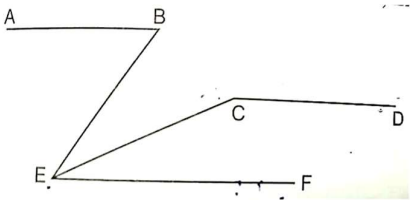
35 It is given that, $\angle XYZ = 64°$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$. 5

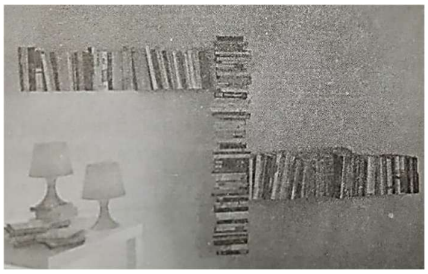
SECTION E

36 Three book shelves AB, CD and EF, made up of wooden boards are fitted on the wall horizontal to the floor as shown in the figure. To give stability and a good look the two shelves AB and CD were joined by a wooden plank BE. Similarly, CD and EF were joined by CE. The entire arrangement was such that the angles measured as follows:

$\angle ABE = 66°, \angle BEC = 36°, \angle CEF = 30°, \angle DCE = 150°$

Based on the above information and the given figure, answer the following questions:





(a) What is the measure of $\angle BEF$? 1

(b) What is the relation between the angles $\angle ABE$ and $\angle BEF$? 1

(c) What is the relation between $\angle DCE$ and $\angle CEF$? 2

OR

What can we conclude about CD and EF?

37 In Delhi taxi cabs are running on compressed gas. To hire a taxi cab, one has to go to the location called taxi stand or book it on a mobile app. Shaila wanted to hire a taxi. So, on enquiring the taxi charges from the prepaid taxi booking office, she got the following information: For the first km the fare is ₹20 and for the subsequent distance, its ₹12 per km.

Refer the given information and answer the following questions by taking distance covered as x km and the total fare as ₹y.

(a) Write the linear equation for the above-mentioned information. 1

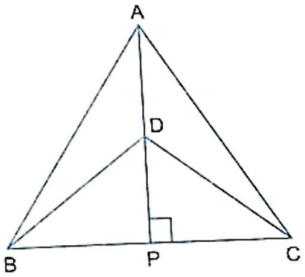
(b) Express the linear equation obtained in the form ax + by + c = 0 and indicate the values of a, b and c. 1

(c) If Shaila has hired the taxi for 26 km, then find the amount to be paid by her as taxi fare. 2

OR

Using variables x and y, write a linear equation whose solution is (a, - a).

38 A farmer in his triangular field, wants to grow wheat, rice, sugarcane and cotton. He divides his field in four parts (as shown in the figure). He wants to grow wheat and rice in triangles of exactly same shape and similarly in other two triangles of same shape, he wants to grow sugarcane and cotton.



In figure, ΔABC and ΔDBC are two isosceles triangles and AP is perpendicular to side BC.
Based on the above information, answer the following questions:

(a) In which triangle farmer will grow wheat if he grows rice in triangle ABD? 1

(b) The farmer will choose which triangles for cotton and sugarcane? 1

(c) Show that $\Delta APB \cong \Delta APC$. 2

OR

ΔABC is a right-angled triangle in which $AB = AC$ and $\angle A = 90°$, then find the measure of $\angle B$ and $\angle C$.