

CAMBRIDGE SCHOOL SRINIVASAPURI
HALF YEARLY EXAMINATION - 2025 - 26
MATHEMATICS (041)
CLASS IX

Time: 3 hours

MM: 80

General Instructions:

- (1) This question paper contains 38 questions. All questions are compulsory.
- (2) Question paper is divided into FIVE sections - Section A, B, C, D and E.
- (3) In Section A, question number 1 to 18 are multiple choice questions (MCQs) and question number 19 and 20 are Assertion-Reason based questions of 1 mark each.
- (4) In Section B, question number 21 to 25 are Very Short Answer (VSA) type questions carrying 2 marks each.
- (5) In Section C, question number 26 to 31 are Short Answer (SA) type questions carrying 3 marks each.
- (6) In Section D, question number 32 to 35 are long answer (LA) type questions carrying 5 marks each.
- (7) In Section E, question number 36 to 38 are case based integrated units of assessment questions carrying 4 marks each. Internal choice is provided in 2 marks question in each case study.
- (8) There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 3 questions of 2 marks in Section E.
- (9) Draw neat figures wherever required.
- (10) Use of calculator is NOT allowed.

SECTION A

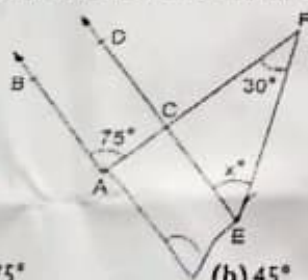
This section consists of 20 questions of 1 mark each.

20x1=20

1. Signs of the abscissa and ordinate of a point in the second quadrant are:

(a) (+, +)	(b) (-, -)	(c) (-, +)	(d) (+, -)
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2. Which of the following point does not lie on the line $y = 5x + 4$?

(a) (2, 14)	(b) (-1, -1)	(c) (0, 4)	(d) (4, 12)
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3. Given that $AB \parallel CD$, find the value of x .



$$0 + 4 = 4$$

$$20 + 4$$

$$24$$

$$-5 + 4 = -1$$

$$10 + 4 = 14$$

(a) 75°

(b) 45°

(c) 105°

(d) 30°

4. Distance of the point (-2, 5) from y-axis is:

(a) -2 units

(b) 5 units

(c) 3 units

(d) 2 units

5. The area of an equilateral triangle is $4\sqrt{3} \text{ cm}^2$. Then each side of the triangle is:

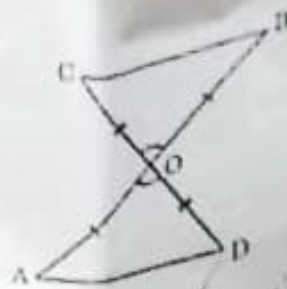
(a) 2 cm

(b) 4 cm

(c) 6 cm

(d) 16 cm

6. In the given figure, $OA = OB$ and $OD = OC$ then $\triangle AOD \cong \triangle BOC$ by _____ rule of congruence.



(a) SSS

(b) SAS

(c) SSA

(d) ASA

7. For what value of x does the relation holds: $5^{x-3} \times 3^{2x-8} = 225$?

(a) 5

(b) 2

(c) 3

(d) 7

8. The base of an isosceles right triangle is 30 cm. Its area is:

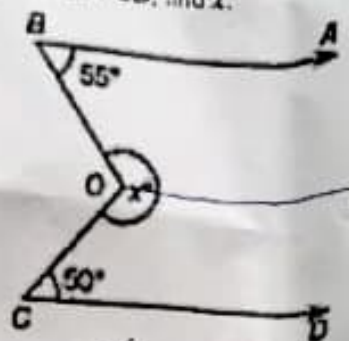
(a) 225 cm²

(b) $225\sqrt{3}$ cm²

(c) $225\sqrt{2}$ cm²

(d) 450 cm²

9. In the adjoining figure $AB \parallel CD$, find x .



(a) 255°

(b) 150°

(c) 250°

(d) 155°

10. If $a + b + c = 9$ and $ab + bc + ca = 40$, then value of $a^2 + b^2 + c^2$ is:

(a) 80

(b) 1

(c) 81

(d) 161

11. Area of ΔAOB having vertices $A(0, 6)$, $O(0, 0)$ and $B(6, 0)$ is:

(a) 12 Sq. units

(b) 36 Sq. units

(c) 18 Sq. units

(d) 24 Sq. units

12. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then the greater of the two angles is:

(a) 54°

(b) 108°

(c) 120°

(d) 136°

13. If $\Delta PQR \cong \Delta EOF$, then is it true to say that?

(a) $PR = EF$

(b) $\angle RQP = \angle FOE$

(c) Both (a) & (b)

(d) None of these

14. A public library has a fixed charge for the first two days and an additional charge for each day thereafter. Laxmi paid ₹ 25 for a book kept for 7 days. Assuming the fixed charges are ₹ x and additional charges for each day is ₹ y . Which of the following equation represent the given equation?

(a) $7x + y = 25$

(b) $x + 7y = 25$

(c) $x + 5y = 25$

(d) $7x = 25y$

15. If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$ is:

(a) 0

(b) 1

(c) $4\sqrt{2}$

(d) -1

16. Two sides of triangle are 8 cm and 11 cm and perimeter of triangle is 32 cm.

What is the value of semi-perimeter?

(a) 19

(b) 20

(c) 21.5

(d) 16

17. (2, 0) is the solution of the equation $3x + 2y = 6$ for $a = ?$

(a) -2

(b) 2

(c) 3

(d) -3

18. The value of $8\sqrt{15} + 2\sqrt{3}$ is:

(a) $8\sqrt{15}$

(b) $8\sqrt{5}$

(c) $4\sqrt{5}$

(d) $4\sqrt{15}$

Directions:

In question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option:

(a) Both, Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A).

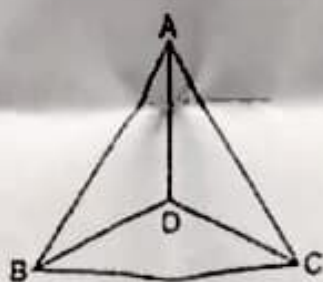
(b) Both, Assertion (A) and Reason (R) are true but Reason (R) is not correct explanation for Assertion (A).

(c) Assertion (A) is true but Reason (R) is false.

(d) Assertion (A) is false but Reason (R) is true.

19. Assertion (A): $\triangle ABC$ and $\triangle DBC$ are two isosceles triangles on the same base BC. Then, $\angle ABD = \angle ACB$.

Reason (R): In a triangle, the angles opposite to equal sides are equal.



20. Assertion (A): Degree of a zero polynomial is not defined.

Reason (R): Degree of a non-zero constant polynomial is zero.

SECTION B

This section consists of 5 questions of 2 marks each.

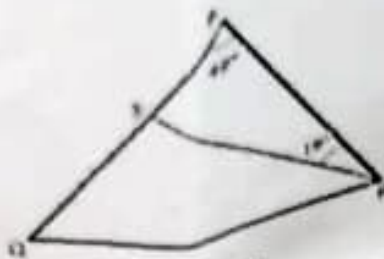
$$5 \times 2 = 10$$

21. The volume of a cube is expressed as $8x^3 + 27y^3 + 36x^2y + 54xy^2$. What is the side of the cube? $(2x + 3y)$

22. Write the coordinates of the point whose perpendicular distance from x-axis is 7 units and perpendicular distance from y-axis is 2 units and the point lies in II quadrant.

23. Express $26.333333...$ as a rational number, in form p/q where p and q are co-primes and $q \neq 0$. $\frac{79}{3}$

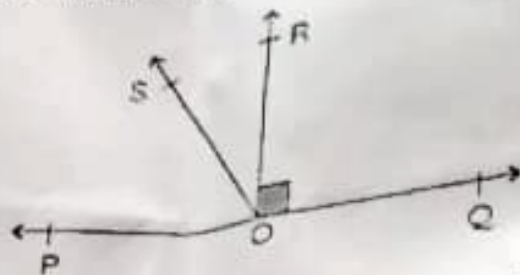
24. A. In the given figure, $PQ = QR$, $\angle QPR = 48^\circ$, $\angle SRP = 18^\circ$, then find $\angle QRS$ and $\angle PQR$.



OR

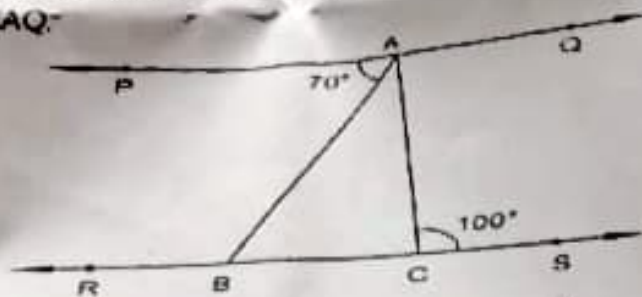
B. In $\triangle ABC$, the bisector AD of $\angle A$ is perpendicular to side BC. Prove that $\triangle ABC$ is an isosceles triangle.

25. A. In the given figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.



OR

B. In the given figure, $PQ \parallel RS$, $\angle PAB = 70^\circ$ and $\angle ACS = 100^\circ$. Determine $\angle ABC$, $\angle BAC$ and $\angle CAQ$.



SECTION C

6x3 = 18

This section consists of 6 questions of 3 marks each.

26. Find the value of $\left(\frac{64}{125}\right)^{-\frac{2}{3}} + \frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)^0$. $\frac{3}{\sqrt{2}} + 2$

27. Charity is the act of giving help to those in need. So, in this order, Radha distributed chocolates in an orphanage, on her birthday, she gave 5 chocolates to each child and 20 chocolates to adults. Taking number of children as x and total chocolates distributed as y .

(i) Write a linear equation, in standard form as $ax + by + c = 0$.

(ii) Find two solutions of this equation.

28. A. Verify that:

$$x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2].$$

OR

B. Factorize

(i) $9x^2 + 16y^2 + 4z^2 - 24xy + 16yz - 12xz$ $(-3x+4y+2z)^2$

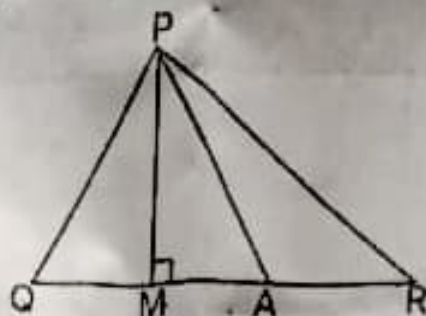
(ii) $(3x-2y)^3 + (2y-4z)^3 + (4z-3x)^3$ $3(3x-2y)(2y-4z)(4z-3x)$

29. A. Sides of a triangle are in the ratio 15:11:10 and its perimeter is 360 cm. Find its area. $1200\sqrt{3} \text{ cm}^2$

OR

B. In a rectangular field of dimensions 50m x 30m, a triangular park is constructed. If the dimensions of the park are 14m, 15m and 13m, find the area of the remaining field.

30. In the figure below, $\angle Q > \angle R$, PA is the bisector of $\angle QPR$ and $PM \perp QR$. Prove that $\angle APM = \frac{1}{2}(\angle Q - \angle R)$.



31. In the given figure, if $AB \parallel CD \parallel EF$, $PQ \parallel RS$, $\angle RQD = 25^\circ$ and $\angle CQP = 60^\circ$, then find $\angle QPS$.



$\angle QPS = 145^\circ$

SECTION D

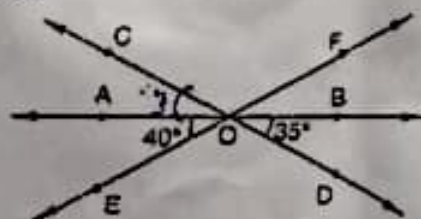
This section consists of 4 questions of 5 marks each.

$4 \times 5 = 20$

32. If $(x+2)$ and $(2x-1)$ are the factors of $2x^3 + ax^2 + bx + 10$ then find the value of 'a' and 'b'. -36 $-\frac{26}{3}$

33. (i) If two lines AB and CD intersect at O, then prove that vertically opposite angles are equal.

- (ii) In the given figure, lines AB, CD and EF intersect at O. Find the measures of $\angle AOC$ and $\angle COF$.



$\angle AOC = 35^\circ$
 $\angle COF = 125^\circ$

34. A. Simplify

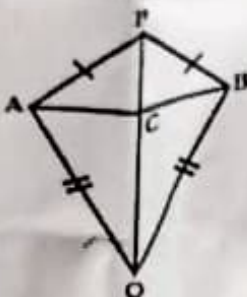
$$\frac{6}{2\sqrt{3}-\sqrt{6}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$$

OR

B. If $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ and $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$, find $x^2 + y^2$.

35. From the given figure, AB is a line-segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B. Show that:

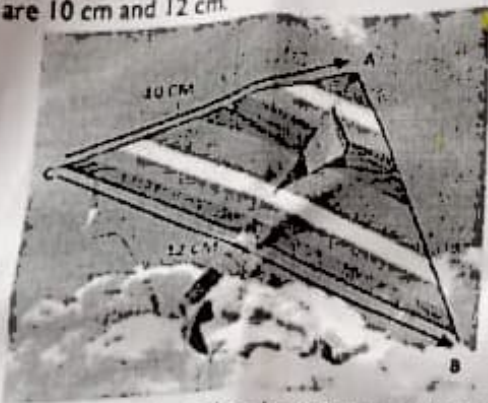
- $\triangle APQ \cong \triangle BPQ$
- $\triangle APC \cong \triangle BPC$
- PQ is the perpendicular bisector of AB.



SECTION E

This section has 3 case study-based questions carrying 4 marks each. $3 \times 4 = 12$

36. International kite festival in Gujarat also known as Uttarayan is one of the biggest festivals celebrated in Gujarat. It is celebrated on the auspicious day of Makar Sankranti every year. It is a sign for the farmers about the beginning of summer season. On the day of Uttarayan, Suresh a 16-year-old boy wants to fly kite. He ordered a triangle shape kite whose two sides are 10 cm and 12 cm.



On the basis of the above information, solve the following questions:

- Find the length of third side if the perimeter is 32 cm. $C = 10$
- Which two angles will be equal in the triangle? Give reason. $\angle A \cong \angle B$
- A. Find the area of kite. 48 cm^2

OR

B. What would have been the area of triangle if each side was 10 cm?

37. In a GPS, the lines that run east-west are known as lines of latitude, and the lines running north-south are known as lines of longitude. The latitude and the longitude of a place is its coordinates. The coordinates of the four places form a Quadrilateral, as shown in the figure. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhub (B) and Nashik (N) as shown in the given figure below.



Based on the above information answer the following questions:

- Write the coordinates of points L & P.
- If a line is drawn parallel to y-axis from point L, where will it touch x-axis?
- A. What is the sum of distances of point N from y-axis and x-axis?

OR

- B. What is the difference between the ordinates of points N and P?

38. Forests still cover about 30% of the world's land area but they are disappearing at an alarming rate. Between 1990 and 2020 the world lost more than 5,02,000 square miles of forest according to the study in the "Journal Nature". About 17% of the amazonian rainforests have been destroyed over the past 50 years. Madhuban Art gallery organized an exhibition to create awareness about afforestation. They have asked people to come with their innovative rectangular painting choosing any one of the sizes from the samples.

Sample 1:
AREA = $q^2 - 10q + 21$

Sample 2:
AREA = $p^2 - 6p - 16$

Based on the above information, answer the following questions:

- What is the degree of these polynomials?
- Is $(q - 3)$ a factor of $q^2 - 10q + 21$?
- A. What can be the possible expressions for length and breadth of Sample 1?

OR

- B. What can be the possible expressions for length and breadth of Sample 2?