



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

ANNUAL EXAMINATION- 2024-25

MATHEMATICS (041)



Class: IX
Date: – 24-02-2025
Adm No: _____

Duration: 3 Hrs
Max. Marks: 80
Roll number: _____

General Instructions:

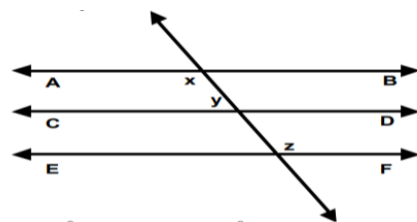
- 1 This question paper has 5 sections A, B, C, D and E.
- 2 Section A has 18 MCQs carrying 1 mark each. There are two AS Qs carrying 1 mark each.
- 3 Section B has 5 questions carrying 2 marks each.
- 4 Section C has 6 questions carrying 3 marks each.
- 5 Section D has 4 questions carrying 5 marks each
- 6 Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values 1, 1 and 2 marks each respectively.
- 7 All questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2Qs of 3 marks and 2 Qs of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
- 8 Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

SECTION – A

- 1 The representation of $1.\bar{3}$ in the form $\frac{p}{q}$ is
(A) $\frac{4}{3}$ (B) $\frac{5}{3}$ (C) $\frac{5}{4}$ (D) none of these
- 2 The value of $p(x) = 8x + 4x^2 + 3$ at $x = 1$ is
(A) -15 (B) 15 (C) 14 (D) none of these
- 3 Abscissa of a point is positive in:
(A) I and II quadrant (B) I and IV quadrant (C) I quadrant only (D) II quadrant only
- 4 If $(1, 2)$ is a solution of the linear equation $2x + 3y = k$, then the value of k is:
(A) 9 (B) 6 (C) 5 (D) 8
- 5 In the figure $AB \parallel CD$ and $CD \parallel EF$ and $y : z = 3 : 7$

then the value of x is

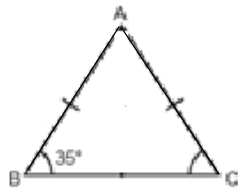
- (A) 126° (B) 120°
- (C) 58° (D) 62°



6 There are ----- number of Euclid's Postulates.

- (A) Three (B) Four (C) Five (D) Six

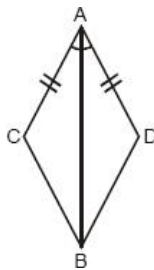
7 In the given figure, $AB = AC$, $\angle ABC = 35^\circ$ then $\angle BAC$



- (A) 35° (B) 70° (C) 110° (D) 55°

8 In the given figure, the congruency rule used in proving $\triangle ACB \cong \triangle ADB$ is

- (A) ASA (B) SAS (C) SSA (D) RHS



9 Three angles of a quadrilateral are 75° , 90° and 75° . The fourth angle is:

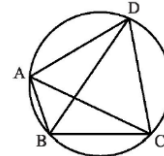
- (A) 90° (B) 95° (C) 105° (D) 120°

10 A point whose distance from the centre of a circle is greater than its radius then it lies

- (A) Interior (B) exterior (C) on boundary (D) none of these

11 In below figure, ABCD is a cyclic quadrilateral in which AC and BD are its diagonals. If $\angle DBC = 55^\circ$ and $\angle BAC = 45^\circ$, find $\angle BCD$.

- (A) 80° (B) 60°
(C) 90° (D) 100°



12 Area of an equilateral triangle of side $6\sqrt{3}\text{cm}$ is

- (A) 27 cm^2 (B) $27\sqrt{3}\text{ cm}^2$ (C) $18\sqrt{3}\text{ cm}^2$ (D) $54\sqrt{3}\text{ cm}^2$

13 The sides of a triangle are 52 cm, 56 cm and 60 cm. Its semi perimeter is

- (A) 168 cm (B) 158 cm (C) 84 cm (D) 48 cm.

14 The total surface area of a hemisphere is:

- (A) $2\pi rh$ (B) $2\pi r^2$ (C) $\frac{1}{2}\pi r^2 h$ (D) $3\pi r^2$

15 The inner diameter of circular well is 3.5 m and it is 10 m deep. Its inner curved surface area in m^2 is:

- (A) 120 m^2 (B) 110 m^2 (C) 130 m^2 (D) 140 m^2

16 The range of the data:
25, 81, 20, 22, 16, 6, 17, 15, 12, 30, 32, 10, 91, 8, 11, 20 is:

- (A) 10 (B) 75 (C) 26 (D) 85

17 Class mark of class 90-130 is

- (A) 220 (B) 110 (C) 155 (D) None of these

18 If one angle of a parallelogram is 120° , then the adjacent angle is:

- (A) 30° (B) 60° (C) 90° (D) 120.

Assertion and Reasoning questions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true and R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

19 **Assertion:** In $\triangle ABC$, $BC = AB$ and $\angle C = 50^\circ$. Then, $\angle A = 50^\circ$

Reason: In a triangle, angles opposite to two equal sides are equal

20 **Assertion:** All angles of a quadrilateral can be acute angles.

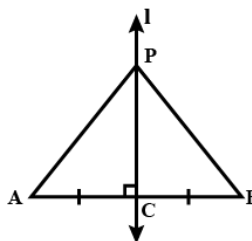
Reason: Sum of all the angles of a quadrilateral is 360°

SECTION – B

21 Factorise the polynomial: $6x^2 + 5x - 6$.

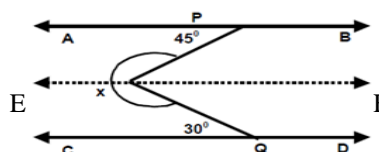
22. If a point C lies between two points A and B such that $AC = BC$, then prove that $AC = \frac{1}{2} AB$. Explain with suitable diagram.

23 AB is a line segment and line l is its Perpendicular bisector. If a point P lies on l , Show that P is equidistant from A and B.



OR

Find the value of x, from the following figure,
 $AB \parallel EF \parallel CD$



- 24 Prove that the diagonals of a parallelogram bisect each other.
 25 Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find the radius of the base .

OR

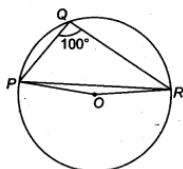
Find the total surface area of a hemisphere of radius 10 cm.

SECTION – C

- 26 Rationalise the denominator and simplify: $\frac{5+\sqrt{6}}{5-\sqrt{6}}$
 27 Find SIX solution of $2x + y = 5$
 28 Use suitable identity and simplify: i) $(x + 4)(x + 10)$ ii) $(y^2 + \frac{3}{2})(y^2 - \frac{3}{2})$
 29 Plot these points on graph paper: A (-2 , 4) , B (-2 , -3) , C (4 , -3) , D (4 , 4)
 Join AB, BC, CD and DA. Name the so obtained figure.
 30 Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

OR

In the following figure , $\angle PQR = 100^\circ$, where P, Q and R are points on a circle with centre O.
 Find $\angle OPR$.

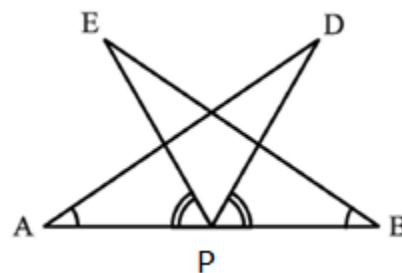


- 31 Construct a frequency polygon for the following data.

Age (years)	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	7	10	14	20	16	8	2

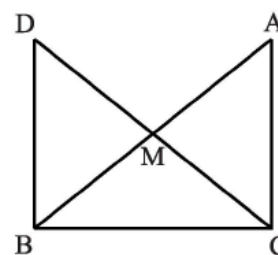
SECTION – D

- 32 AB is a line segment and P is its midpoint. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (refer figure given below).
 Show that (i) $\triangle DAP \cong \triangle EBP$ and (ii) $AD = BE$.

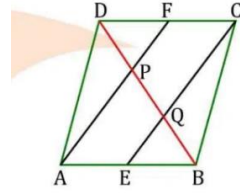


OR

In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that $DM = CM$. Point D is joined to point B (refer the figure). Show that
 (i) $\triangle AMC \cong \triangle BMD$ (ii) $\angle DBC = 90^\circ$
 (iii) $\triangle DBC \cong \triangle ACB$ (iv) $CM = \frac{1}{2}AB$



33. In a parallelogram ABCD, E and F are the mid points of sides AB and CD. Show that The line segments AF and EC trisect the diagonal BD.



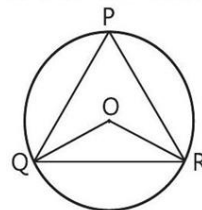
34. There is a slide in a park. One of its side Company hired one of its walls for 3 months. Walls has been painted in some colour with a message “KEEP THE PARK GREEN AND CLEAN”. If the sides of the wall are 15 m, 11 m and 6m, find the area painted in colour
35. A conical tent is 10 m high, and the radius of its base is 24 m. Find
 (i) Slant height of the tent.
 (ii) Cost of the canvas required to make the tent, if the cost of 1 m² canvas is Rs 70.

OR

A joker’s cap is in the form of a right circular cone with a base radius of 7 cm and a height of 24cm. Find the area of the sheet required to make 10 such caps.

SECTION – E

36. Government of India is working regularly for the growth of handicapped persons. For these three STD booths situated at point P, Q and R are as shown in the figure, which are operated by handicapped persons. These three booths are equidistant from each other as shown in the figure.



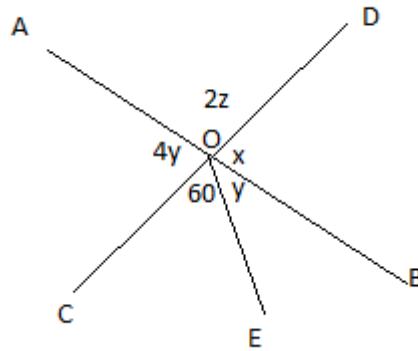
On the basis of the above information, solve the following questions:

- | | |
|--|---|
| 1. Which type of ΔPQR in the given figure? | 1 |
| 2. Measure angle $\angle QOR$. | 1 |
| 3. Find the value of $\angle OQR$. | 2 |

OR

Find $\angle PQR$.

37 Maths teacher draws a straight line AB shown on the blackboard as per the following figure.



Now he told Raju to draw another line CD as in the figure

The teacher told Ajay to mark $\angle AOD$ as $2z$

Suraj was told to mark $\angle AOC$ as $4y$

Clive Made and angle $\angle COE = 60^\circ$

Peter marked $\angle BOE$ and $\angle BOD$ as y and x respectively

Now answer the following questions:

1. What is the value of y ? 2
 OR
 What is the value of x ?
2. Find the value of z ? 1
3. What should be the value of $x + z$? 1

38 . A group of students decided to make a project on Statistics. They are collecting the heights (in cm) of their 51 girls of Class IX-A, B and C of their school. After collecting the data, they arranged the data in the following frequency distribution table form:



Height (in cm)	Number of girls
135 - 140	4
140 - 145	7
145 - 150	18
150 - 155	11
155 - 160	6
160 - 165	5

Based on the information, answer the following questions:

1. Write the class interval with highest frequency. 1
2. What is the width of the class? 1
3. How many students of the height 150 cm and below are there? 2

OR

How many students of the height 145 cm and above are there?
