CARMEL CONVENT SCHOOL, CHANDIGARH
FINAL EXAMINATION - SESSION 2024-25
MATHEMATICS

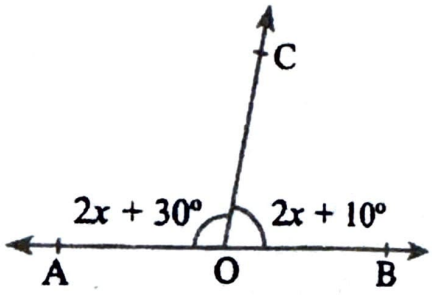
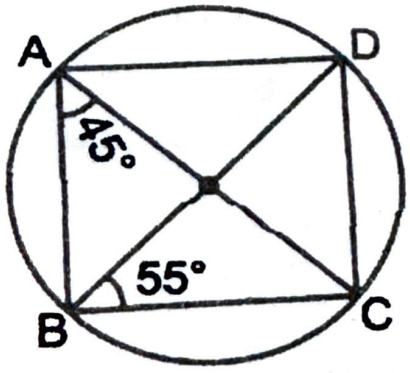
CLASS: 9 **TOTAL MARKS: 80**
DATE: 7.03.25 **TIME: 3 HOURS**

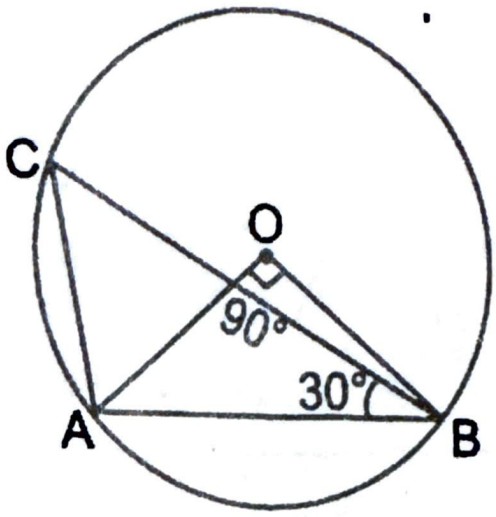
General Instructions:

(i) All questions are compulsory.
(ii) There are 3 questions in the paper.
(iii) The question paper has five sections: A, B, C, D and E.
Section–A has 20 questions (Q1 to 20) of 1 mark each.
Section–B has 5 questions (Q21 to 25) of 2 marks each.
Section–C has 6 questions (Q26 to 31) of 3 marks each.
Section D has 4 questions (Q32 and 35) of 5 marks each.
Section–E has 3 Case Study questions (Q36 to 38) of 4 marks each.
(iv) All questions are compulsory .
(v) Draw neat figures wherever required.

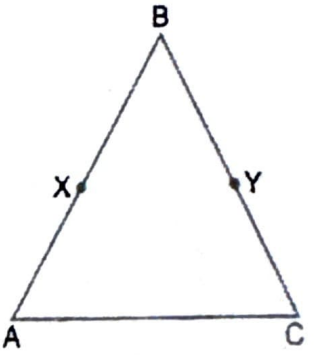
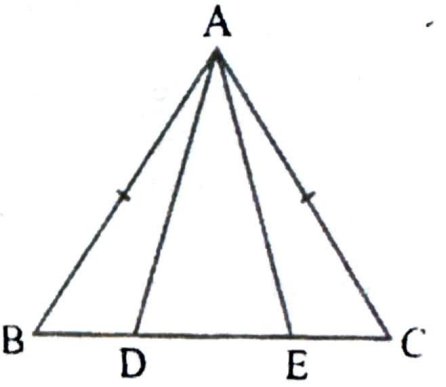
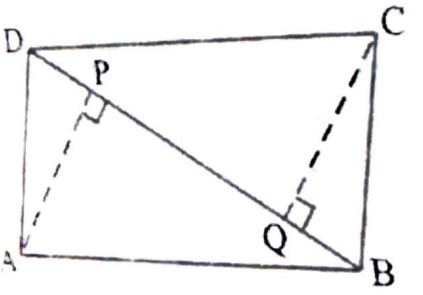
SECTION A

Q. No.	Question	Marks
1	A rational number between $\sqrt{2}$ and $\sqrt{3}$ is a) 1.1 b) $\frac{\sqrt{2}.\sqrt{3}}{2}$ c) 1.5 d) 1.8	1
2	The value of $(125)^{-1/3}$ a) 1/2 b) 1/8 c) 1/5 d) 2/5	1
3	If the area of rectangle is $4X^2 + 4X - 3$, then its possible dimensions are a) (2X- 3) (2X + 1) b) (2X+ 3) (2X - 1) c) (2X- 3) (3X + 1) d) (2X+ 3) (3X -1)	1
4	If $a+ b + c = 0$, then the value of $a^3 + b^3 + c^3$ is a) abc b) -3abc c) 0 d) 3abc	1
5	The points (2,4) lies in which quadrant a) I quadrant b) II quadrant c) III quadrant d) IV quadrant	1
6	The graph of linear equation $y = 2x$ passes through the point a) (2 , 1) b) (2 , - 1) c) (3/2, -3) d) (3/2, 3)	1
7	If (2 , 0) is a solution of linear equation $2x + 3y = k$, then the value of k is a) 4 b) 6 c) 5 d) 2	1
8	In triangles ABC and DEF, AB = FD and $\angle A = \angle D$. The two triangles will be congruent by SAS congruence if a) BC = EF b) AC = DE c) AC = EF d) BC = DE	1

9	In a parallelogram, what is the sum of its two adjacent angles, a) 90° b) 135° c) 180° d) 270°	1
10	In the given figure, if AOB is straight line, then ∠ BOC is  a) 80° b) 70° c) 60° d) 35°	1
11	Reflex angle of 110° a) 70° b) 90° c) 250° d) 190°	1
12	Area of the right angled triangle is equal to a) Base × Height b) 2(Base × Height) c) ½ (Base × Height) d) ½ (Base + Height)	1
13	The class marks for the class 90 - 130 a) 90 b) 105 c) 115 d) 110	1
14	In a group frequency data class intervals are 1 - 20, 21 - 40, 41 - 60, ... then the class size is a) 10.5 b) 30.5 c) 19 d) 20	1
15	In the given fig , ∠ DBC = 55°, ∠ BAC = 45°, then ∠ BCD is  a) 45° b) 55° c) 100° d) 80°	1

16	In figure, ∠ AOB =90° ∠ABC = 30°, then ∠ CAO is equal to  a) 30° b) 45° c) 90° d) 60°	1
17	The curved surface area of a hemisphere of radius R a) $2\pi r^2$ b) $3\pi r^2$ c) $4\pi r^2$ d) $6\pi r^2$	1
18	For every line l and a point, P, not lying on it, the number of lines that passes through P and parallel to l are a) 2 b) 1 c) no line d) 3	1
19	In Q19 and Q20 , 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 the correct explanation of assertion (A) b) Both assertion(A) and reason (R) are true and 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 Assertion(A): If the diagonals of a parallelogram, ABCD are equal, then ∠ ABC = 90° Reason (A): If the diagonals of a parallelogram are equal, then the figure obtained can only be a rectangle.	1
20	Assertion(A): If the height of the cone is 24 cm and diameter of the base is 14 cm, then the slant height is 15 cm. Reason (A): If 'r' is the radius and 'h' is the height of the cone, then the slant height $= \sqrt{h^2 + r^2}$	1

SECTION – B

Q. No.	Question	Marks
21	In the given figure if BX = ½ AB , BY = ½ BC and AB = BC , Using Euclid Axiom show that BX = BY 	2
22	Express $0.7\overline{25}$ in the form of p/q.	2
23	In an Isosceles Δ ABC with AB = AC, D and E are the points on BC such that BE = CD. Show that AD = AE 	2
24	ABCD is a parallelogram and AP and CQ are perpendicular from vertices, A and C on diagonal BD.  Show that i) ΔAPB congruent to ΔCQD ii) AP= CQ	2

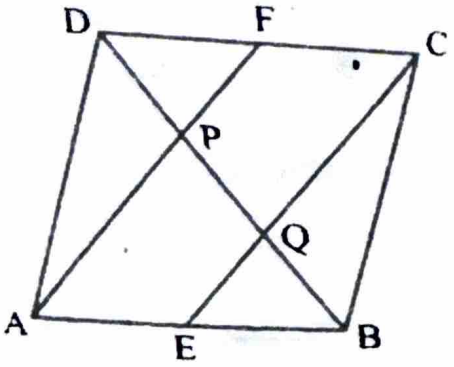
25	In a conical tent of radius 8.4 m and vertical height 3.5 m, how many full bags of wheat can be emptied if space for the wheat in each bag is 1.96 m^3?	2

SECTION – C

Q. No.	Question	Marks
26	Factorise $x^3 - 23x^2 + 142x - 120$	3
27	Express the following linear equation $x(x + 2) - x^2 + y(y - 3) - y^2 = 0$ in the form of $ax + by + c = 0$ And hence write the values of a , b and c.	3
28	Factorise $3x^2 + 4y^2 + 25z^2 - 4\sqrt{3}xy - 20yz + 10\sqrt{3}zx$	3
29	ABC and DBC are two triangles on the same base, BC, such that A and D lie on the opposite sides of BC, AB = AC and DB = DC. Show that AD is the perpendicular bisector of BC.	3
30	Prove that the quadrilateral formed by the internal angle bisectors of any quadrilateral is cyclic.	3
31	Three girls Reshma, Salma and Mandeep are playing a game by standing on a circle of radius 5 m drawn in a park. Reshma throws a ball to Salma, Salma to Mandeep, Mandeep to Reshma. If the distance between Reshma and Salma and between Salma and Mandeep is 6 m each, what is the distance between Reshma and Mandeep?	3

SECTION – D

Q. No.	Question	Marks
32	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 $x^2 + y^2$	5
33	State and prove converse of Midpoint theorem. Hence prove the following : In a parallelogram, ABCD, E and F are the midpoints of sides, AB and CD respectively. Show that line segments AF and EC trisect the diagonal BD.	5



34 The runs scored by two teams, A and B on the first 60 balls in a cricket match are given below. 5

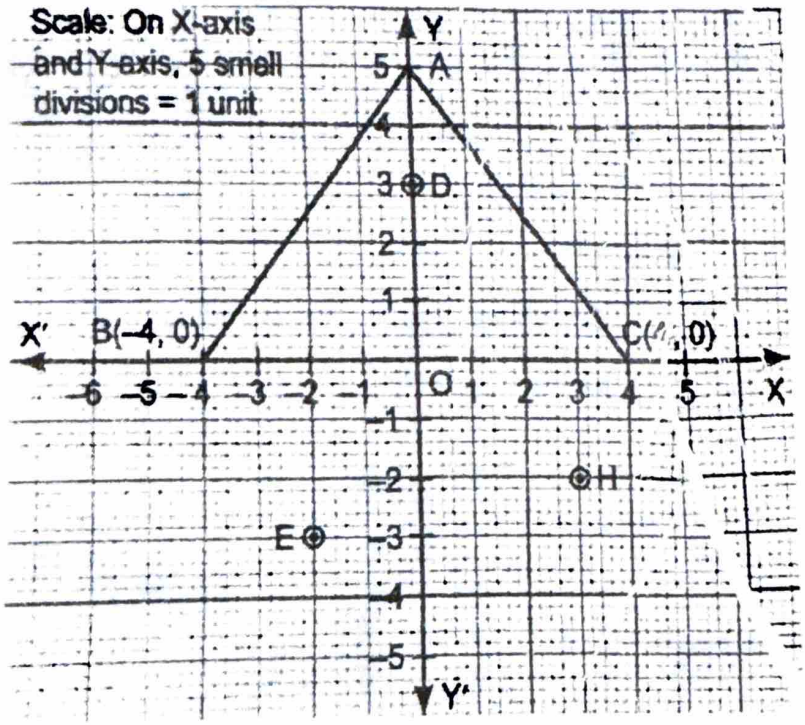
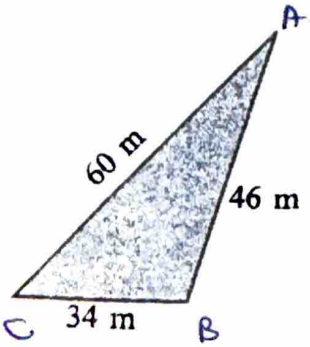
Number of balls	Team A	Team B
1 - 6	2	5
7-12	1	6
13 -18	8	2
19 - 24	9	10
25 - 30	4	5
31 - 36	5	6
37 - 42	6	3
43 - 48	10	4
49 - 54	6	8
55 - 60	2	10

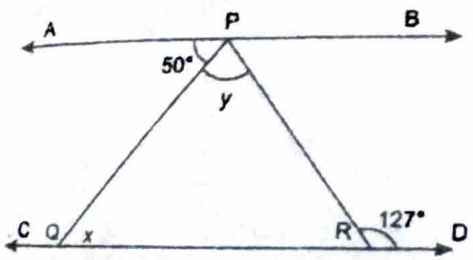
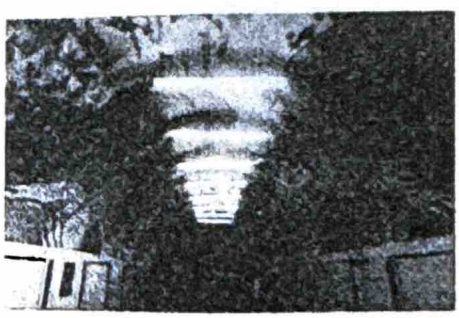
Represent the data of both the teams on the same graph by frequency polygon.

35 The volumes of two spheres are in the ratio of 64 : 27. Find their radii, if the sum of their radii is 21 cm. 5

Section E

Question number 36 to 38 are case based questions. Each question has three sub parts.

Q. No.	Question	Marks
36	Observe the given figure and answer the following questions:  i) Name the point whose coordinates are (-2 ,-3) ii) What is the abscissa of point D. iii) Calculate area of Δ ABC.	4 (1+1+2)
37	A playground is made in the shape of a triangle. The dimensions of triangular playground are 34 m * 46 m * 60 m. The city Municipal Corporation decided to level the ground, the cost of leveling , the ground is ₹1000 per square metre.  Based on this information, answer the following questions	4 (1+1+2)

	i) If the playground is to be fenced with the wire, find the length of the wire ii) If the playground was an equilateral triangle with side 60 m, then find its area iii) Find the cost of leveling the triangular ground whose dimensions are 34 m * 46 m * 60 m . (Take $\sqrt{42} = 6.48$)	
38	An underpass road is constructed in a tunnel shape, whose cross-section is in the form of a triangle. In the figure AB is the roof of the underpass and CD is the ground level. The lines AB and CD are parallel to each other. Δ PQR is the face of the cross-section of the underpass. Also, ∠ APQ measures 50° and ∠ PRD measures 127°.   Based on the above information and the given figure, answer the following questions i) What is the value of x? ii) What is the value of y? iii) What is the measure of ∠ BPR + ∠ PQC ?	4 (1+1+ 2)

'The End"'