

CARMEL CONVENT SCHOOL, CHANDIGARH
PRE BOARD EXAMINATION (2025-2026)
MATHEMATICS

CLASS: X

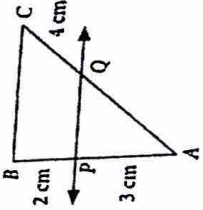
DATE: 03.12.2025

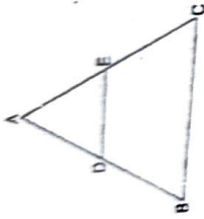
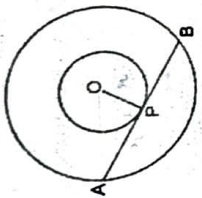
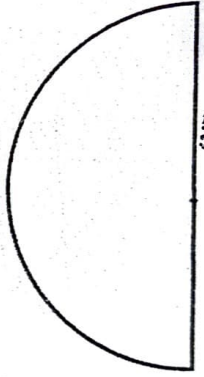
General Instructions:

TOTAL MARKS: 80
TIME: 3 HOURS

- (i) All questions are compulsory.
- (ii) There are 38 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) There is no overall choice. However, Internal choices have been provided in some questions. Student must attempt only one of the alternatives in such questions.
- (v) Draw neat figures wherever required.
- (vi) Use $\pi = 22/7$, if not mentioned in the question.

SECTION A

Q. No.	Question	Marks
1	If LCM $(x, 12) = 6$ and HCF $(x, 12) = 2$, then x is a) -1 b) 3 c) 2 d) 5	1
2	If α and β are zeros of $5x^2 + 3x - 7$ what is the value $1/\alpha + 1/\beta$ a) $-3/7$ b) $3/5$ c) $3/7$ d) $-5/7$	1
3	The linear equation $2x + 3y - 6 = 0$ intersect $y = 0$ at a) $(6, 0)$ b) $(2, 0)$ c) $(0, 0)$ d) $(3, 0)$	1
4	The value of α for which the following pair of linear equations have infinitely many solutions is $5x - 6y = 7$; $ay - 15x + 21 = 0$ a) -8 b) -12 c) -8 or -12 d) -18	1
5	If the quadratic equations $ax^2 + bx + c = 0$, has equal roots, then the value of a is a) $b^2 / 4c$ b) $-b^2 / 4c$ c) $b / 2c$ d) $-b / 2c$	1
6	If the sum of n terms of an AP is $S_n = 3n^2 + 4n$ then the common difference of the given AP is a) 6 b) 3 c) 4 d) 8	1
7	In the given figure, if $PQ \parallel BC$, then the length of AQ is  a) 3.5 cm b) 6 cm c) 9 cm d) 9.5 cm	1

8	In $\triangle ABC$, $DE \parallel BC$ where D and E are the points on AB and AC respectively, then :  a) $\frac{AB}{AD} = \frac{AC}{AE}$ * b) $\frac{AD}{DB} = \frac{DE}{BC}$ c) $\frac{AD}{DB} = \frac{EC}{AE}$ d) $\frac{AB}{AD} = \frac{DE}{BC}$	1
9	In the given figure, AB is the chord of a larger circle, touching the smaller circle. The centre of both the circles is O. If $AB = 2r$ and $OP = r$, then the radius of the larger circle. 	1
10	a) $2r$ b) $3r$ c) $2\sqrt{2}r$ d) $\sqrt{2}r$ If two tangents are inclined at an angle 60° to a circle of radius 3 cm, then length of each tangent is equal to a) $\frac{3}{2}\sqrt{3}\text{ cm}$ b) 6 cm c) 3 cm d) $3\sqrt{3}\text{ cm}$	1
11	The ratio in which the X axis divides the line segment joining the points $(-2, 3)$ and $(6, -7)$ is a) $1:3$ b) $3:7$ c) $7:3$ d) $1:2$	1
12	Which of the following statement is true a) $\sin 20^\circ > \sin 70^\circ$ b) $\sin 20^\circ > \cos 20^\circ$ c) $\cos 20^\circ > \cos 70^\circ$ d) $\tan 20^\circ > \tan 70^\circ$	
13	If 6 m pole casts a shadow $2\sqrt{3}\text{ m}$ long on the ground then the sun's elevation is a) 60° b) 45° c) 30° d) 90°	1
14	If a sector of a circle has an area of 40π square units and a central angle of 72°, the radius of the circle is a) 200 units b) 100 units c) 20 units d) $10\sqrt{2}\text{ units}$	1
15	In the given figure, the shape of the top of a table is semicircular with radius 63 cm. Then the perimeter of the top of the table is 	1
	a) 198 cm b) 324 cm c) 126 cm d) 252 cm	

16	2 cards of hearts and 4 cards of spades are missing from a pack of 52 cards. A card is drawn at random from the remaining pack. The probability of getting a black card is a) $\frac{22}{52}$ b) $\frac{22}{46}$ c) $\frac{24}{52}$ d) $\frac{24}{46}$	1												
17	Two identical solid cubes of side 'a' are joined end to end. The total surface area of the resulting cuboid is a) $6a^2$ b) $10a^2$ c) $5a^2$ d) $4a^2$	1												
18	The difference between upper limit and lower limit of the modal class for the given distribution is <table border="1"> <tr> <td>Class</td> <td>0 - 10</td> <td>10 - 20</td> <td>20 - 30</td> <td>30 - 40</td> <td>40 - 50</td> </tr> <tr> <td>Frequency</td> <td>3</td> <td>8</td> <td>11</td> <td>9</td> <td>7</td> </tr> </table>	Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	Frequency	3	8	11	9	7	1
Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50									
Frequency	3	8	11	9	7									
19	a) 9 b) 25 c) -10 d) 5 In this question, 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: If we join two hemispheres of the same radius along their bases , then we get a sphere Reason: Total surface area of a sphere of radius r is $3\pi r^2$	1												
20	In this question, 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 Assertions : The LCM of the smallest prime number and smallest odd composite number is 18 ✓ Reason: LCM is the product of <u>greatest power of each prime factor</u> of the given <u>numbers</u> .	1												

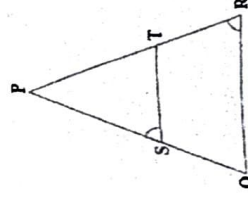
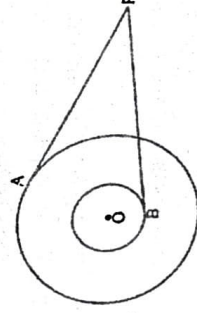
SECTION - B

Q. No.	Question	Marks
21	On the morning walk, three persons step up together and their steps measured 40 cm, 42 cm and 45 cm respectively. What is the <u>minimum distance</u> each should walk so that each can cover the same <u>distance</u> in complete steps?	2
22	If $\frac{7}{5}$ and -3 are the zeros of the polynomial $ax^2 + 7x + b$ then find the values of a and b. OR Find the zeros of a quadratic polynomial $2x^2 - (1 + 2\sqrt{2})x + \sqrt{2}$ and verify the relationship between zeros and coefficient of the polynomial.	2

23	Find two consecutive positive integers, sum of whose squares is 365. OR Find the discriminant of the equation $3x^2 - 2x + 1/3$ and hence find the nature of its roots. Find them, if they are real.	2
24	Evaluate the following $\frac{3\sin 30^\circ - 4\sin^3 30^\circ}{2\sin^2 50^\circ + 2\cos^2 50^\circ}$	2
25	If $\sin\theta - \cos\theta = 0$, then find the value of $\sin^4\theta + \cos^4\theta$	2

SECTION - C

Q. No.	Question	Marks
26	200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are there in the top row?	3
27	If $\cot\theta = \frac{8}{15}$, then evaluate $\frac{\sin^2\theta - \cos^2\theta}{2\sin\theta\cos\theta}$ OR If $\sin\theta + \cos\theta = \sqrt{3}$, then prove that $\tan\theta + \cot\theta = 1$	3
28	$\triangle ABC$ is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact are of lengths 8 cm and 6 cm respectively. Find the perimeter of $\triangle ABC$. OR There are two concentric circles with centre O and radii 10 cm and 4 cm. From an external point P, tangent PA and PB are drawn to both the circles as shown in the figure. If AP = 24 cm, find the length of BP.	3
29	In figure, $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$.	3
30	Prove that PQR is an isosceles triangle. On a particular day, Vidhi and Unnati couldn't decide on who would get to drive the car. They had one coin each and flipped their coin exactly 3 times. The following was agreed upon. 1. If Vidhi gets two Heads in a row, she would drive the car. 2. If Unnati gets Tail followed by Head, she would drive the car.	3



31	Who had greater probability to drive the car that day? Justify your answer.	3
	In a circle of radius 21 cm, an arc subtends, an angle of 60° at the centre, find	
	1. The length of the arc.	
	2. Area of sector formed by the arc.	
	3. Area of segment formed by the corresponding chord.	

SECTION - D

Q. No.	Question	Marks
32	The largest possible sphere is carved out of a wooden solid cube of side 7 cm. Find the volume of the wood left. OR A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and diameter of the base is 4 cm. Determine the volume of the toy. If the right circular cylinder circumscribes the toy, find the difference of volume of cylinder and the toy. (use $\pi = 3.14$)	5
33	Sides AB and AC and median AD of $\triangle ABC$ are respectively proportional to sides, PQ and PR and median PM of $\triangle PQR$. Show that $\triangle ABC \sim \triangle PQR$	5
34	Solve the following system of linear equations graphically $5x - y - 5 = 0$ $3x = y + 3$ Also, determine the coordinates of the triangle formed by these lines and the Y axis. OR Anita travels 150 km to Delhi, partly by train and partly by bus. She takes two hours, if she travels 30 km by train and the remaining distance by bus. If she travels 50 km by train and the remaining distance by bus, she takes five minutes longer. Find the speed of the train and of the bus separately.	5
35	If the median of the following distribution is 46, find the missing frequencies, p and q :	5

Class interval	Frequency
0 - 10	12
10 - 20	30
20 - 30	p
30 - 40	65
40 - 50	q
50 - 60	25
60 - 70	18
Total	230

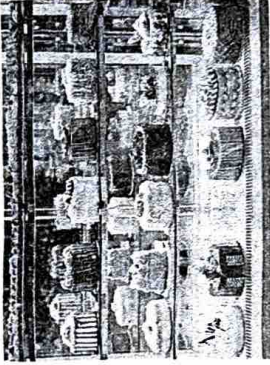
OR

Height (cm)	Number of girls
Less than 140	04
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

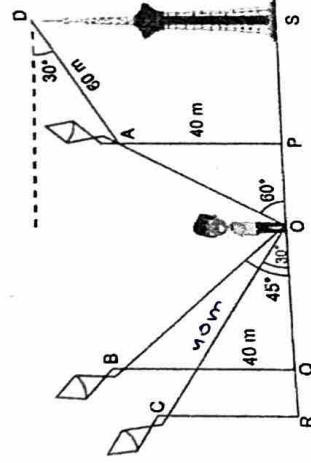
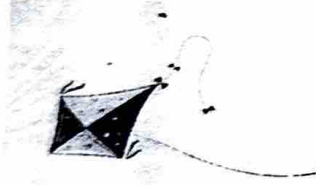
Find the median height of the girls. If the mode of the above distribution is 148.05, find the mean.

SECTION E

Question number 36 to 38 are Case based questions. Each question has three sub parts with internal choice in one sub part.

Q. No.	Question	Marks
36	Arjun starts a new bakery shop . To display the cakes , he wants to put <u>3</u> cakes in 1st row , <u>5</u> cakes in the 2nd row , <u>7</u> cakes in the 3rd row and so on .  On the basis of the above information , answer the following questions: - Find the difference between the number of cakes in the <u>17th</u> row and <u>10th</u> row. - Arjun arranges <u>X</u> cakes in 15 rows, then find the value of X. - If he arranges a total of <u>120</u> cakes, then how <u>many</u> rows are required? OR - Find the total number of cakes in the fifth and eight rows . Also find the cakes in the 30th row.	4 (1,1,2)
37	The international kite festival takes place every year on 14th January. The main attractions of the festival include National and International kite flyers, parade, kite flying, traditional stalls, etc. On this day, a few kite flyers had assembled at a point on the ground. The position of three kites, A, B, C was such that A and B were at the same vertical height of 40 m from the ground level. The angle of elevation of A, B and C from O were 60° , 45° and 30°	4 (1,1,2)

respectively. A vertical tower, SD has been erected at point S and a camera is set at the top of the tower for photography.



Based on the information given above, answer the following questions

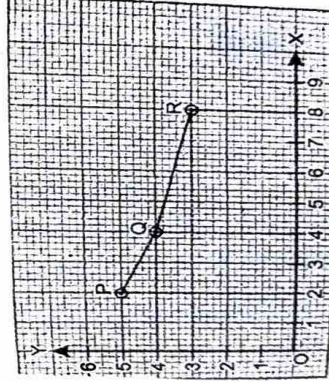
1. What is the length of the string of the kite at A?
2. If the length of the string of kite at C is 40 m, then find the height of kite C from the ground.
3. What is the horizontal distance between the kites at A and B?

OR

3. If the angle of depression of the kite at A is 30° from the camera at D and the distance between A and D is 60 m, then find the height of the tower

38

A group of class 10 students goes on a picnic during winter holidays. The position of three of the friends are shown by the points P, Q and R.



1. Find the distance between P and R.
 2. Is Q the midpoint of PR? Justify by finding the midpoint of PR.
 3. Find the point on the X axis which is equidistant from P and Q.
- OR
3. Let S be the point which divides the line joining PQ in the ratio of 2:3. Find the coordinate of S.

4

(1,1,2)

'The End'