2025_26_PRE_I

EDUTECH ACADEMY
NURTURING THE FUTURE....

SET : 01

— SCHOOL SECTION —

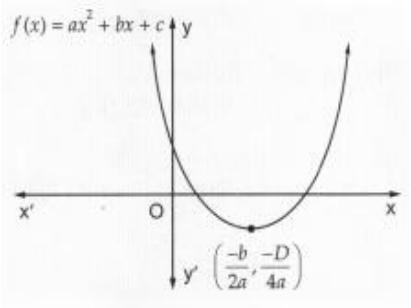
STD : X CBSE | **PRE EXAM – I** | **TIME : 3:00 Hrs**

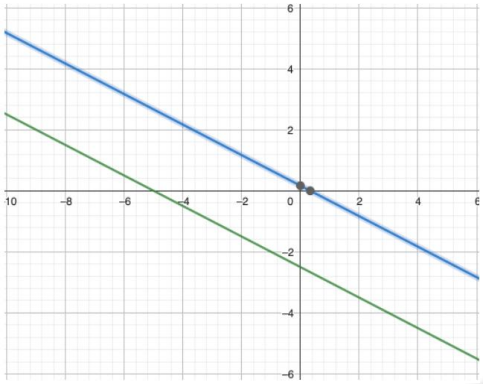
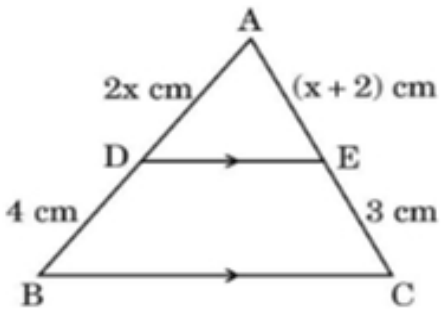
SUB : MATHS (041) | **DATE : 1st December, 2025** | **MM :80**

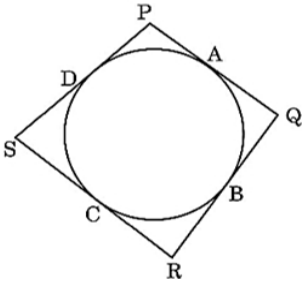
General Instructions:

Read the following instructions carefully and follow them:

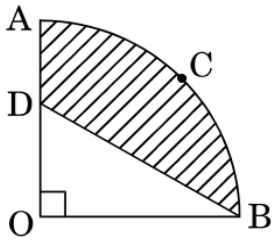
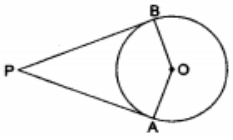
1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1 - 18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. In Section B, Questions no. 21 - 25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26 - 31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32 - 35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36 - 38 are case study - based questions carrying 4 marks each with sub - parts of the values of 1,1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Questions of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take$\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

	Section A	
1	$2\sqrt{3}$ is a) a whole number b) an irrational number c) an integer d) a rational number	**[1]**
2	Figure show the graph of the polynomialf(x) =ax^2 +bx+cfor which 	**[1]**

	a) a >0,b< 0 and c > 0 b) a< 0,b< 0 and c < 0 c) a> 0,b> 0 and c < 0 d) a< 0,b> 0 and c > 0	
3	The pair of equations x + 2y + 5 = 0 and –3x – 6y + 1 = 0 have  a) exactly two solutions b) a unique solution c) no solution d) infinitely many solutions	**[1]**
4	Which of the following equations has the sum of its roots as 3? a) $-x^2 + 3x - 3 = 0$ b) $3x^2 - 3x + 3 = 0$ c) $2x^2 - 3x + 6 = 0$ d) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0$	**[1]**
5	If 18th and 11th terms of an A.P. are in the ratio 3 : 2, then its 21st and 5th terms are in the ratio a) 3 : 1 b) 3 : 2 c) 1 : 3 d) 2 : 3	**[1]**
6	The distance of the point (- 6, 8) from x - axis is a) 6 units b) 10 units c) - 6 units d) 8 units	**[1]**
7	The fourth vertex D of a parallelogram ABCD whose three vertices are A (- 2, 3), B (6, 7) and C (8, 3) is a) (0, 1) b) (1, 0) c) (–1, 0) d) (0, - 1)	**[1]**
8	In the given figure, in△ ABC, DE ||BC.If AD = 2x cm, AE = (x + 2)cm, DB = 4 cm, EC = 3 cm, then the value of x is:  a) 3 b) 4 c) 2 d) 6	**[1]**

9	In the given figure, the quadrilateral PQRS circumscribes a circle. Here PA + CS is equal to:  a) PR b) QR c) PQ d) PS	**[1]**
10	AP and PQ are tangents drawn from a point A to a circle with centre O and radius 9 cm.If OA = 15 cm, then AP + AQ = a) 18 cm b) 12 cm c) 36 cm d) 24 cm	**[1]**
11	If sinA + $\sin^2$ A = 1, then the value of the expression ($\cos^2$ A + $\cos^4$ A) is a) 2 b) 3 c) 1 d) $\frac{1}{2}$	**[1]**
12	If sec$\theta = \frac{25}{7}$ then sin θ = ? a) $\frac{24}{7}$ b) $\frac{7}{24}$ c) $\frac{24}{25}$ d) $\frac{23}{25}$	**[1]**
13	A tower and a building standing on the ground are 20 m apart. The height of the tower is 2 times the height of the building. If at the mid - point of the line joining their feet, the angular elevation of their tops are complementary, then the height of the building is a) $\frac{2}{\sqrt{2}}$ m b) $5\sqrt{2}$ m c) $\sqrt{2}$ m d) $\sqrt{3}$ m	**[1]**
14	The difference of the areas of a minor sector of angle 120^o and its corresponding major sector of a circle of radius 21 cm, is a) 346.5 cm^2 b) 231 cm^2 c) 462 cm^2 d) 693 cm^2	**[1]**
15	Find the area of the sector if the radius is 5 cm and with an angle of 50^o . a) 13.90 cm b) 11.90 cm c) 12.90 cm d) 10.90 cm	**[1]**
16	A number is selected at random from 1 to 75. The probability that it is a perfect square is a) $\frac{8}{75}$ b) $\frac{6}{75}$ c) $\frac{10}{75}$ d) $\frac{4}{75}$	**[1]**
17	A bag contains 5 red balls and n green balls. If the probability of drawing a green ball is three times that of a red ball, then the value of n is: a) 18 b) 10 c) 15 d) 20	**[1]**

18	In the formula $\bar{X}$ = a + h $\left(\frac{1}{N}\sum f_i u_i\right)$ for finding the mean of grouped frequency distribution u $_i$ = a) h(x_i - a) b) $\frac{x_i+a}{h}$ c) $\frac{x_i-a}{h}$ d) $\frac{x_i+a}{2h}$	**[1]**
19	**Assertion (A):** A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. By measuring the amount of water is holds, a child finds its volume to be 345 cm ^{3} . **Reason (R):** To calculate the volume of vessel the expression used here is v = π r ^{2} h + $\frac{4}{3}\pi r^3$. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
20	**Assertion (A):** Common difference of the AP - 5, - 1, 3, 7, ... is 4. **Reason (R):** Common difference of the AP a, a + d, a + 2d, ... is given by d = 2nd term - 1st term. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
	Section B	
21	Prove that 6 - $\sqrt{7}$ is irrational number, given that $\sqrt{7}$ is an irrational number. **OR** Show that$5 - 2\sqrt{3}$ is an irrational number.	**[2]**
22	In a$\triangle ABC$, AD is the bisector of $\angle A$, meeting side BC at D.If AB = 5.6 cm, AC = 6 cm and DC = 3 cm, find BC.	**[2]**
23	A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC	**[2]**
24	Evaluate$\frac{\sin 60^\circ}{\cos^2 45^\circ} - \cot 30^\circ + 15\cos 90^\circ$. **OR**	**[2]**

	Prove the trigonometric identity: $\frac{\tan\theta}{(1-\cot\theta)} + \frac{\cot\theta}{(1-\tan\theta)} = (1 + \sec\theta cosec\theta)$	
25	In Figure, OACB is a quadrant of a circle with centre O and radius 7 cm. If OD = 3 cm, then find the area of the shaded region.  	**[2]**
	Section C	
26	Mrs. Gupta arranged some snacks for her child's birthday party. After the guest left she hadsome food left over. Shedid not want to waste food and so she contacted a local NGO. Shegave 60pieces of pastries,168pieces of cookies, and 330chocolate bars to the team. Now the NGO workers wantto make the maximum number of packets with those foods so that no food is left for distributing to the beggars at the roadside. Find the greatest number of packets that theycan make.	**[3]**
27	Find the zeros of $p(x) = x^2 + 2\sqrt{2}x - 6$ and verify the relationship between the zeros and its coefficients.	**[3]**
28	Calculate the mean of the following distribution: Class: 10-30 | 30-50 | 50-70 | 70-90 | 90-110 Frequency: 15 | 18 | 25 | 10 | 2	**[3]**
29	Solve the pair of linear equations x + y = 14 and x – y = 4 by substitution method. **OR** Two years agofather was five times as old as his son. Two years later, his age will be 8 years more than three times the age of the son. Find the present ages of father and son.	**[3]**
30	Prove the following identity : $\frac{1}{\cot^2\theta} + \frac{1}{1+\tan^2\theta} = \frac{1}{1-\sin^2\theta} - \frac{1}{cosec^2\theta}$	**[3]**
31	Find the locus of the centres of circles which touch a given line at a given point. **OR** In the given figure, PA and PB are the tangent segments to a circle with centre O. Show that the points A, O, B and P are concyclic.  	**[3]**

	Section D	
32	An incomplete distribution is given below: | Variable	10-20	20-30	30-40	40-50	50-60	60-70	70-80
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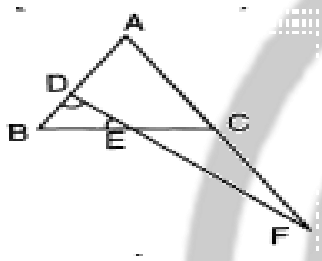
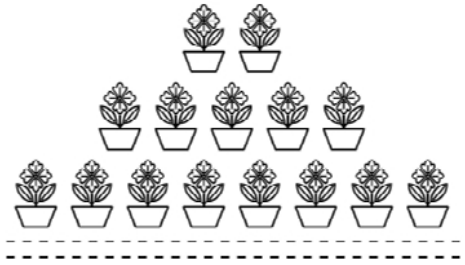
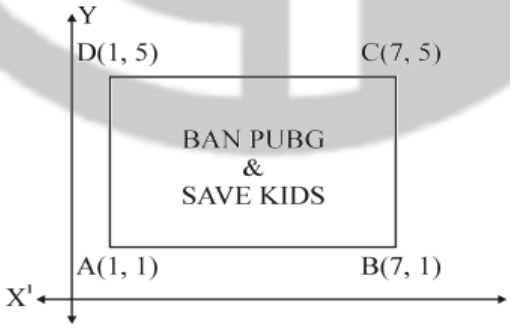
Frequency	12	30	-	65	-	25	18 | You are given that the median value is 46 and the total number of items is 230. 1. Using the median formula fill up missing frequencies. 2. Calculate the AM of the completed distribution.	**[5]**
33	In the figure,$\angle BED = \angle BDE$ andIn the figure, E is the midpoint of BC. Prove that $\frac{AF}{CF} = \frac{AD}{BE}$  	**[5]**
34	The sum of the ages of a boy and his sister (in years) is 25 and product of their ages is 150. Find their present ages. **OR** The length of the hypotenuse of a right - angled triangle exceeds the length of the base by 2 cm and exceeds twice the length of the altitude by 1 cm. Find the length of each side of the triangle.	**[5]**
35	A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled into it. The diameter of the pencil is 7 mm, the diameter of the graphite is 1 mm and the length of the pencil is 10 cm. Calculate the weight of the whole pencil, if the specific gravity of the wood is 0.7 gm/cm^3 and that of the graphite is 2.1 gm/ cm ^{3} . **OR** Two cubes each of volume 125 cm^3 are joined end to end. Find the volume and the surface area of the resulting cuboid.	**[5]**
	Section E	
36	**Read the following text carefully and answer the questions that follow:** Aahana being a plant lover decides to convert her balcony into beautiful garden full of plants. She bought few plants with pots for her balcony.	**[4]**

	She placed the pots in such a way that number of pots in the first row is 2, second row is 5, third row is 8 and so on.  1. Find the number of pots placed in the 10^{th} row. (1) 2. Find the difference in the number of pots placed in 5^{th} row and 2 nd row. (1) 3. If Aahana wants to place 100 pots in total, then find the total number of rows formed in the arrangement. (2) **OR** If Aahana has sufficient space for 12 rows, then how many total number of pots are placed by her with the same arrangement? (2)	
37	**Read the following text carefully and answer the questions that follow:** Use of mobile screen for long hours makes your eye sight weak and give you headaches. Children who are addicted to play "PUBG" can get easily stressed out. To raise social awareness about ill effects of playing PUBG, a school decided to start 'BAN PUBG' campaign, in which students are asked to prepare campaign board in the shape of a rectangle. One such campaign board made by class X student of the school is shown in the figure.  1. Find the coordinates of the point of intersection of diagonals AC and BD. (1) 2. Find the length of the diagonal AC. (1) 3. Find the area of the campaign Board ABCD. (2) **OR**	**[4]**

	Find the ratio of the length of side AB to the length of the diagonal AC. (2)	
38	**Read the following text carefully and answer the questions that follow:** An observer on the top of a 40m tall light house (including height of the observer) observes a ship at an angle of depression 30 ^{o} coming towards the base of the light house along straight line joining the ship and the base of the light house. The angle of depression of ship changes to 45 ^{o} after 6 seconds.  1. Find the distance of ship from the base of the light house after 6seconds from the initial position when angle of depression is 45^o . (1) 2. Find the distance between two positions of ship after 6 seconds? (1) 3. Find the speed of the ship? (2) **OR** Find the distance of ship from the base of the light house when angle of depression is 30 ^{o} . (2)	**[4]**

….All The Best….