

केंद्रीय विद्यालय संगठन, अहमदाबाद संभाग

Kendriya Vidyalaya Sangathan, Ahmedabad Region

कक्षा दसवीं प्री-बोर्ड II परीक्षा 2025-26

Pre Board II Examination 2025-26 for Class X

MATHEMATICS STANDARD (041)

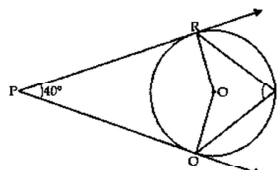
SET A

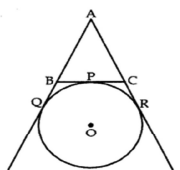
M.M.: 80

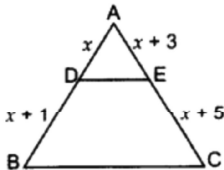
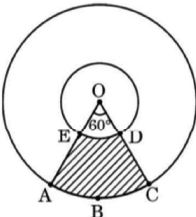
TIME: 3 Hours

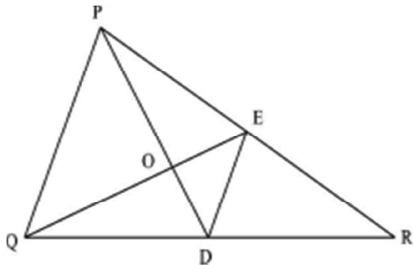
GENERAL INSTRUCTIONS:

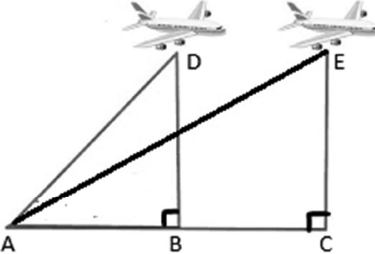
Section A: Multiple Choice Questions (MCQs) and Assertion-Reason Based Questions (1 mark each) Section B: Very Short Answer (VSA) Questions (2 marks each), Section C: Short Answer (SA) Questions (3 marks each) Section D: Long Answer (LA) Questions (5 marks each) Section E: Case Study Based Questions (4 marks each, with sub-parts of 1, 1, and 2 marks)

SECTION-A		
1	The product of HCF and LCM of smallest prime and smallest composite number is (a) 2 (b) 4 (c) 6 (d) 8	1
2	The distance of point $(-3,4)$ from origin is (a) 3 (b) 4 (c) 5 (d) 6	1
3	Lines $2x + 3y = 7$ and $4kx + 6y - 9 = 0$ intersect each other if k is (a) equal to 1 (b) not equal to 1 (c) equal to -1 (d) not equal to -1	1
4	In fig., PQ and PR are tangents drawn from P. If $\angle QPR = 40^\circ$, then find $\angle QSR$. 	1
5	$7k \sec^2 A - 21 \tan^2 A = 21$ then k is (a) 3 (b) 7 (c) 21 (d) 1	1
6	The equation $4x^2 + \sqrt{3}kx + 3 = 0$ has two equal roots, then the value of k is (a) $\pm\sqrt{6}$ (b) ± 4 (c) $\pm 2\sqrt{6}$ (d) $\pm 3\sqrt{6}$	1
7	The largest triangle inscribed in a semi-circle of radius r , then the area of that triangle is; (a) r^2 (b) $2r^2$ (c) $1/2r^2$ (d) $\sqrt{2}r^2$	1
8	One ticket is drawn at random from a bag containing tickets numbered 1 to 50. The probability that the selected ticket has a number which is a two-digit square number: (a) $1/10$ (b) $2/25$ (c) $7/50$ (d) $4/25$	1
9	If A and $(2A - 45^\circ)$ are acute angles such that $\sin A = \cos (2A - 45^\circ)$, then $\tan A$ is equal to (a) 2 (b) $\sqrt{3}$ (c) 1 (d) 0	1
10	LCM of the given number ' x ' and ' y ' where y is a multiple of ' x ' is given by (a) x (b) y (c) xy (d) $x+y$	1
11	The ratio of surface area of sphere of radius r and curved surface area of cylinder having base with radius r and height is equal to the diameter is	1

	(a) 3:1 (b) 2 : 1 (c) 1 : 1 (d) 1 : 2	
12	If the zeroes of the quadratic polynomial $x^2 + (a + 1) x + b$ are 2 and -3, then, (a) $a = -7, b = -1$ (b) $a = 5, b = -1$ (c) $a = 2, b = -6$ (d) $a = 0, b = -6$	1
13	The area of the circle that can be inscribed in a square of side 6 cm is (a) $9\pi \text{ cm}^2$ (b) $19\pi \text{ cm}^2$ (c) $36\pi \text{ cm}^2$ (d) $12\pi \text{ cm}^2$	1
14	A girl calculates that the probability of her winning the first prize in a lottery is 0.12. If 5000 tickets are sold, how many tickets has she bought? (a) 500 (b) 120 (c) 600 (d) 500	1
15	If triangles ABC and DEF are similar and $AB=4 \text{ cm}$, $DE=6 \text{ cm}$, $EF=9 \text{ cm}$ and $FD=12 \text{ cm}$, the perimeter of triangle ABC is: (a) 22 cm (b) 20 cm (c) 21 cm (d) 18 cm	1
16	If $(a/3, 4)$ is the mid-point of the segment joining the points $P(-6, 5)$ and $R(-2, 3)$, then the value of 'a' is (a) 12 (b) -8 (c) 9 (d) -12	1
17	If the mean of frequency distribution is 7.5 and $\sum f_i x_i = 120 + 3k$, $\sum f_i = 30$, then k is equal to: (a) 40 (b) 35 (c) 50 (d) 45	1
18	In the fig. AQ and AR two tangent to the circle if $AQ = 9 \text{ cm}$, The perimeter of $\triangle ABC$ is (a) 9 cm (b) 27 cm (c) 18 cm (d) 12 cm	1
		
19	Assertion(A): $\sqrt{x}$ is an irrational number, where x is a prime number. Reason (R): Square root of any prime number is an irrational number (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 but 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.	1
20	Assertion(A): If $x=2\sin^2\theta$ and $y=2\cos^2\theta+3$ then the value of $x+y=5$. Reason (R): For any value of θ , $\sin^2\theta+\cos^2\theta=1$ (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 but 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.	1
SECTION-B		
21	(A) Which term of AP 117,113,109..... is first negative term. OR (B) The A.P is given as 8, 14, 20,.....362. Find 12th terms from the last term.	2
22	If $\tan \theta + \cot \theta = 5$, find the value of $\tan^2 \theta + \cot^2 \theta$.	2

23	In $\triangle ABC$, $DE \parallel BC$, find the value of x		2
24	The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes. OR A sector is cut from a circle of radius 21 cm. The central angle of the sector is 150° . Find the length of the arc of this sector.		2
25	In the given figure, two concentric circles with centre O are shown. Radii of the circles are 2 cm and 5 cm respectively. Find the area of the shaded region.		2
SECTION-C			
26	Prove that the parallelogram circumscribing a circle is a rhombus. OR Prove that tangent drawn from external point to a circle are equal.		3
27	Prove that $3+2\sqrt{5}$ is irrational; it is given that $\sqrt{5}$ is irrational.		3
28	If α and β are zeroes of a quadratic polynomial $x^2 + x - 42$, then find another polynomial whose zeroes are $\frac{\beta}{\alpha}$ and $\frac{\alpha}{\beta}$.		3
29	Prove that $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$ or Prove that $(\operatorname{cosec} A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$		3
30	The game is played on a pool table with 15 balls numbered 1 through 15 and a cue ball that is solid white. Of the 15 numbered balls, 8 are a solid (non-white) color and numbered 1 through 8, and seven are striped balls numbered 9 through 15. (i) What is the probability of drawing the cue ball? (ii) What is the probability of drawing a striped ball? (iii) What is the probability of drawing an odd number?		3
31	Find the values of x and y from the following pair of linear equations: $62x + 43y = 167$ $43x + 62y = 148$ OR Seven times a two-digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, determine the number.		3

SECTION-D																																		
32	In the given figure, two medians PD and QE of $\triangle PQR$ meet each other at O. Prove that: (i) $\triangle POQ \sim \triangle DOE$ (ii) $PO = 2OD$ (iii) $PO = \frac{2}{3} PD$ 	5																																
33	A wooden toy was made by scooping out a hemisphere of the same radius from each end of a solid cylinder. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the volume of wood in the toy. OR A spherical glass vessel has a cylindrical neck which is 3.5 cm long and 4 cm in diameter. The diameter of the spherical part is 10.5 cm. Find the capacity of the entire glass vessel.	5																																
34	A train travels a distance of 300 km. If the speed had been 10 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.	5																																
35	The following distribution represents the weekly expenses of 100 families in a locality. The median of the data is Rs 432. Find the missing frequencies. <table border="1" data-bbox="261 1003 1382 1152"><tr><th>C. I.</th><th>100-200</th><th>200 - 300</th><th>300 - 400</th><th>400 - 500</th><th>500 - 600</th><th>600 - 700</th><th>700 - 800</th><th>800 - 900</th></tr><tr><th>FREQUENCY</th><td>8</td><td>12</td><td>f_1</td><td>25</td><td>f_2</td><td>11</td><td>7</td><td>4</td></tr></table> OR <table border="1" data-bbox="261 1236 1326 1316"><tr><th>80 - 90</th><th>90 - 100</th><th>100 - 110</th><th>110 - 120</th><th>120 - 130</th><th>130 - 140</th><th>140 - 150</th></tr><tr><td>18</td><td>27</td><td>48</td><td>39</td><td>12</td><td>6</td><td>16</td></tr></table> Find the mean and mode of the data.	C. I.	100-200	200 - 300	300 - 400	400 - 500	500 - 600	600 - 700	700 - 800	800 - 900	FREQUENCY	8	12	f_1	25	f_2	11	7	4	80 - 90	90 - 100	100 - 110	110 - 120	120 - 130	130 - 140	140 - 150	18	27	48	39	12	6	16	5
C. I.	100-200	200 - 300	300 - 400	400 - 500	500 - 600	600 - 700	700 - 800	800 - 900																										
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80 - 90	90 - 100	100 - 110	110 - 120	120 - 130	130 - 140	140 - 150																												
18	27	48	39	12	6	16																												
SECTION-E																																		
36	In investigating different job opportunities, you find that firm A will start you at ₹25,000 per year and guarantee you a raise of ₹1,200 each year whereas firm B will start you at ₹ 28,000 per year but will guarantee you a raise of only ₹ 800 each year. (i) Over a period of 15 years, how much would you receive from firm A? (ii) Over a period of 15 years, how much would you receive from firm B? (iii) What would be your annual salary at firm A for the tenth year? OR (III)B What would be your annual salary at firm B for the tenth year?	1 1 2																																
37	Ayush walks from his house to the office. On his route to office, first he goes to the bank then to his brother's school and then reaches his office. Assume all the																																	

	distances covered are in the straight line and coordinates are in km.(use $\sqrt{5} = 2.23$ if needed.) The coordinates are as follows: - House (H): (1,1) - Bank (B): (4,5) - Brother's School (S): (12,11) - Office (O): (12,23) i) What is the distance from bank to school? ii) What is the distance between the bank and school. iii) Calculate the total distance covered by Ayush during his commute. OR iii) B. While returning Ayush changes his route He goes directly to home so what is the extra distance covered by him in morning?	1 1 2
38	A plane is flying at an altitude of 5000 meters. The angle of elevation from a point on the ground is 30°. After 10 seconds, the angle of elevation changes to 60°.  (i) What is the initial distance from the point to the point directly below the plane? (ii) What is the distance from the point to the point directly below the plane after 10 seconds? (iii) A What is the speed of the plane? OR (iii) B If the plane continues flying at the same speed, what will be its altitude(approximate) after another 10 seconds?	1 1 2

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