KENDRIYA VIDYALAYA SANGATHAN LUCKNOW REGION

PRE-BOARD EXAMINATION

Class - X Session 2025-26

Subject - Mathematics Basic (Code No.241)

Time Allowed: 3 Hours **Maximum Marks: 80**

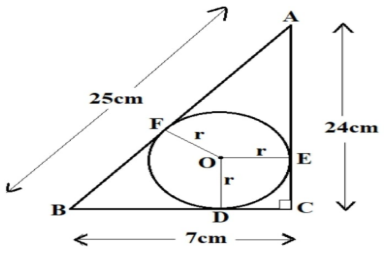
General Instructions:

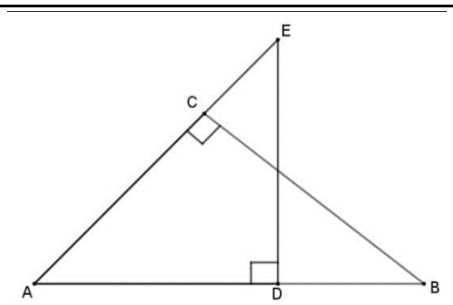
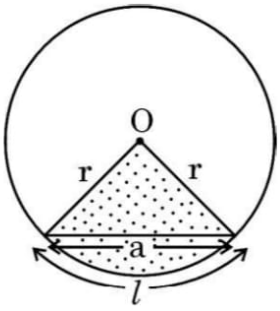
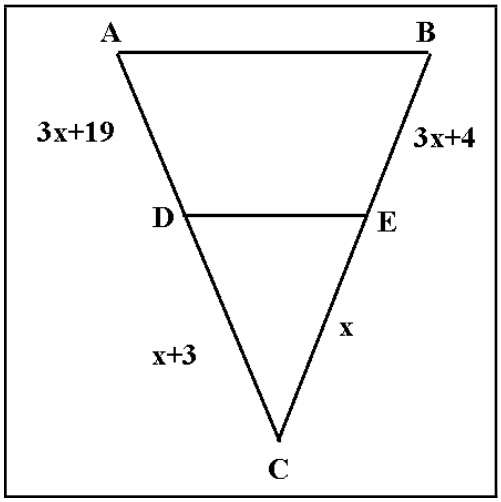
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.
6. Section E has 3 Case Based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. Draw neat figures wherever required. Take π =22/7 wherever required if not stated

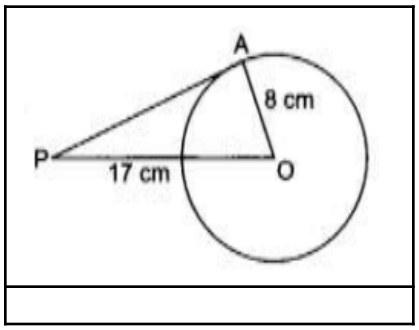
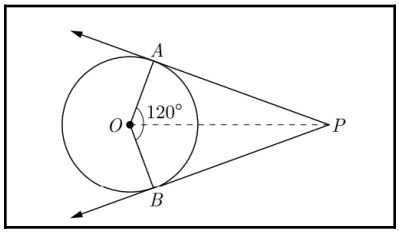
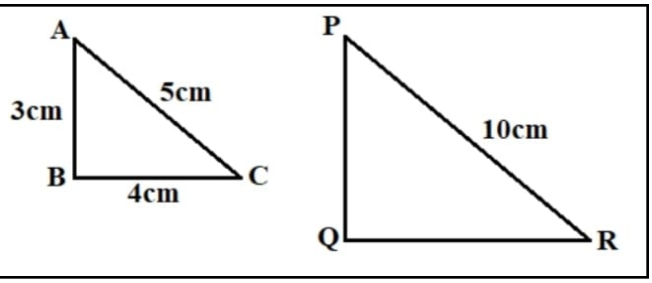
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Section A

Section A consists of 20 questions of 1 mark each.

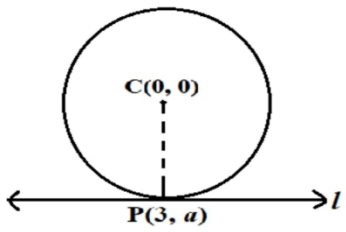
Q1.	If HCF (26,169)=13,then LCM (26,169) is (a) 26 (b) 52 (c) 338 (d) 13	1
2	The value of x for which 2x, (x + 10) and (3x + 2) are the three consecutive terms of an AP is a) 6 b) – 6 c) −2 d) 2	1
3	The arithmetic mean of two numbers a and b is 8 and ab=9 then the quadratic equation whose roots are a and b is (a)$x^2 + 16x + 9 = 0$ $(b)x^2 - 16x + 9 = 0$ $(c)x^2 + 16x - 9 = 0$ $(d)x^2 + 9x - 16 = 0$	1
4	If sum of the zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3 , then find the value of k. a) 3 b) 9 c) 6 d)-6	1
5	If the lines given by 3x+2ky=2 and 2x+5y+1=0 are parallel, then the value of k is a)$\frac{-5}{4}$ $(b)\frac{2}{5}$ $(c)\frac{15}{4}$ $(d)\ \frac{3}{2}$	1
6	In the figure given below, radius r of the circle which touches the sides of the triangle is a) 3 cm b) 6 cm c) 7 cm d) 4 cm 	1

7	In the given figure, ΔBAC is similar to (a) ΔAED (b) ΔEAD (c) ΔACB (d) ΔBCA 	1
8	The perimeter of the shaded region in the given figure is : (a) l (b) l + a (c) l + 2r (d) l + 2r + a 	1
9	 The value of x for which DE|| AB, in the given figure is a)x=2 (b)x=-2 (c)x=3 (d)x=4	1
10	If cos $cos\ A\ = \frac{4}{5}$, then the value of tan A a)3/5 (b)3/4 (c)4/3 (d)5/3	1
11	Value of: $60^0 - 2\tan tan\ 45^0 - 30^0$ a)-2 (b)3/2 (c) 2 (d)-3/4	1
12	If 1 + 2 + 3 + 4 +⋯+ 50 = 25k, then k = a) 50 b) 51 c) 49 d) 26	1

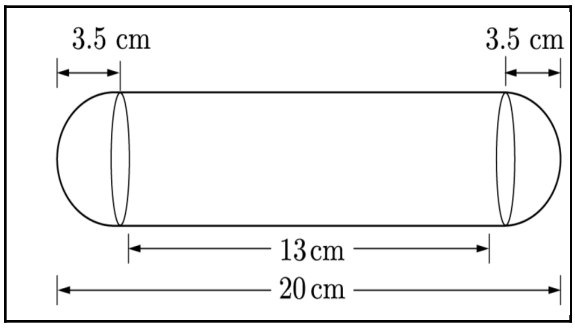
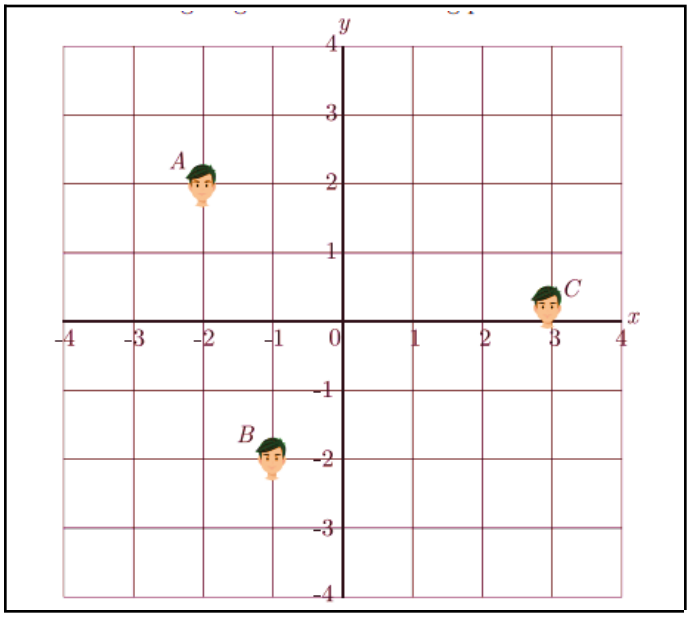
13	 If a point P is 17 cm from the centre of a circle of radius 8 cm, then find the length of the tangent drawn to the circle from point P. a)25cm (b)17cm (c)8cm (d)15cm.	1
14	 In the figure PA and PB are tangents to a circle with centre O. If $\angle AOB = 120°$, then $\angle OPA$=…. a)30° (b)45° (c) 60° *(d)* 90°	1
15	If ΔABC~ΔPQR, then perimeter of the triangle PQR (in cm) is a) 12 b) 24 c) 18 d) 20 	1
16	For the following distribution , the lower limit of modal class is **a)50 (b)40 (c)30 (d)20**	1
17	**For the following distribution , find the median class:**	1

Class	**0-10**	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**
Frequency	**10**	**15**	**12**	**22**	**19**	**20**

Class	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**
Frequency	**6**	**9**	**21**	**8**	**10**	**12**

	a)20-25 (b)10-15 (c)15-20 (d)25-30	
18	A dice is thrown. Find the probability of getting an even number. a)$\frac{2}{3}$ $(b)\frac{1}{3}$ $(c)\frac{5}{6}$ $(d)\frac{1}{2}$	1
19	ASSERTION (A): Two coins are tossed simultaneously. Possible outcomes are two heads, one head and one tail, two tails. Hence, the probability of getting two heads is $\frac{1}{3}$ REASON (R): Probabilities of 'equally likely' outcomes of an experiment are always equal	
	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 two triangles are equiangular, then they are similar. Reason (R) : If two triangles are similar, then they are congruent.	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.	
	SECTION-B	
21.	Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$ and verify the relationship between the zeroes and the coefficients.	2
22	(A) Show that the number 2 × 5 × 7 × 11 + 11 × 13 is a composite number. OR (B) Find the smallest number which is divisible by both 306 and 657.	2
23 (A)	If $\sin\theta + \sin^2\theta = 1$ then prove that $\cos^2\theta + \cos^4\theta = 1$. Or, (B)If $5\tan tan\,\theta = 3$, *then what is the value of* $\frac{5\sin sin\,\theta - 3\cos cos\,\theta}{4\sin sin\,\theta + 3\cos cos\,\theta}$	2
24	Find the radius of the circle with centre at origin, if line l given by $x + y = 5$ is tangent to the circle at point P.  	2

25	Find the value(s) of k for which the equation $2x^2 + kx + 3 = 0$ has real and equal roots	2
	SECTION:C	
26.	Prove that $\sqrt{5}$ is irrational.	3
27.	(A)The following table shows the marks obtained by 110 students of class X in a school during a particular academic session. Find the mode of the distribution. <table><tr><td>*Marks Obtained :*</td><td>0 – 20</td><td>20 – 40</td><td>40 – 60</td><td>60 – 80</td><td>80 – 100</td></tr><tr><td>*Number of Students :*</td><td>21</td><td>25</td><td>30</td><td>24</td><td>10</td></tr></table> OR (B)If the mean of the following distribution is 54, find the value of p. <table><tr><td>**Class Interval**</td><td>0 – 20</td><td>20 – 40</td><td>40 – 60</td><td>60 – 80</td><td>80 – 100</td></tr><tr><td>**Frequency**</td><td>7</td><td>*p*</td><td>10</td><td>9</td><td>13</td></tr></table>	3
28.	The ratio of two numbers is 2:3. If two is subtracted from the first number and 8 from the second, the ratio becomes the reciprocal of the original ratio. Find the numbers. Or, For what value of k, which of the following pair of linear equations have infinitely many solutions: $2x+3y=7$ and $(k+1)x + (2k-1)y = 4k+1$	3
29.	**Evaluate:** $\frac{560^0 + 430^0 - 45^0}{30^0 + 60^0}$	3
30	Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.	3
31.	A sum of ₹ 700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If, each prize is ₹ 20 less than its preceding term, find the value of each of the prizes.	3
	SECTION:D	
32.	The diagonal of a rectangular field is 60 meters more than the shorter side. If the longer side is 30 meters more than the shorter side, find the sides of the field. OR Sum of the areas of two squares is 468 m^2 . If the difference of their perimeters is 24 m, find the sides of the two squares	5
33.	Prove that If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Also State whether EF || QR If E and F are points on the sides PQ and PR respectively of a Δ PQR. and PE = 3.9 cm, EQ = 3 cm, PF = 3.6 cm and FR = 2.4 cm,	5

34.	 A solid is in the form of a cylinder with hemispherical end. The total height of the solid is 20 cm and the diameter of the cylinder is 7 cm. Find the total volume of the solid. (Use $\pi = \frac{22}{7}$)	5
35	A pole 6m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point P on the ground is 60° and the angle of depression of the point P from the top of the tower is 45°. Find the height of the tower and the distance of point P from the foot of the tower. (Use √3 = 1.73) OR Two ships are sailing in the sea on either side of a lighthouse. The angles of depression to the two ships as observed from the top of the lighthouse are 60° and 45° respectively. If the distance between the ships is 100(1+√3)/√3 m, then find the height of the lighthouse.	5
	SECTION:E	
36	 Ajay, Bhigu and Colin are fast friend since childhood. They always want to sit in a row in the classroom . But teacher doesn't allow them and rotate the seats row-wise everyday. Bhigu is very good in maths and he does distance calculation everyday. He consider the centre of class as origin and marks their position on a paper in a co-ordinate system. One day Bhigu make the following diagram of their seating position. (i) What are the coordinates of point A? (ii) What is the distance of point A from origin ?	1 1 2

	(iii) What is the distance between B and C ? Or, A point D lies on the line segment between points A and B such that AD: DB = 4 :3 . What are the the coordinates of point D.	
37	Priya wants to bake a cake and divide it equally among 12 people as shown in the image. The diameter of the cake is 30cm Use the information to answer the questions below(i)How many diameters need to be considered to divide the cake into 12 equal pieces? (ii)What is the total area of the cake? (iii)What is the area of each piece? OR What is the arc length of each piece? 	1 1 2
38	A group of students conducted a survey to find out about the preferred mode of transportation to school among their classmates. They surveyed 200 students from their school. The results of the survey are as follows: 120 students preferred to walk to school. 25% of the students preferred to use bicycles. 10% of the students preferred to take the bus. Remaining students preferred to be dropped off by car. Based on the above information, answer the following questions: (i) What is the probability that a randomly selected student does not prefer to walk to school? (ii) Find the probability of a randomly selected student who prefers to walk or use a bicycle. (iii)(A) One day 50% of walking students decided to come by bicycle. What is the probability that a randomly selected student comes to school using a bicycle on that day? OR (B)What is the probability that a randomly selected student prefers to be dropped off by car?	1 1 2