**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**

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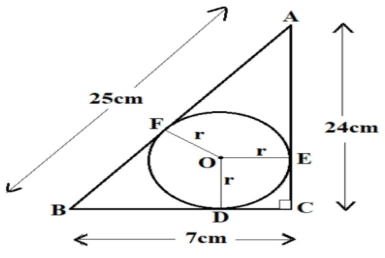
**General Instructions:**

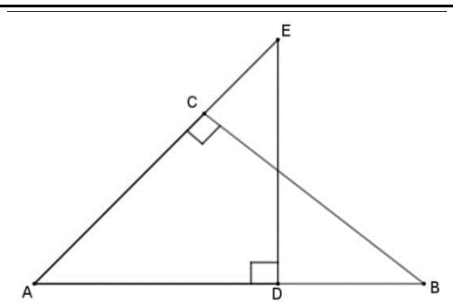
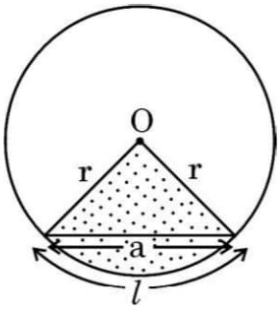
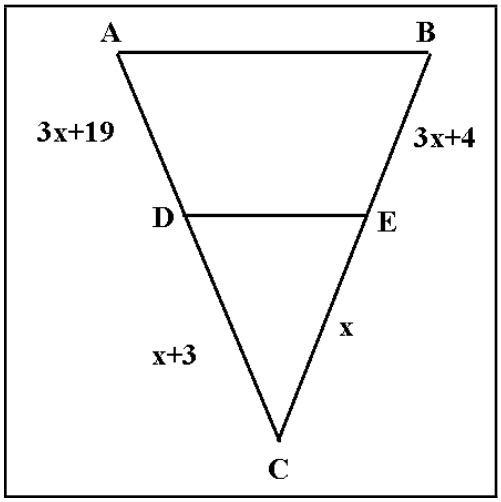
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
5. Section 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

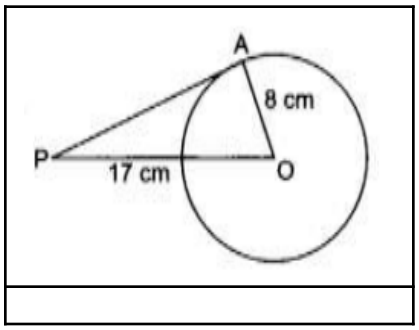
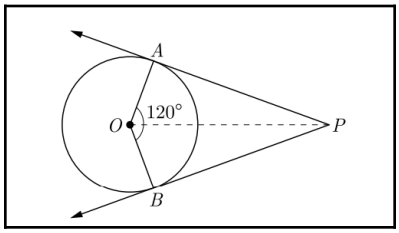
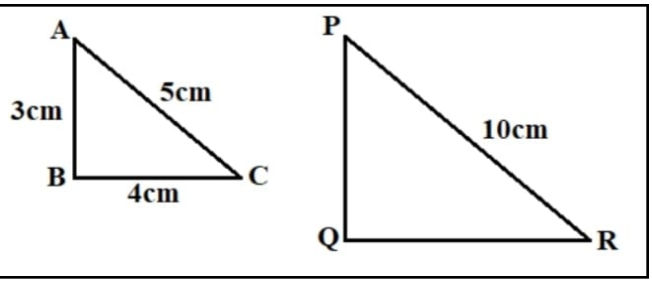
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## Section A

**Section A consists of 20 questions of 1 mark each**.

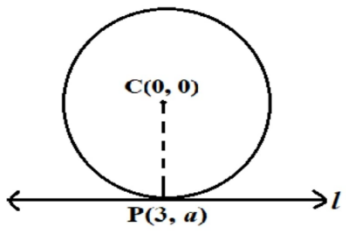
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| Q1. | If HCF (26,169)=13,then LCM (26,169) is<br>(a) 26 (b) 52 (c) 338 (d) 13 | 1 |
| 2 | The value of x for which 2x, (x + 10) and (3x + 2) are the three consecutive terms of an AP is<br>a) 6 b) – 6 c) −2 d) 2 | 1 |
| 3 | The arithmetic mean of two numbers a and b is 8 and ab=9 then the quadratic equation whose roots are a and b is<br>(a)$x^2 + 16x + 9 = 0$ $(b)x^2 - 16x + 9 = 0$<br>$(c)x^2 + 16x - 9 = 0$ $(d)x^2 + 9x - 16 = 0$ | 1 |
| 4 | If sum of the zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3 , then find the value of k.<br>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<br>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<br>a) 3 cm<br>b) 6 cm<br>c) 7 cm<br>d) 4 cm<br> | 1 |

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| 7 | In the given figure, $\Delta BAC$ is similar to<br>(a) $\Delta AED$<br>(b) $\Delta EAD$<br>(c) $\Delta ACB$<br>(d) $\Delta BCA$<br> | 1 |
| 8 | The perimeter of the shaded region in the given figure is :<br>(a) l<br>(b) l + a<br>(c) l + 2r<br>(d) l + 2r + a<br> | 1 |
| 9 | <br>The value of x for which DE\|\| AB, in the given figure is<br>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<br>a)3/5 (b)3/4 (c)4/3 (d)5/3 | 1 |
| 11 | Value of: $60^0 - 2\tan tan\ 45^0 - 30^0$<br>a)-2 (b)3/2 (c) 2 (d)-3/4 | 1 |
| 12 | If 1 + 2 + 3 + 4 +⋯+ 50 = 25k, then k =<br>a) 50 b) 51 c) 49 d) 26 | 1 |

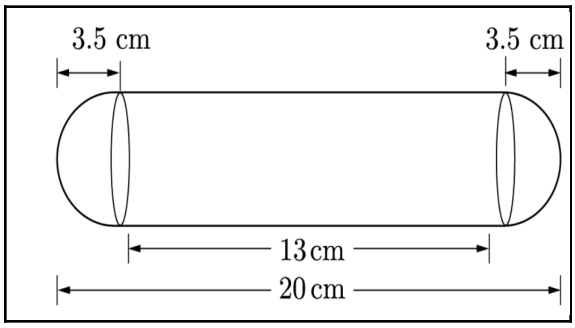
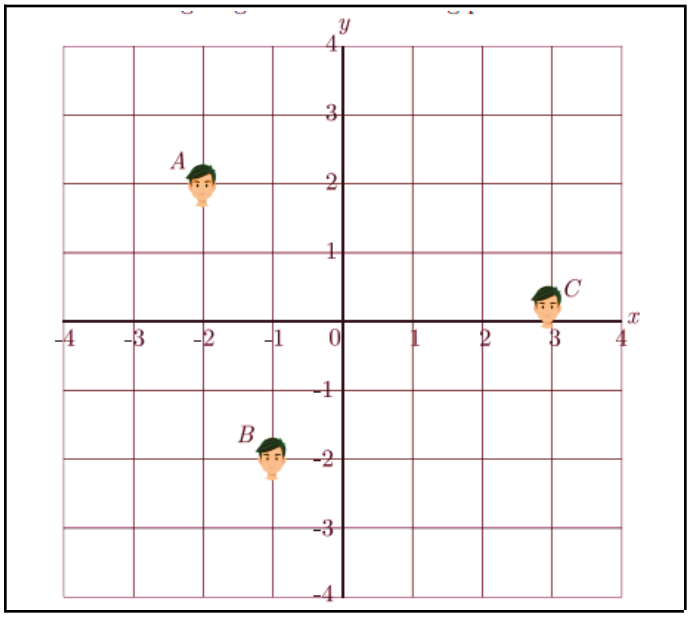
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| 13 | <br>If a point P is 17 cm from the centre of a circle of radius 8 cm, then find the length of the tangent drawn to the circle from point P.<br>a)25cm (b)17cm (c)8cm (d)15cm. | 1 |
| 14 | <br>In the figure PA and PB are tangents to a circle with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

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| | **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.<br>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 $\frac{1}{3}$<br>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).<br>b. Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).<br>c. Assertion (A) is true but reason (R) is false.<br>d. Assertion (A) is false but reason (R) is true. | 1 |
| 20 | Assertion (A) : If two triangles are equiangular, then they are similar.<br>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).<br>b. Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).<br>c. Assertion (A) is true but reason (R) is false.<br>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.<br>OR<br>(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 $\cos^2\theta + \cos^4\theta = 1$.<br>Or,<br>(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.<br><br> | 2 |

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| 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.<br><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><br>OR<br>(B)If the mean of the following distribution is 54, find the value of p.<br><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.<br>Or,<br>For what value of k, which of the following pair of linear equations have infinitely many solutions:<br>$2x+3y=7$ and $(k+1)x + (2k-1)y = 4k+1$ | 3 |
| 29. | **Evaluate:**<br>$\frac{560^0 + 430^0 - 45^0}{30^0 + 60^0}$ | 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.<br>OR<br>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.<br>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 |

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| 34. | <br>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)<br>OR<br>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 | <br>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.<br><br>(i) What are the coordinates of point A?<br><br>(ii) What is the distance of point A from origin ? | 1<br>1<br>2 |

| | | |
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| | (iii) What is the distance between B and C ?<br>Or,<br>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<br>Use the information to answer the questions below(i)How many diameters need to be considered to divide the cake into 12 equal pieces?<br><br>(ii)What is the total area of the cake?<br><br>(iii)What is the area of each piece?<br>OR<br>What is the arc length of each piece?<br><br> | 1<br><br>1<br><br>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:<br>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.<br>Based on the above information, answer the following questions:<br><br>(i) What is the probability that a randomly selected student does not prefer to walk to school?<br><br>(ii) Find the probability of a randomly selected student who prefers to walk or use a bicycle.<br><br>(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?<br>OR<br>(B)What is the probability that a randomly selected student prefers to be dropped off by car? | 1<br><br>1<br><br>2 |