



COMMON PRE-BOARD EXAMINATION
MATHEMATICS (BASIC)–Code No. 241
CLASS-X-(2025-26)



SET: 1

Time allowed: 3 Hrs.

Maximum Marks: 80

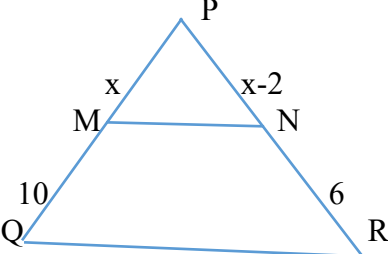
General Instructions:

Read the following instructions very carefully and follow them:

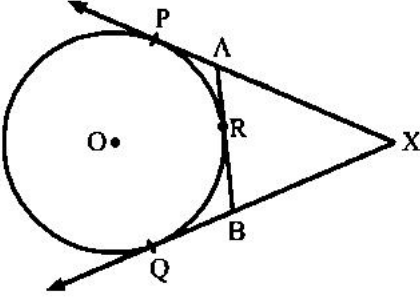
1. This Question Paper has 5 Sections A - E.
 2. Section **A** has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
 3. Section **B** has 5 questions carrying 02 marks each.
 4. Section **C** has 6 questions carrying 03 marks each.
 5. Section **D** has 4 questions carrying 05 marks each.
 6. Section **E** has 3 Case Based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
 7. All Questions are compulsory. However, an internal choice in 2 questions of 5 marks, 2 questions of 3 marks and 2 questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
 8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$, wherever required if not stated.
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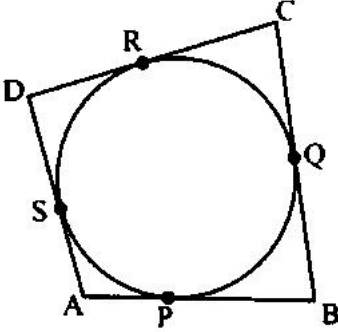
Section A

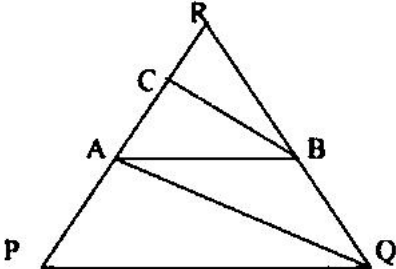
1.	How many zeroes does the number $24 \times 25 \times 17 \times 15 \times 2^3 \times 5^2$ end with ? a) 6 b) 5 c) 4 d) 3	1
2.	Which is the quadratic polynomial whose zeroes are -5 and -1 ? a) $x^2 - 6x + 5$ b) $x^2 - 6x - 5$ c) $x^2 + 6x + 5$ d) $x^2 + 6x - 5$	1
3.	Which among the following line is parallel to the line $2x - 3y = 6$? a) $4x - 6y = 12$ b) $4x + 6y = 12$ c) $4x - 6y = 3$ d) $4x + 6y = 3$	1

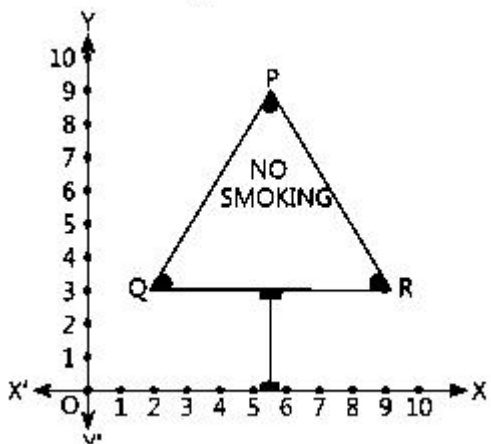
4.	<p>What is k if the quadratic equation $5x^2 - 2x + k = 0$ has equal roots ?</p> <p>a) 5 b) $1/5$ c) -5 d) $-1/5$</p>	1
5.	<p>In an AP, $a_{17} - a_{12} = 45$. Find d.</p> <p>a) -9 b) $45/27$ c) $-45/27$ d) 9</p>	1
6.	<p>Find k if $5k+1$, $8k-3$ and $9k+7$ are in AP.</p> <p>a) 7 b) 1 c) 2 d) -7</p>	1
7.	<p>The shadow of a pole of height 10 m is 16 m. At the same time, what is the length of shadow of a tower of 25 m high ?</p> <p>a) 30 m b) 35m c) 40 m d) 45 m</p>	1
8.	<p>In the given figure, $MN \parallel QR$. If $PM = x$ cm, $MQ = 10$ cm, $PN = x - 2$ cm and $NR = 6$ cm, then the value of x is</p>  <p>a) 5cm b) 4 cm c) 6 cm d) 3 cm</p>	1
9.	<p>The ratio in which the line segment joining $A(1,4)$ and $B(2,-7)$ is divided by the x-axis is</p> <p>a) 7:4 b) 3: 2 c) 2: 3</p>	1

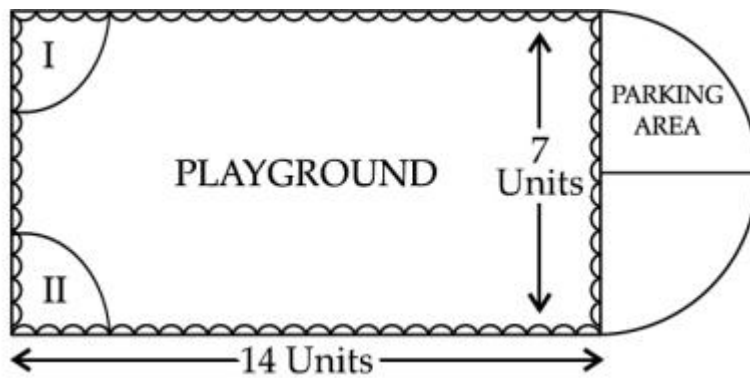
	d) 4: 7	
10.	The distance between (a, 0) and (0, a) is a) 0 b) 2a c) $\sqrt{2}$ a d) 4a	1
11.	The length of the tangent from a point A at a distance 5 cm from the centre of the circle is 4 cm. The radius of the circle is a) 9 cm b) 1 cm c) 6 cm d) 3 cm	1
12.	TP and TQ are tangents to a circle with centre O from an external point T. $\angle POQ = 115^\circ$, then $\angle PTQ$ is a) 75° b) 35° c) 65° d) 55°	1
13.	The length of arc of a circle with central angle 90° is 11 cm. The radius of the circle is a) 3.5 cm b) 7 cm c) 14 cm d) 10.5 cm	1
14.	In a class of 40 students, 25 are girls. One student is chosen at random. The probability that the student is a boy is a) $\frac{3}{8}$ b) $\frac{5}{8}$ c) $\frac{1}{2}$ d) $\frac{3}{4}$	1
15.	Which among the following can not be the probability of any event ? a) 0 b) 1 c) $\frac{3}{5}$ d) $\frac{5}{3}$	1
16.	Which among the following is the relation between mean, median and mode ? a) $3 \text{ Mode} = 2 \text{ Median} + \text{Mean}$ b) $3 \text{ Mean} = 2 \text{ Mode} + \text{Median}$ c) $3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$ d) $3 \text{ Median} = 2 \text{ Mode} + \text{Mean}$	1

17.	<p>Which is the modal class ?</p> <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>17</td> <td>11</td> <td>21</td> <td>23</td> <td>18</td> </tr> </table> <p>a) 10-20 b) 20-30 c) 30-40 d) 40-50</p>	Class	0-10	10-20	20-30	30-40	40-50	Frequency	17	11	21	23	18	1
Class	0-10	10-20	20-30	30-40	40-50									
Frequency	17	11	21	23	18									
18.	<p>$7\sec^2 x - 7\tan^2 x$ equal to</p> <p>a) 1 b) -7 c) 7 d) none of these</p>	1												
	<p>Assertion - Reason</p> <p>For questions 19 and 20, choose the correct option from the following :</p> <p>a) Both A and R are true and R is the correct explanation of A b) Both A and R are true and R is not the explanation of A c) A is true but R is false d) A is false but R is true</p>													
19.	<p>Assertion (A) : If ΔABC and ΔPQR are congruent triangles, then they are similar triangles.</p> <p>Reason (R) : All congruent triangles are similar, but all similar triangles need not be congruent.</p>	1												
20.	<p>Assertion (A) : In the given figure, $XA + AR = XB + BR$, where XP, XQ and AB are tangents.</p>  <p>Reason (R) : A tangent to a circle is perpendicular to the radius through the point of contact.</p>	1												

	Section B	
21.	HCF $(a, 80) = 40$ and LCM $(a, 80) = 120$. Find a .	2
22.	A) One zero of the polynomial $(5k - 2)x^2 - 3x + 3k$ is reciprocal of the other, find the value of k . OR B) If α and β are the zeroes of the polynomial $2x^2 - 3x + 6$, then evaluate $2\alpha + 2\beta + \alpha\beta$.	2
23.	A) If $\sin(A + B) = \frac{\sqrt{3}}{2}$ and $\sin(A - B) = \frac{1}{2}$, find A and B . OR B) If $4 \tan\theta = 3$, evaluate $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta}$.	2
24.	Sum of a number and its reciprocal is $\frac{10}{3}$. Find the number.	2
25.	Prove that tangents from an external points to a circle are equal in length.	2
	Section C	
26.	A) Evaluate using trigonometric table : $\frac{3\sin^2 60^\circ + 5\tan^2 45^\circ - \cos 60^\circ}{2\cos^2 30^\circ + \sin 30^\circ + \tan^2 60^\circ}$. OR B) Prove that $(\sec\theta - \tan\theta)^2 = \frac{1 - \sin\theta}{1 + \sin\theta}$.	3
27.	ABCD is a quadrilateral circumscribing a circle. Prove that $AB + CD = BC + AD$. 	3
28.	Given $\sqrt{2}$ is irrational. Hence prove $9 - 7\sqrt{2}$ is irrational	3
29.	A fraction is such that if the numerator is multiplied by 2 and the denominator is increased by 2, we get $\frac{5}{4}$. If the numerator is increased by 1 and the denominator is doubled, we get $\frac{1}{2}$. Find the fraction.	3

30.	<p>A) The 18th term of an AP is 63 and the 11th term is 42. Find its 25th term.</p> <p style="text-align: center;">OR</p> <p>B) Which term of the AP 8, 14, 20, will be 72 more than the 41st term ?</p>	3														
31.	<p>Find the median of the following data :</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Class</th> <th>0-20</th> <th>20-40</th> <th>40-60</th> <th>60-80</th> <th>80-100</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>7</td> <td>6</td> <td>9</td> <td>10</td> <td>8</td> <td>40</td> </tr> </tbody> </table>	Class	0-20	20-40	40-60	60-80	80-100	Total	Frequency	7	6	9	10	8	40	3
Class	0-20	20-40	40-60	60-80	80-100	Total										
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Section D																
32.	<p>A) A train covers 360 km at a uniform speed, If the speed had been 5 km/h more, it would have taken 1 hour less for the journey. Find the speed of the train.</p> <p style="text-align: center;">OR</p> <p>B) Solve for x: $\frac{1}{x+1} + \frac{3}{5x+1} = \frac{5}{x+4}$, where $x \neq -1, -4, -\frac{1}{5}$.</p>	5														
33.	<p>A) A toy is in the form of a solid cylinder with two hemispherical ends. The radii of cylinder and hemisphere being 7 cm. The total length of the toy is 24 cm. Find the volume and surface area of the toy.</p> <p style="text-align: center;">OR</p> <p>B) A cylindrical vessel of radius 14 cm and height 20 cm is full of water. An iron solid in the shape of a cone surmounted by a hemisphere is dropped in the water so that certain amount of water flows out. The common radii of cone and hemisphere is 7 cm and height of cone is 10 cm. What is the volume of water remaining in the cylindrical vessel ?</p>	5														
34.	<p>Prove that: In a triangle, if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the two sides are divided in the same ratio. Using the above result, prove the following:</p> <div style="text-align: center;">  </div>	5														

	In the figure, AB parallel to PQ and BC parallel to AQ. Prove that $AR^2 = PR \cdot CR$.	
35.	A man standing on the deck of a ship 10 m high, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . Find the height of the hill.	5
	Section E	
36.	<p>Case Study 1: All of the persons know that smoking is injurious to health. So, some college students decided to start a campaign. To raise social awareness about hazards of smoking, they started NO SMOKING campaign. Some students were asked to prepare banners in the shape of triangle which is shown in the figure</p>  <p>Based on the above information, answer the following questions :</p> <p>(i) Find the coordinates of Q and R</p> <p>(ii) Find the mid point of QR</p> <p>(iii) A) Find a point on X- axis which is equidistant from Q and R</p> <p style="text-align: center;">OR</p> <p>B) Find the area of triangle PQR</p>	<p>1</p> <p>1</p> <p>2</p>
37.	<p>Case Study 2: Governing council of a local public development authority decided to build a playground on the valley of a hill which will have adequate space for parking.</p> <p>After survey it was decided to build a rectangular play ground with a semi circular parking area at one end . The length and breadth of play grounds are 14 and 7 units respectively. There are two quadrants of radius 2 units each at both corners of one end to reserve for VIP seats.</p>	



Based on the above information, answer the following questions :

- (i) What is the area of the semi circular parking space ?
- (ii) How much area is reserved for VIP seats ?
- (iii) A) What is the total perimeter of the rectangular play ground and parking area ?

1
1
2

OR

B)What is the total area of the play ground,VIP seating and parking area ?

38. **Case Study 3:**

Anu and Saj decided to have game with numbers. Anu wrote numbers from 5 to 40 on cards such a way that each number on different cards. She asked Saj to choose a number. He chose a card randomly from the cards of numbers.



Based on the following information, answer the following questions :

- (i) What is the probability that the card drawn contains an even number ?
- (ii) What is the probability that the drawn card contains a number which is a perfect square ?
- (iii) A) What is the probability that the drawn card contains a prime number ?

1
1
2

OR

B)What is the probability that the drawn card contains a number which is a multiple of 3 or 4.