

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

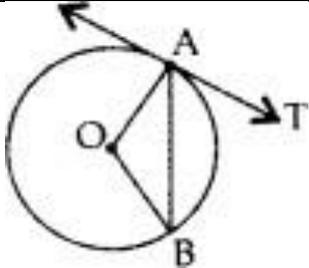
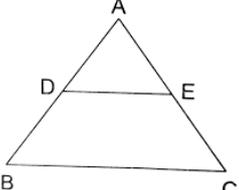
**Maximum marks:80 Time:3 hours**

**General Instructions: -**

**Read the following instructions carefully and follow them: -**

1. This question paper contains 38 questions. All Questions are compulsory.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and question no.19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Question numbers 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. There is no overall choice. 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. Take  $\pi = 22/7$  wherever required if not stated.
10. Use of calculators is not allowed.

<b>SECTION – A</b> <b>(Multiple Choice Questions)</b>		
Each MCQ of 1mark, has four options with only one correct option, choose the correct option		
Q.No.	Question	Marks
<b>Q1.</b>	The prime factorisation of a number contains two 2's, one 3 and two 7's.The number is: a) 488                      b)588                      c)294                      d)882	<b>1</b>
<b>Q2.</b>	If graph of a polynomial intersect x axis at 2 points and y axis at 1point then number of zeroes of polynomial are: a) 3                              b) 1                              c) 2                              d) 4	<b>1</b>
<b>Q3.</b>	The value of k for which quadratic equation $kx^2 - 6x + 1 = 0$ has equal roots is: a) -6                      b) -9                      c) 9                      d)-6	<b>1</b>
<b>Q4.</b>	The graph of a pair of linear equation intersect each other at one point .which of the following is the possible pair of equation a) $2x+3y=6, 4x+6y= 12$ c) $3x-4y= -1, 6x +8y= -2$ b) $-2x+3y= 6, 4x-6y= 12$ d) $3x+4y=-1, -3x-4y=1$	<b>1</b>
<b>Q5.</b>	If zeroes of a quadraticpolynomial $2x^2-3x-k$ are reciprocal of each other than $k=$ a) -3                      b) -2                      c) 3                      d) 2	<b>1</b>
<b>Q6.</b>	If $n+1, 2n-5$ and $5n+3$ are in AP then n is: a) 8                      b) -7                      c) 7                      d) -8	<b>1</b>

<b>Q7.</b>	A point on x axis is represented by (a)(x,0)      (b)(0,x)      (c) ( 0,0)      (d) (x,y)	<b>1</b>												
<b>Q8.</b>	If the distance between the points (p, - 5) and (2,7) is 13 units, then the value of p is a) -3, -7      b) 3, -7      c) 3, 7      d) -3, 7	<b>1</b>												
<b>Q9.</b>	Evaluate $(\sec A + \tan A)(1 - \sin A)$ (a) $\sec A$ (b) $\sin A$ (c) $\operatorname{cosec} A$ (d) $\cos A$	<b>1</b>												
<b>Q10.</b>	Condition for no real roots for a quadratic equation $ax^2+bx+c=0$ is a) $b^2-4ac > 0$ b) $b^2-4ac < 0$ c) $b^2-4ac = 0$ d) $b-4ac < 0$	<b>1</b>												
<b>Q11.</b>	If $\sin A = \cos A$ for a given acute angle A, then A is a) $90^\circ$ b) $30^\circ$ c) $45^\circ$ d) $0^\circ$	<b>1</b>												
<b>Q12.</b>	The area of the circle that can be inscribed in a square of side 6 cm is: (a) $36\pi\text{cm}^2$ (b) $18\pi\text{cm}^2$ (c) $12\pi\text{cm}^2$ (d) $9\pi\text{cm}^2$	<b>1</b>												
<b>Q13.</b>	In the given figure, O is the centre of a circle, AB is a chord and AT is the tangent at A. If $\angle AOB = 100^\circ$ , then $\angle BAT$ is .  a) $40^\circ$ b) $50^\circ$ c) $100^\circ$ d) $60^\circ$		<b>1</b>											
<b>Q14.</b>	The area of sector of a circle is $\frac{5}{18}$ th time area of the circle then the central angle is a) $60^\circ$ b) $90^\circ$ c) $120^\circ$ d) $100^\circ$	<b>1</b>												
<b>Q15.</b>	In a triangle ABC, $DE \parallel BC$ , $AD = 2.5\text{cm}$ , $BD = 5\text{cm}$ , $AC = 12\text{cm}$ then, find EC   (a) 6 cm      (b) 5 cm      (c) 8 cm      (d) 4 cm	<b>1</b>												
<b>Q16.</b>	For the following distribution the sum of lower limits of the median class and modal class is  <table border="1" data-bbox="271 1534 1260 1624"> <thead> <tr> <th>Class</th> <th>60 – 70</th> <th>70 – 80</th> <th>80 – 90</th> <th>90 – 100</th> <th>100 – 110</th> </tr> </thead> <tbody> <tr> <th>Frequency</th> <td>10</td> <td>15</td> <td>12</td> <td>20</td> <td>9</td> </tr> </tbody> </table> a) 190      b) 160      c) 180      d) 170	Class	60 – 70	70 – 80	80 – 90	90 – 100	100 – 110	Frequency	10	15	12	20	9	<b>1</b>
Class	60 – 70	70 – 80	80 – 90	90 – 100	100 – 110									
Frequency	10	15	12	20	9									
<b>Q17.</b>	Three coins are tossed simultaneously. the probability of getting 2 Heads is: a) $\frac{1}{2}$ b) $\frac{3}{4}$ c) $\frac{5}{8}$ d) $\frac{3}{8}$ .	<b>1</b>												
<b>Q18.</b>	During conversion of a solid from one shape to another, the volume of the new shape will (a) increase      (b) decrease      (c) remain unaltered      (d) be doubled	<b>1</b>												

**Each of the following questions contains two statements i.e., ASSERTION and REASON, and has following four choices.**

- 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.

**Only one of which is the correct answer.**

<b>Q19.</b>	<b>ASSERTION (A):</b> If mean and mode is given than median can be find for a given data without actual calculation for a given data. <b>REASON (R):</b> The mean, median and mode are connected by the relation: $3\text{median} = 2\text{mean} + \text{mode}$	<b>1</b>
<b>Q20.</b>	<b>ASSERTION (A):</b> The value of $\sin A$ can never be greater than 1. <b>REASON (R):</b> $\sin A$ is the ratio of perpendicular to the hypotenuse.	<b>1</b>

**SECTION – B**  
**(Very Short Answers)**

This section comprises of VSA of 2 marks each

Q. No.	Question	Mark s
<b>Q21.</b>	Check whether $6^n$ can end with 0 for any natural number n .	<b>2</b>
<b>Q22.</b>	The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour. <p style="text-align: center;">OR</p> The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.	<b>2</b>
<b>Q23.</b>	A quadrilateral ABCD circumscribes a circle. Show that $AB+CD = BC+DA$ . Or	<b>2</b>
<b>Q24.</b>	Find the zeroes of the quadratic polynomial $f(x) = x^2 - x - 2$ and verify the relationship between zeroes and coefficients.	<b>2</b>
<b>Q25.</b>	If $\tan(A-B)=1$ and $\tan(A+B)=\sqrt{3}$ , $0^\circ < A+B \leq 90^\circ$ and $A > B$ , then find the measures of angles A and B.	<b>2</b>

**SECTION – C**  
**(Short Answers)**

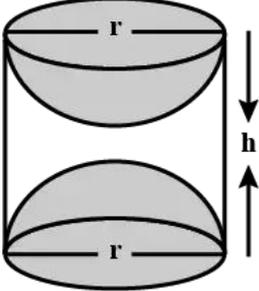
This section comprises of SA of 3 marks each

Q. No.	Question	Mar ks
Q26.	<p>The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is ₹ 205 and for a journey of 15 km, the charge paid is ₹ 255. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 35 km?</p> <p style="text-align: center;"><b>OR</b></p> <p>The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?</p>	3
Q27.	<p>If <math>\cot\theta = 7/8</math>, evaluate:</p> <p>i) <math>\frac{(1+\sin\theta)(1+\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}</math></p> <p>ii) <math>\sec^2\theta - 1</math></p>	3
Q28.	<p>Prove that radius is perpendicular to the tangent at the point of contact. If the length of tangent to a circle of radius 5 cm is 12 cm then find the distance of the external point from the centre.</p> <p style="text-align: center;">Or</p> <p>Prove that tangents drawn from external point to a circle are equal.</p>	3
Q29.	<p>Two dice are thrown simultaneously at random. Find the probability of getting</p> <p>i) a doublet      ii) sum a multiple of 4      iii) sum 12.</p>	3
Q30.	<p>Prove that <math>\sqrt{5}</math> is irrational.</p>	3
Q31.	<p>ABCD is a trapezium with <math>AB \parallel DC</math>. E and F are points on non-parallel sides AD and BC respectively such that EF is parallel to AB. Show that</p> $\frac{AE}{ED} = \frac{BF}{FC}$	3

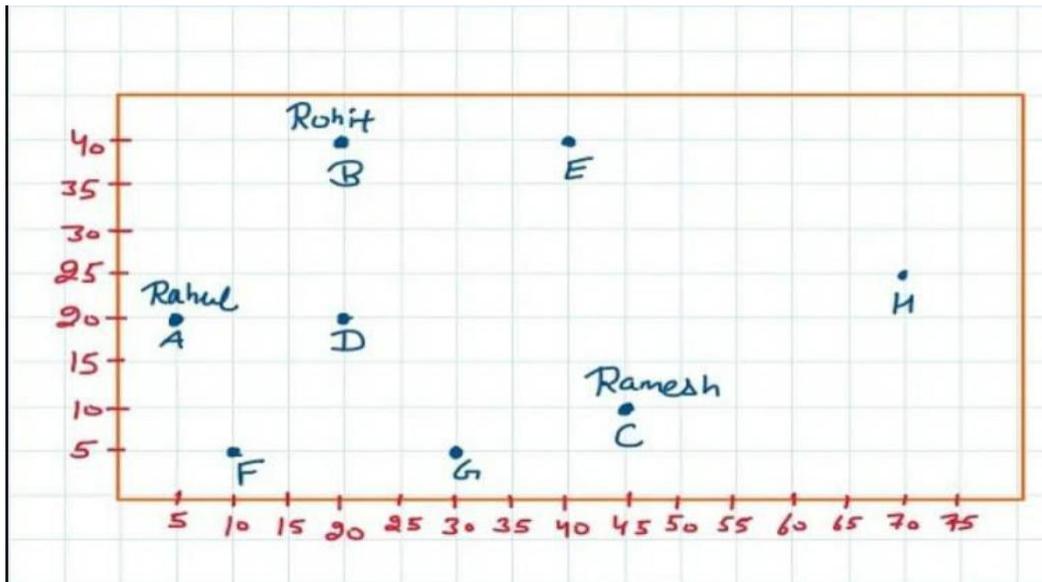
**SECTION – D**  
**(Long Answers)**

This section comprises of LA type questions of 5 marks each

Q. No.	Question	Mar ks
Q32.	<p>Prove that in a triangle a line drawn parallel to any one side of the triangle intersecting the other two sides at distinct points then the two sides are divided in the same ratio.</p>	5

<p><b>Q33.</b></p>	 <p>A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in fig. If the height of the cylinder is 10cm, and its base is of radius 3.5 cm, find the total surface area of the article.</p> <p style="text-align: center;"><b>OR</b></p> <p>From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest <math>\text{cm}^2</math>.</p>	<p><b>5</b></p>																														
<p><b>Q34.</b></p>	<p>The marks of the students in half yearly exam were recorded as follows.</p> <table border="1" data-bbox="248 864 1295 969"> <thead> <tr> <th>Marks</th> <th>0 - 10</th> <th>10 - 20</th> <th>20 - 30</th> <th>30 - 40</th> <th>40 - 50</th> <th>50 - 60</th> </tr> </thead> <tbody> <tr> <td>Number of students</td> <td>12</td> <td>18</td> <td>27</td> <td>20</td> <td>17</td> <td>6</td> </tr> </tbody> </table> <p>Find the median and modal marks from the above data. hence find the mean marks using empirical formula.</p> <p style="text-align: center;"><b>OR</b></p> <p>The mode of the following frequency distribution is 36. Find the missing frequency <math>f</math>.</p> <table border="1" data-bbox="272 1153 1377 1279"> <thead> <tr> <th>Class interval</th> <th>0- 10</th> <th>10-20</th> <th>20-30</th> <th>30-40</th> <th>40-50</th> <th>50-60</th> <th>60-70</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>8</td> <td>10</td> <td><math>f</math></td> <td>16</td> <td>12</td> <td>6</td> <td>7</td> </tr> </tbody> </table>	Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Number of students	12	18	27	20	17	6	Class interval	0- 10	10-20	20-30	30-40	40-50	50-60	60-70	Frequency	8	10	$f$	16	12	6	7	<p><b>5</b></p>
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<p><b>Q35.</b></p>	<p>The difference of the squares of two positive numbers is 180. Find the numbers if square of smaller number is 8 times than the greater number.</p>	<p><b>5</b></p>																														

<p><b>SECTION – E</b> <b>(Case-study Based Questions)</b></p>		
<p>This section comprises of 3 case-study based questions of 4 marks each with three sub-parts.</p>		
Q. No.	Question	Marks
<p><b>Q36.</b></p>	<p>Football is the most popular game in the world. It combines strength, speed, and skills. Football is the most-watched and most played sport on the earth. In Canada and America, it is called Soccer. Football was invented in China nearly 476 BC. It is a 90 minutes long game and those 90 minutes are distributed in two 45 minutes halves.</p> <p>Three friends Rohit, Rahul, and Ramesh decide to play Football in a playground of the School. The position of Rohit, Rahul, and Ramesh is shown in the diagram.</p>	



1  
1  
2

- (a) What is the Co-ordinate of Ramesh's position on the field?  
 (ii) Find the distance between Rahul and Ramesh position.  
 (c) If Rahul takes Football to position E and Rohit comes at position G then find the distance between them.  
 OR  
 Find the midpoint of the line segment joining the Rahul and Ramesh position.

**Q37.**

A group of students visited India Gate on a trip. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial is dedicated to troops of British India who died in wars fought between 1914 and 1919. It is also about 138 feet (42m) in height.



- (a) What is the angle of elevation if they're standing 42m away from India Gate?  
 (b) What distance should be between the monument and students if they wish to view it from 60 degrees?

1  
1

	<p>(c) If altitude of sun is at 30degrees, then what is the length of shadow that it will cast?</p> <p style="text-align: center;"><b>OR</b></p> <p>India Gate's height is 42m. What will be the cost of the wire if it were to be tied from the top of the monument and reach the ground at elevation angle of <math>30^\circ</math> @ ₹50 per metre?</p>	<b>2</b>
<b>Q38.</b>	<p>Sales goals are the objectives a company or a team wants to achieve in a given time. It gives sales teams a roadmap of what they need to do to help their company achieve specific targets.</p> <p>At the time that I was newly hired, 100 sales per month was what I required. Each following month the last plus 20 more, as I work for the goals of top sales award. When 2500 sales are thusly made, I got a holiday package.</p> <p>Based on the above information answer the following questions:</p> <p>(i) Write an AP for the given situation.</p> <p>ii) How many sales were made by this person in the seventh month?</p> <p>iii) What were the total sales after the 12th month?</p> <p style="text-align: center;"><b>OR</b></p> <p>After how many month will the sale be 2500 ?</p>	<b>1</b> <b>1</b>  <b>2</b>