

EMINENT TUTORIALS <hr/> Class-x	MATHEMATICS PAPER	PAPER NO. 1
Add. Opp. Deep Palace, Rania		

Time Allowed : 3 Hours

Maximum Marks : 80

General Instructions :

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

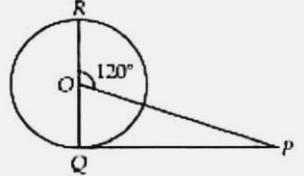
Part – A consists 20 questions

1. It consists three sections- I and II.
2. Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.
3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

Part – B: consists 16 questions.

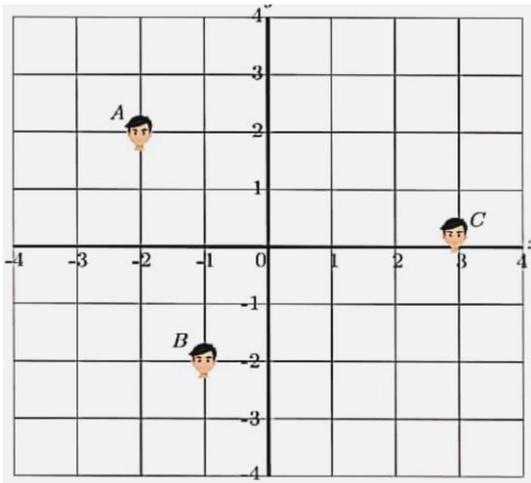
1. Question No 21 to 26 are Very short answer Type questions of 2 mark each,
2. Question No 27 to 33 are Short Answer Type questions of 3 marks each
3. Question No 34 to 36 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 3 questions of 1 marks, 3 questions of 2 marks, 4 questions of 3 marks and 2 question of 5 marks.

Sr. No.	PART-A	<u>Marks</u>
	SECTION-1	
	Section-I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.	
1.	Write down the discriminant of the quadratic equation of $x^2 + 4x + q = 0$.	<u>1</u>
2.	(i) The L.C.M. of x and 18 is 36. (ii) The H.C.F. of x and 18 is 2. What is the number x ?	<u>1</u>
3.	For what value of k , the roots of equation $3x^2 - 10x + k = 0$ are reciprocal of each other? OR If $k + 1 = \sec^2\theta(1 - \sin\theta)(1 + \sin\theta)$, then find the value of k .	<u>1</u>
4.	Find the value of k so that the following system of equations has no solution: $3x - y - 5 = 0, \quad 6x - 2y + k = 0$ OR Solve : $4x^2 + 5x = 0$.	<u>1</u>
5.	The highest power of a variable in a polynomial is called its	<u>1</u>
6.	For the AP 0.6,1.7,2.8,3.9.....,write the first term and the common difference.	<u>1</u>
7.	Find the distance of a point (x, y) from the origin.	<u>1</u>

8.	PQ is a tangent drawn from an external point P to a circle with centre O, QOR is the diameter of the circle. If $\angle POQ = 120^\circ$, what is the measure of $\angle OPQ$?		<u>1</u>
9.	Someone is asked to make a number from 1 to 100. The probability that it is a prime is OR Two dice are thrown at random .What is the probability of getting the sum of numbers obtained as 9?		<u>1</u>
10.	If the heights of two cylinders are equal and their radii are in the ratio of 7 : 5, then the ratio of their volumes is		<u>1</u>
11.	If the n^{th} term of an A.P. -1,4,9,14.....is 129.Find the value of n .		<u>1</u>
12.	If the distance between the points $(4, p)$ and $(1, 0)$ is 5, then find the value of p .		<u>1</u>
13.	If the angle between two radii of a circle is 130° , then what is the angle between the tangents at the end points of radii at their point of intersection?		<u>1</u>
14.	If the circumference of a circle is 44 cm, then what will be the area of circle?		<u>1</u>
15.	What is ratio of total sphere area of hemisphere to square of the radius?		<u>1</u>
16.	What is the length of the tangent drawn from a point 8 cm away from the centre of a circle of radius 6 cm ?		<u>1</u>

SECTION-II

Case study-based question are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark.

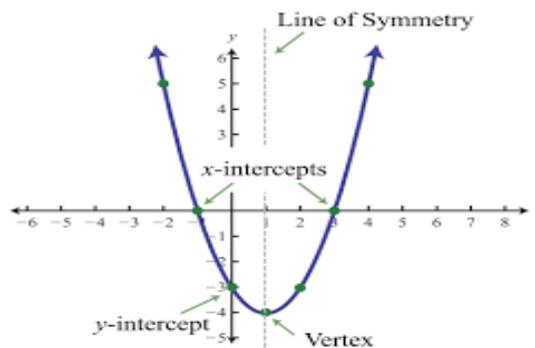
17.	<p>Case Study:-1</p> <p>Ajay, Bhigu and Colin are friend since childhood. They always went to sit in a row in the classroom. But teacher does not allow them and rotate the seats row-wise everyday. Bhigu is very good in maths and he does distance calculation everyday. He consider the centre of class 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.</p>		<u>4</u>
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	<p>(i) What are coordinates of point A? (a) (2,2) (b) (2,-2) (c) (-2,2) (d) (-2,-2)</p> <p>(ii) What is distance of point A from origin? (a) 8 (b) $2\sqrt{2}$ (c) 4 (d) $4\sqrt{2}$</p> <p>(iii) What is the distance between A and b? (a) $3\sqrt{19}$ (b) $3\sqrt{5}$ (c) $\sqrt{17}$ (d) $2\sqrt{5}$</p> <p>(iv) What is the distance between B and C? (a) $3\sqrt{19}$ (b) $3\sqrt{5}$ (c) $2\sqrt{17}$ (d) $2\sqrt{5}$</p> <p>(v) A point D lies on the line segment between points A and B such that AD: DB = 4: 3. What are the coordinates of point D? (a) $(\frac{10}{7}, \frac{2}{7})$ (b) $(\frac{2}{7}, \frac{7}{7})$ (c) $(-\frac{10}{7}, -\frac{2}{7})$ (d) $(\frac{-2}{7}, \frac{-7}{7})$</p>	
<p>18.</p>	<p>Case Study:-2</p> <p>An engineer plans to make all the pillars of the Metro green with plants to make these beautiful and to contribute for healthy environment as shown in the picture. Observe the picture and answer the questions if dimension of one pillar is 1.5 m X 1.5 m X 20 m.</p>  <p>(i) The shape of the pillars is a) Rectangle b) Cube c) Cuboid d) Cylinder</p> <p>(ii) By using which formula he can calculate the surface area of the pillar? a) $A = 2(lb + bh + hl)$ b) $A = 2(lb + hl)$ c) $A = 2h(l + b)$ d) $A = lb + bh + hl$</p> <p>(iii) The lateral surface area of one pillar is a) $100m^2$ b) $120 m^2$ c) $165 m^2$ d) $82.5 m^2$</p> <p>(iv) How much cement is used to fill the pillar? a) $44 m^3$ b) $45 m^3$ c) $450 m^3$ d) $440 m^3$</p> <p>(v) Find the cost of the plantation if it costs Rs.50 per m². a) Rs.6225 b) Rs. 6000 c) Rs. 5000 d) Rs. 4100</p>	<p><u>4</u></p>

19. Case Study:-3

4

A park has swings made of rubber and iron chain. Sachin who is studying in class X have noticed that this is a Mathematical shape, he has learned in Maths class. Following questions raised in his mind. Answer the questions by observing both pictures :



- (i) Name the shape in which the wire is bent.
 - a) Spiral
 - b) ellipse
 - c) linear
 - d) Parabola
- (ii) How many zeroes are there for the polynomial (shape of the wire)?
 - a) 2
 - b) 3
 - c) 1
 - d) 0
- (iii) The zeroes of the polynomial are
 - a) -1 ,5
 - b) -1, 3
 - c) 3, 5
 - d) -4, 2
- (iv) What will be the expression of the polynomial?
 - a) $x^2+2x -3$
 - b) $x^2-2x +3$
 - c) $x^2- 2x -3$
 - d) x^2+2x+3
- (v) What is the value of the polynomial if $x = 1$?
 - a) -4
 - b) 5
 - c) -5
 - d) 6

20. Case Study:-4

4

Data of height of class 10th students was collected and organized as the following frequency distribution table ,observe the median class and modal class.Height (in cm).

Height	140-145	145-150	150-155	155-160	160-165	165-170
Freq.	5	15	25	30	15	10

- (i) What is the upper limit of median class?
 - (a) 150 cm
 - (b) 160 cm
 - (c) 155 cm
 - (d) 165 cm
- (ii) What is the value of median height?
 - (a) 145.67 cm
 - (b) 157.67 cm
 - (c) 155.83 cm
 - (d) 159.67 cm
- (iii) What is the lower limit of modal class?
 - (a) 150 cm
 - (b) 160 cm
 - (c) 155 cm
 - (d) 165 cm
- (iv) What is the value of modal height?
 - (a) 155.25 cm
 - (b) 156.25 cm
 - (c) 157.25 cm
 - (d) 159.25 cm
- (v) What is the value of mean height?
 - (a) 155.625 cm
 - (b) 156.250 cm
 - (c) 158.500 cm
 - (d) 159.275 cm

PART-B

Question No. 21 to 26 are Very short answer Type questions of 2 marks each.

<p>21.</p>	<p>Find the value of a if the distance between the points A(-3, -14) and B (a,-5) is 9 units. OR Find a relation between x and y such that the point (x, y) is equidistant from the point (3,6) and (-3,4).</p>	<p><u>2</u></p>																
<p>22.</p>	<p>Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.</p>	<p><u>2</u></p>																
<p>23.</p>	<p>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. OR Prove that a parallelogram circumscribing a circle..</p>	<p><u>2</u></p>																
<p>24.</p>	<p>Prove that: $\frac{\cos^3\theta + \sin^3\theta}{\cos\theta + \sin\theta} + \frac{\cos^3\theta - \sin^3\theta}{\cos\theta - \sin\theta} = 2$ OR If $5x = \sec\theta$ and $\frac{5}{x} = \tan\theta$, then find the value of $5\left(x^2 - \frac{1}{x^2}\right)$.</p>	<p><u>2</u></p>																
<p>25.</p>	<p>A ladder 15m long reaches a window which is 9m above the ground on one side of a street .Keeping its foot at the same point ,the ladder is turned to the other side of the street to reach window 12m high .find the width of the street.</p>	<p><u>2</u></p>																
<p>26.</p>	<p>If the HCF of 65 and 117 is in the form of (65m-117), then find the value of m.</p>	<p><u>2</u></p>																
<p>Question No. 27 to 33 are Short Answer Type questions of 3 marks each</p>																		
<p>27.</p>	<p>Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1st and 4th) to the product of means (2nd and 3rd) is 5:6.</p>	<p><u>3</u></p>																
<p>28.</p>	<p>Prove that $5 - \frac{3}{7\sqrt{3}}$ is irrational number. OR On a morning walk, three persons step off together and their steps measure 40cm, 42 cm and 45cm respectively. At what minimum distance each should walk so that each can cover the same distance in complete steps</p>	<p><u>3</u></p>																
<p>29.</p>	<p>If mode of the following data is 32.5 and the sum of frequencies is 71, then find the missing frequencies <i>x</i> and <i>y</i>.</p> <table border="1" data-bbox="186 1711 1404 1858"> <tr> <td>Class interval</td> <td>25-29</td> <td>30-34</td> <td>35-39</td> <td>40-44</td> <td>45-49</td> <td>50-54</td> <td>55-59</td> </tr> <tr> <td>Freq.</td> <td>x</td> <td>22</td> <td>y</td> <td>8</td> <td>7</td> <td>3</td> <td>2</td> </tr> </table>	Class interval	25-29	30-34	35-39	40-44	45-49	50-54	55-59	Freq.	x	22	y	8	7	3	2	<p><u>3</u></p>
Class interval	25-29	30-34	35-39	40-44	45-49	50-54	55-59											
Freq.	x	22	y	8	7	3	2											

OR

Find the missing frequencies f_1, f_2 and f_3 in the following distribution ,when it is given that $f_2 : f_3 = 4 : 3$, and mean is 50.

Class int.	0-20	20-40	40-60	60-80	80-100	Total
Freq.	17	f_1	f_2	f_3	19	120

30. Solve x : $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}, x \neq 0, a \neq 0, b \neq 0, x \neq -(a + b).$ **3**

31. In a right angle triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. **3**

OR

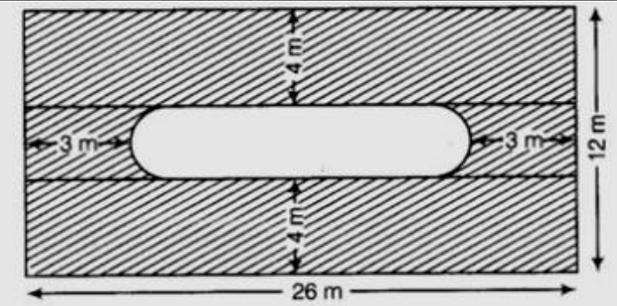
If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.

32. 90 cards numbered from 1 to 90 are placed in a box. If one card is drawn at random from the box find the probability that it is:
 (i) a two-digit number (ii) a perfect square (iii) a number divisible by 5 **3**

OR

Red queen and a black jack are removed from a pack of 52 playing cards. Find the probability that the card drawn from the remaining cards is:
 (i) a red card (ii) neither a jack nor a king (iii) either a king or a queen.

33. Find the area shaded region. **3**



Question No. 34 to 36 are Long Answer Type questions of 5 marks each

34. The angle of elevation of an airplane from a point on the ground is 60° . After a flight of 30 seconds the angle of elevation becomes 30° . If the airplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of airplane. **5**

OR

The angle of elevation of cloud from a point 60m above a lake is 30° and the angle of depression of reflection of the cloud in the lake is 60° find the length of cloud from the surface of the lake.

