

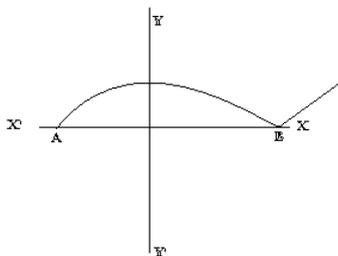
**Sample Paper – 2010**  
**Class – X**

**Subject – Mathematics**  
**Time: 3 hours**

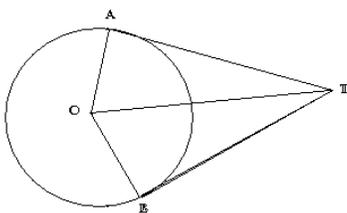
**M.M:80**

**Section-A (1x10=10)**

1. State the fundamental theorem of arithmetic.
2. The graph of  $y=f(x)$  is given below. Find the number of zeroes of  $f(x)$

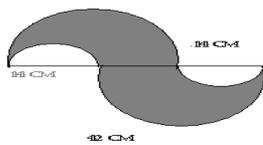


3. For what value of  $K$  the quadratic equation  $x^2-kx+4=0$  has equal roots.
4. Write the next term of AP  $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$
5. If  $\triangle ABC \sim \triangle DEF$  and  $\angle A=97^\circ$   $\angle E=53^\circ$  then write the measure of  $\angle C$ .
6. In figure if  $\angle ATO=40^\circ$  find  $\angle AOB$



7. Find the value of  $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 88^\circ \cos 89^\circ \cos 90^\circ$ .

8. Find the perimeter of shaded region



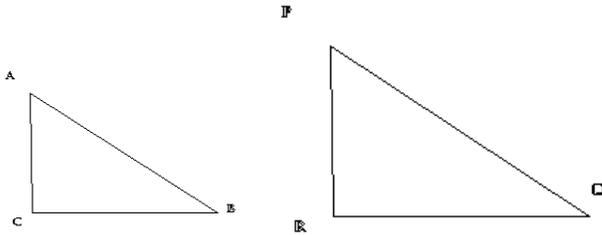
9. Card each marked with one of the numbers 4, 5, 6, 7.....20 are placed in a box and mixed thoroughly one card is drawn of random from box. What is the possibility of getting not prime numbers?

10. If the mean of the following distribution is 27 find the value of p.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	8	p	12	13	10

**Section B (2\*5=10)**

11. If  $\angle B$  and  $\angle Q$  are acute angles such that  $\sin B = \sin Q$  then prove that  $\angle B = \angle Q$ .



12. Find the roots of the following equation.

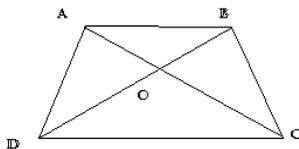
$$\left(\frac{1}{x+4}\right) - \left(\frac{1}{x-7}\right) = \frac{11}{30} \quad x \neq -4, 7$$

**OR**

Find the roots of the equation  $5x^2 - 6x - 2 = 0$  by method of completing the square.

13. In fig ABC and DBC are two triangles on the same base BC. If AD intersects BC at O show that.

$$\text{Ar } \Delta ABC / \text{ar } \Delta DBC = AO / DO.$$



14. The letter is chosen from the word MATHEMATICS. what is the probability that it is not a vowel?

15. Find the value of 'P' for which the points (-5, 1), (1, P) and (4, -2) are collinear.

**SECTION-C (3\*10=30)**

16. prove that  $\sqrt{3}$  is irrational number

17. Check whether the polynomial  $x^2+3x+1$  is a factor of the polynomial  $3x^4+5x^3-7x^2+2x+2$

**OR**

If two zeroes of the polynomial  $x^4+3x^3-20x^2-6x+36$  are  $-\sqrt{2}$  and  $\sqrt{2}$ . Find the other zeroes.

18. For what value of 'K' will the following pair of linear equations have infinitely many solutions.

$$Kx+3y=K-3$$

$$12x+Ky=K$$

19. Find the ratio in which the  $3x+y-9=0$  divides the line segment joining the point (1, 3) and (2, 7).

20. Find sum of first 25 terms of an AP whose  $n^{\text{th}}$  term is given by  $a_n=7-3n$ .

**OR**

Which term of the AP 3, 15, 27, 39.....will be 132 more than it is 54<sup>th</sup> term?

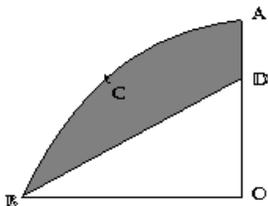
21. Find the point on the x axis which is equidistant from (2,-5) and (-2, 9).

22. In a right triangle ABC, right angled at B, if  $\tan A=1$  then verify that  $2\sin A \cos A=1$ .

23. ABCD is a trapezium in which  $AB \parallel DC$  and its diagonals intersect each at the point O. show that  $AO/BO=CO/DO$ .

24. Draw a triangle with  $BC=6\text{cm}$ ,  $\angle B=60^\circ$ ,  $\angle A=75^\circ$  then, construct a triangle whose side are  $\frac{5}{3}$  times the corresponding side ABC and point C as a common vertex.

25. In fig OACD is a quadrant of a circle with centre o and radius 3.5 cm. If  $OD=2\text{cm}$  find the area of the shaded region.



**OR**

2 cubes each of volume  $64\text{cm}^3$  are joined end to end. find the surface area of the resulting cuboids.

**Section D (6\*5=30)**

26. Some students arranged a picnic. The budget for food was Rs.240. because four students of group failed to go, the cost of food to each student got increased by rs.5. how many students went for picnic?

**OR**

A motor boat whose speed is 18 Km/hr in still water takes 1 hour more to go 24Km upstream than to return down-stream to same spot. find the speed of stream.

27. In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. Prove the converse of it

Using the above proved theorem.  $\Delta ABC$  is isosceles triangle with  $AC=BC$ .if  $AB^2=2AC^2$ . Prove that  $ABC$  is an rt angled triangle.

**OR**

The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. Prove it.

Use the above theorem the area of two similar triangles is  $81\text{cm}^2$  and  $144\text{cm}^2$  if the largest side of smaller triangle is 27cm. find the largest side of larger  $\Delta$ .

28. The radii of the ends of the frustum of cone 45cm high are 28cm and 7cm. Find the volume and total surface area.(take  $\pi=22/7$ ).

29. If the angle of elevations of a cloud from a point 12 metres above a lake is  $\alpha$  and angle of depression of it's reflection in lake is  $\beta$ . Prove that the height of cloud is  $h (\tan\beta + \tan\alpha) / (\tan\beta - \tan\alpha)$ .

30. If the median of distribution given below is 28.5. find the value of X and Y.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	5	x	20	15	y	5	60