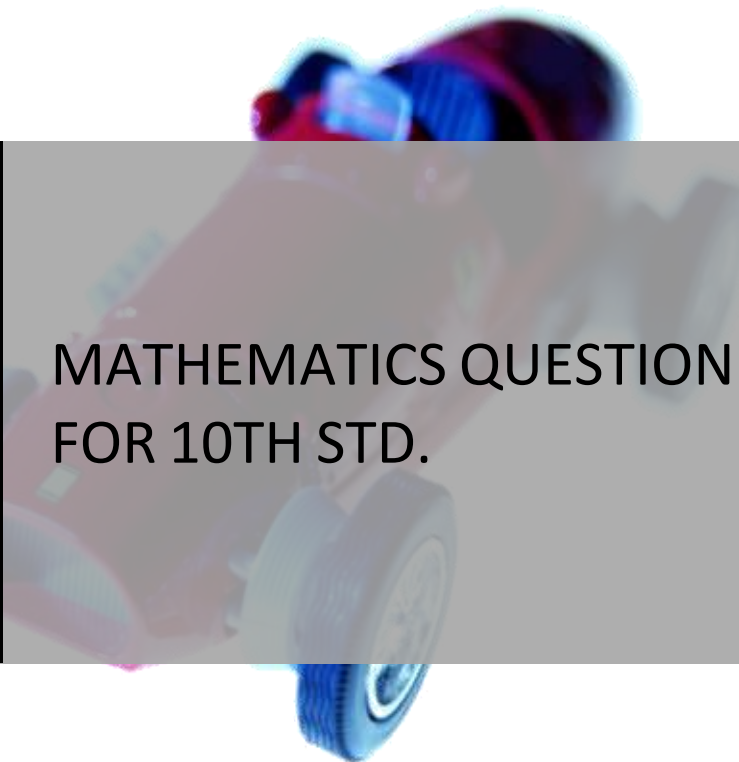


10/6/2019



MINORITY  
MORARJI DESAI  
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DIST

## MATHEMATICS QUESTION PAPERS FOR 10TH STD.

## MODEL QUESTION PAPER-2

Subject: Mathematics

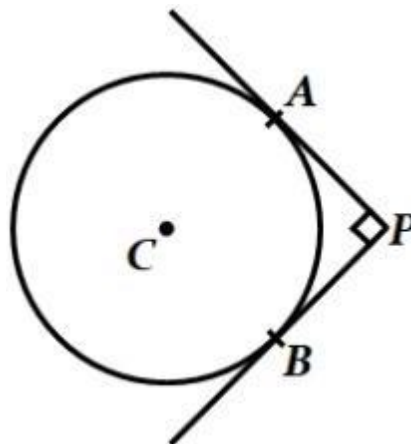
Subject code: 81E

Time : 3 hours

Max.marks: 80

I. Choose the correct answer given below -----  $1 \times 8 = 8$

- How many solutions of the following pair of linear equations have:  $x+2y-8=0$  &  $2x+4y=16$   
a. Only one      b. 0      c. Infinitely many      d. None
- If 1 is a root of the equations  $ay^2+ay+3=0$  and  $y^2+y+b=0$ , then  $ab$  equals: .....  
a. 3      b.  $-\frac{3}{2}$       c.  $-3$       d. 6
- If  $\cos A = \frac{7}{25}$ , Then the value of  $\sin A$  is.....  
a.  $\frac{25}{24}$       b.  $\frac{25}{7}$       c.  $\frac{24}{25}$       d. 1
- The mid-point of segment  $AB$  is the point  $P(0,4)$ . If the coordinates of  $B$  are  $(-2,3)$  then the coordinates of  $A$  are  
a.  $(2, 5)$       b.  $(-2, -5)$       c.  $(2, 9)$       d.  $(-2, 11)$
- In figure,  $PA$  and  $PB$  are two tangents drawn from an external point  $P$  to a circle with centre  $C$  and radius  $4\text{ cm}$ . If  $PA \perp PB$ , then the length of each tangent is:  
a. 3cm      b. 4cm      c. 5cm      d. 6cm



6. If  $k, 2k-1$  and  $2k+1$  are three consecutive terms of an A.P., the value of  $k$  is

- a. 2      b. 3      c. -3      d. 5

7. In a test cricket match, winning chances for a team is 0.76. Then what is the probability of losing the game?

- a. 0      b. 1      c. 0.24      d. 0.65

8. If  $\tan A = \frac{3}{4}$  and  $A+B=90^\circ$ . Then the value of  $\cot B$  is ....

- a.  $\frac{4}{3}$       b.  $\frac{5}{3}$       c.  $\frac{3}{4}$       d.  $\frac{5}{4}$

II. Answer the following questions

1 x 8 = 8

9. Express 210 as its product of prime factors.

10. For what value of  $k$  the quadratic equation  $x^2 - kx + 4 = 0$  has equal roots?

11. If the mid-point of the line segment joining the points  $P(6, b-2)$  and  $Q(-2, 4)$  is  $(2, -3)$ , find the value of  $b$ .

12. The surface area of a sphere is  $616 \text{ cm}^2$ . Find its radius.

13. Express 140 as its product of prime factors.

14. If  $A$  is an event of random experiment. Such that  $P(A):P(A^c)=1:2$ . Find the value of  $P(A)$

15. Find :  $\tan^2 45^\circ + \cot^2 45^\circ$ .

16. The radii of the circular ends of a bucket of height  $40 \text{ cm}$  are  $24 \text{ cm}$  and  $15 \text{ cm}$ . Then find its slant height of the bucket.

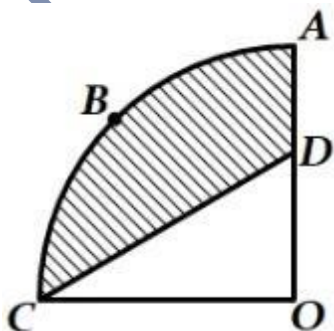
III. Answer the questions

2 x 8 = 16

17. Prove that  $2+\sqrt{3}$  is an irrational number.

18. Solve  $x+y=8$  &  $2x-y=1$ .

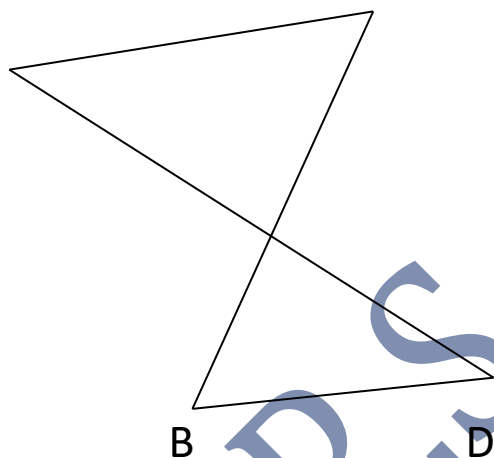
19. In figure,  $OABC$  is a quadrant of a circle with centre  $O$  and radius  $3.5 \text{ cm}$ . If  $OD=2 \text{ cm}$ , find the area of the shaded region.



OR

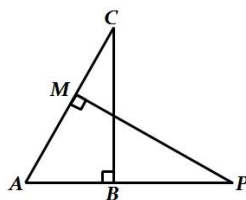
Find the area of a quadrant of a circle, where the circumference of circle is 44 cm.

20. A pole casts a shadow of length  $2\sqrt{3}$  m on the ground, when the sun's elevation is  $60^\circ$ . Find the height of the pole.
21. In the figure given below,  $AC$  is parallel to  $BD$ ,  
Is  $\frac{AE}{CE} = \frac{DE}{BE}$ ? Justify your answer.



OR

In the fig.,  $ABC$  and  $AMP$  are right angled at  $B$  and  $M$  respectively. Prove that  $CA \times MP = PA \times BC$



22. Find all the zeroes of the polynomial  $x^3 + 3x^2 - 2x - 6$ , if two of its zeroes are  $-\sqrt{2}$  and  $\sqrt{2}$ .
23. Construct a pair of tangents to the circle of radius 3cm at the end point of its diameter.

24. Without using trigonometric tables, find the value of the following expression:

$$\frac{\sec(90^\circ - \theta) \cdot \operatorname{cosec} \theta - \tan(90^\circ - \theta) \cot \theta + \cos 25^\circ + \cos 65^\circ}{3 \tan 27^\circ \cdot \tan 63^\circ}$$

IV. Solve the following problems

$$3 \times 9 = 27$$

25. The numerator of a fraction is 3 less than its denominator. If 2 is added to both the numerator and the denominator, then the sum of the new fraction and original fraction is  $\frac{29}{20}$ . Find the original fraction.

OR

A train travels at a certain average speed for a distance of 54 km and then travels a distance of 63 km at an average speed of 6 km/h more than the first speed. If it takes 3 hours to complete the total journey, what is its first speed?

26. What are the quotient and the remainder, when  $3x^4 + 5x^3 - 7x^2 + 2x + 2$  is divided by  $x^2 + 3x + 1$ ?
27. Solve the following pair of equations:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

OR

Solve for  $x$  and  $y$ :

$$\frac{ax}{b} - \frac{by}{a} = a + b$$

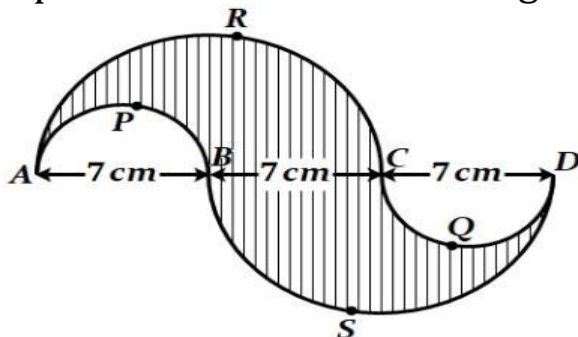
$$ax - by = 2ab$$

28. Show that  $A(-3, 2)$ ,  $B(-5, -5)$ ,  $C(2, -3)$  and  $D(4, 4)$  are the vertices of a rhombus.

OR

If  $P(x, y)$  is any point on the line joining the points  $A(a, 0)$  and  $B(0, b)$ , then show that  $\frac{x}{a} + \frac{y}{b} = 1$ .

29. Prove that “the tangent at any point of a circle is perpendicular to the radius through the point of contact”.
30. In figure,  $APB$  and  $CQD$  are semi-circles of diameter  $7\text{ cm}$  each, while  $ARC$  and  $BSD$  are semi-circles of diameter  $14\text{ cm}$  each. Find the perimeter of the shaded region.



31. Draw ogive for the given data:

Time period(in minutes)	0-15	15-30	30-45	45-60	60-75
Goals	3	6	11	8	3

32. Find the value of  $x$  and  $y$  in the table, when its median is 30.77, Sum of all frequency  $(N)=50$  &  $LRL=30$ .

C.I	10-20	20-30	30-40	40-50	50-60
f	11	X	13	Y	4

OR

Find the mean for the following data:

Marks range	0-4	5-9	10-14	15-19	20-24
Students	3	5	7	4	6

33. Construct a triangle  $ABC$  in which  $AB=5\text{cm}$ ,  $\angle CAB=60^\circ$ , &  $BC=5\text{cm}$ . Construct another triangle similar to it with  $\frac{7}{5}$ th of the corresponding sides.

V. Solve

$$4 \times 4 = 16$$

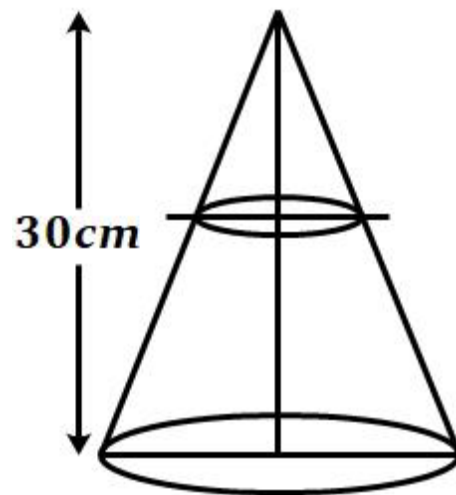
34. Solve pair of linear equations graphically :  $x+y=1$  &  $2x+3y=0$ .
35. Yasmeen saves Rs.32 during the first month, Rs.36 in the second month and Rs.40 in the third month. If she continues to save in this manner, in how many months she will save

Rs.2000, which she has intended to give for the college fee of her maid's daughter. What value is reflected here.

OR

The first and the last terms of an A.P. are 8 and 350 respectively. If its common difference is 9, how many terms are there and what is their sum?

36. An aeroplane is flying at a height of 300 m above the ground. Flying at this height, the angles of depression from the aeroplane of two points on both banks of a river in opposite directions are  $45^\circ$  and  $60^\circ$  respectively. Find the width of the river.
37. In figure is shown a right circular cone of height 30 cm. A small cone is cut off from the top by a plane parallel to the base. If the volume of the small cone is  $\frac{1}{27}$  of the volume of given cone, find at what height above the base is the section made.



$$5 \times 1 = 5$$

VI. Prove the following

38. State and prove Pythagoras theorem.