

# CLASS X SAMPLE PAPER MATHEMATICS

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**Max.Marks:90**

## Section-A

1. If 3 is a root of the equation  $3x^2 + px + 10 = 0$ , find 'p'.
2. Find 15<sup>th</sup> term given  $T_n = 4 - 5n$ .
3. Find the length of the tangent drawn to a circle of radius 3 cm from a distance of 10 cm from the circle.
4. At a certain time of the day, a pole of height 60 m casts a shadow of  $20\sqrt{3}$  m. Find the angle of elevation of the Sun.

## Section-B

5. Draw a line segment  $AB = 8$  cm and divide it in the ratio 2 : 3. Measure each part.
6. Find a point on  $x$ -axis which equidistant from the points (3, 5) and (4, -6).
7. If the distance between (2, 5) and (x, -7) is 13 units find 'x'.
8. What is the probability that two friends have birthday on (i) same date and (ii) different dates?
9. Two dice are tossed simultaneously. What is the probability that both show identical numbers?
10. A circle has radius 3.5 cm. Find Area of the minor segment of the sector  $60^\circ$ . ( $\sqrt{3} = 1.73$ ,  $\pi = 3.14$ )

## Section-C

11. 4<sup>th</sup> term of an A.P. is 17 and 10<sup>th</sup> term is 12 more than the 7<sup>th</sup> term. Find the A.P.
12. Solve for  $x$ :  $4x^2 - 20x + 9 = 0$  by completing the square method.
13. Find the sum of all numbers between 200 and 400 that leave remainder 4 when divided by 6.
14. Prove that perpendicular to the radius at the circumference is tangent to the circle.

15. A circle touches side BC of the  $\Delta ABC$  at D and sides AB and AC produced at P and Q respectively. Prove that  $AP = \frac{1}{2}$  Perimeter of  $\Delta ABC$
16. In what ratio  $x$ -axis divides the line joining (4, 8) and (5, -6)? Also find the point of intersection.
17. Angles of depression of two boats at distances of 'p' and 'q' metres on the same side of the light house were found to be complementary. Prove that height of the light house is  $\sqrt{pq}$  meters.
18. AB and CD are two perpendicular diameters of a circle with centre 'O' and radius 7 cm. With OA as diameter a circle is drawn touching the bigger circle at A. BC and BD are joined. Find the area of the circle not included in the smaller circle and  $\Delta BCD$ .
19. A racing track of width 3.5 m has two straight stretches of each 30 m length and semicircular ends. The inner diameter of the semi-circular part is 28 cm. Find the area of the track and the cost of maintaining it at Rs.15/m<sup>2</sup>.
20. Side other than hypotenuse of a right triangle measure 7 cm and 24cm. Two semi-circles are drawn using hypotenuse and the shorter side as diameters. Find the area of the region lying outside the smaller semi-circle.

### Section-D

21. For what value of 'k' the area of the triangle whose vertices are (k, 3k+1) (3, -1) and (-5, 6) will have area 28.5 square units?
22. A circle of radius 3 cm is inscribed in a circle that divides one of the sides into two segments of 9 cm and 5 cm at the point of contact. Find the length of the other two sides.
23. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre.
24. Two pipes can fill a tank in  $7\frac{1}{5}$  hours. If one pipe takes 6 hours longer to fill the tank find the time taken by the pipes separately .
25. Shama purchased NSCs every year whose value exceeded the previous year's purchase by Rs.500. After ten years if she has saved Rs.72,500, find the value of the certificate purchased in the first year.
26. Students of a class planned for a picnic and the budget for food was Rs. 5000. Five students -who wanted to help some poor students pay their exam fees by their contribution instead- refused to join. As a result each of the rest of the students had to pay Rs. 50 more. How many students attended the picnic? What is the value reflected?

27. From a window 20 m above the ground, the angles of elevation and depression of top and bottom of a building on the other side of the street were found to be  $60^\circ$  each. Find the height of the building and the width of the street.
28. Twenty cards are numbered 1,2,3.....20 and mixed thoroughly. One card is drawn at random. What is the probability that the drawn card bears (i) a prime number (ii) an even number (iii) a number that is a square (iv) a number divisible by both 2 & 3 on it ?
29. A cylindrical vessel of radius 12 cm and height 66 cm contains ice cream to the brim. This is to be filled into cones that have hemispherical top of radius 3 cm. If the total height of the cones is 8 cm, find the number of such cones required to empty the cylindrical vessel.
30. Volume of a bucket-in the form of a frustum of a cone- is  $39744 \text{ cm}^3$ . The radii of top and bottom are 28 cm and 14 cm. Find the curved surface area of the bucket correct up to two places of decimal.
31. A wooden cylinder of radius 7 cm is 35 cm long. From its ends a hemisphere and a cone up to a height of 15 cm are scooped out. Find the surface area of the remaining solid.(Correct up to two places of decimal).