

CLASS X SAMPLE PAPER MATHEMATICS

Max.Marks.90

Section-A

1. PA and PB are tangents to a circle and CD is a tangent at E intersecting PA and PB at C and D respectively. If PA =10.5 cm, find the perimeter of Δ PCD.
2. A light house is 100 m high. The angles of depression of two boats on the opposite sides of the light house were each found to be 45° . Find the distance between the boats.
3. First term of an A.P. is -5 and the common difference is 4. Find an expression for the n^{th} term.
4. Comment on the nature of the roots of equation $3x^2-5x-2=0$.

Section-B

5. A tangent is drawn to a circle of radius 5 cm from a distance of 13 cm from the centre. Find the length of the tangent.
6. Find the distance between the points (-5,3) and (6,2)
7. Find the coordinates of the midpoint of the line joining the points (-4,5) and (8,3).
8. A square and a circle have equal perimeter of 44 cm. Which has more area and by how much?
9. 30 cards are numbered 1,2,3,4...30. One card is drawn at random. What is the probability that the drawn card bears a number which is a multiple of 7?
10. A bag contains 6 blue balls and 4 red balls. By adding some more blue balls the probability of drawing blue ball is increased by $\frac{1}{15}$. Find the number of blue balls added.

Section-C

11. Which term is the first negative term of the A.P. 56,51,46,41,.....?
12. Solve for 'x': $x^4 - 10x^2 + 9 = 0$

13. Divide 24 into two parts such that square of the larger part exceeds the square of the smaller part by 58.
14. Prove that tangents drawn to a circle from an exterior point are equal.
15. PA and PB are tangents to a circle with centre 'O' and AB is a chord intersecting OP at C. Prove that $\angle APB = 2\angle OAB$.
16. Show that the points $(-3,2)$, $(-5,-5)$, $(2,-3)$ and $(4,4)$ taken in order are vertices of a parallelogram.
17. Angles of elevation of two points on the opposite sides of a light house at distances of 'a' and 'b' metres respectively were found to be complimentary. Prove that height of the light house is \sqrt{ab} metres.
18. Find the area of minor segment of a circle of radius 7 cm and central angle 60° . ($\sqrt{3}=1.73$)
19. In a triangle $\angle A = 90^\circ$, $AB = 12$ cm, $BC = 20$ cm. Three semicircles have been drawn using each side as diameter. Find the area of the region not included in the largest semicircle.
20. A copper wire of diameter 4 mm is wound round a cylinder 60 cm long and 14 cm diameter so as to cover the entire curved surface. Find the length of the wire and weight of the wire if density of copper is 8 gm/cm^3 .

Section-D

21. A person bought some articles for Rs.1500. Five of them were damaged and he sold the rest at Rs. 5 more than what he paid for each thereby making a profit of Rs.150 on the whole transaction. Find the number of articles bought.
22. Fifteen coconut plants are planted at distance of 10 m each in a line and 10 m away from the first well-in the line of plants- is a well and a bucket near it. A gardner has to water the plants one by one starting from the well. Find the distance covered by him in watering all the plants.
23. Solve: $\left(\frac{7y-1}{y}\right)^2 - 3\left(\frac{7y-1}{y}\right) - 18 = 0$
24. An incircle of radius 4 cm of the $\triangle ABC$ divides one of the sides into two segments measuring 12 cm and 4 cm. Find the lengths of the other two sides of the triangle.
25. PT is a tangent to a circle with centre 'O' and PB is a secant intersecting the circle at A and B, Prove that $PT^2 = PA \cdot PB$
26. The angle of elevation of the top of a tower from a point on the ground is 60° . From a point 15 m vertically above the first the angle of elevation is found to be 45° . Find the height of the tower. ($\sqrt{3} = 1.73$)

27. A child's game has 12 triangles of which 5 are blue and rest red, 18 squares of which 8 are blue rest are red. One piece is drawn at random. Find the probability that the drawn piece is a (i) triangle, (ii) square, (iii) square with red colour (iv) triangle with blue colour.
28. A building is in the form of a cylinder surmounted by a hemispherical dome and contains $41\frac{19}{21}$ m³ of air. If the internal diameter is equal to the total height of building find the height of the building.
29. A cone has a height of 40 cm. A small cone is cut off from the top through a plane parallel to the base. If the volume of this cone is $\frac{1}{125}$ of the volume of original cone find the height at which the section has been made.
30. Four points A(6,3), B(-3,5), C(4,-2) and D(x,3x) are such that $\frac{\text{Area of } \triangle DBC}{\text{Area of } \triangle ABC} = \frac{1}{2}$ find 'x'.
31. A cylindrical vessel 18 m radius 36 m high contains sand to the brim. This sand is emptied on to the ground to form a conical heap of height 27 m. Find the slant height of the heap.