

CBSE Class 10 Maths Sample Paper SA 2 Set 4

SUBJECT: MATHEMATICS

CLASS : X

MAX. MARKS : 90

DURATION : 3 HRS

General Instructions:

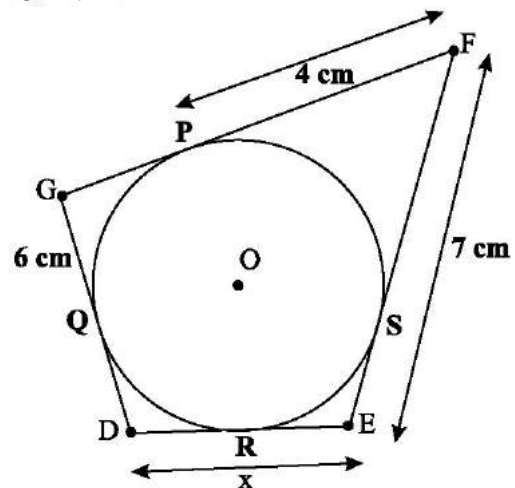
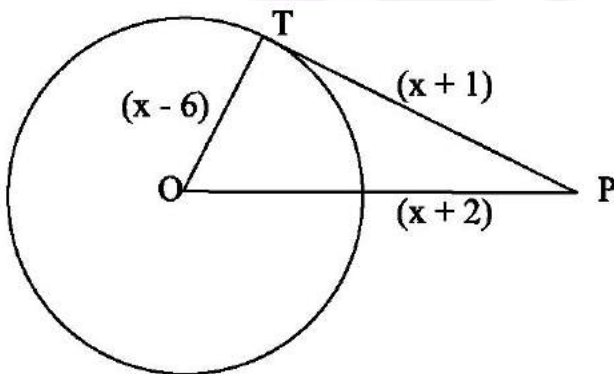
1. All questions are compulsory.
2. Question paper is divided into four sections: Section A consists 4 questions each carry 1 marks, Sections B consists 6 questions each carry 2 marks, Sections C consists 10 questions each carry 3 marks and Sections D consists 11 questions each carry 4 marks.
3. There is no overall choice.
4. Use of Calculator is prohibited.

SECTION – A

1. Find the value of k for which equation $9x^2 + 8kx + 8 = 0$ has equal roots.
2. In a circle with centre O , AB and CD are two diameters perpendicular to each other. Find the length of chord AC .
3. A tower subtends an angle of 30° at a point on the same level as its foot. At a second point 'h' metres above the first, the depression of the foot of the tower is 60° . Find the height of the tower.
4. Two different dice are tossed together. Find the probability that the product of the two numbers on the top of the dice is 8.

SECTION – B

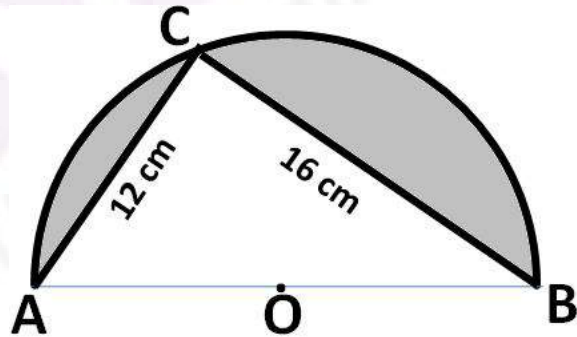
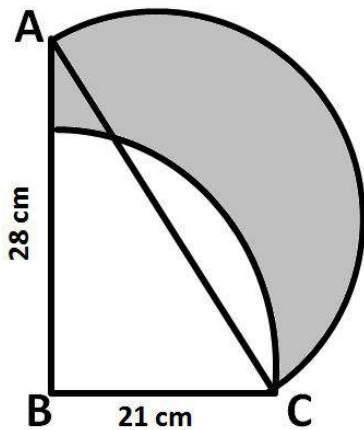
5. Solve the equation: $4x^2 - 4a^2x + (a^4 - b^4) = 0$
6. In the below figure, find the actual length of sides of $\triangle OTP$.



7. In the above sided figure, find the value of x .
8. The sum of 4th term and 8th term of an AP is 24 and the sum of 6th and 10th terms is 44. Find the AP.
9. If the points $A(-3, 0)$, $B(1, -3)$ and $C(4, 1)$ are the vertices of an isosceles right-angled triangle, find the area of this triangle.
10. For what value of p are the points $A(-3, 9)$, $B(2, p)$ and $C(4, -5)$ are collinear.

SECTION – C

11. If the 5th and 12th terms of an AP are -4 and -18 respectively, find the sum of first 20 terms of the AP.
12. Find the ratio in which the line segment joining $A(1, -5)$ and $B(-4, 5)$ is divided by the x -axis. Also find the coordinates of the point of division.
13. A jar contains 54 marbles, each of which is blue, green or white. If a marble is drawn at random from the jar, the probability that it is green is $\frac{1}{3}$ and that of getting a blue marble is $\frac{4}{9}$. Find the number of white marbles in the jar.
14. Solve the equation: $4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0$
15. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.
16. A *gulab jamun*, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 *gulab jamuns*, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm.
17. In the below figure, ABC is a right angled triangle at B, $AB = 28$ cm and $BC = 21$ cm. With diameter AC a semicircle is drawn and with BC as radius a quarter circle is drawn. Find the area of the shaded region correct to two decimal places.



18. In the above right-sided figure, O is the centre of a circular arc and AOB is a straight line. Find the perimeter and the area of the shaded region. (use $\pi = 3.142$)
19. A sphere of diameter 12 cm, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water level in the cylindrical vessel rises by $3\frac{5}{9}$ cm. find the diameter of the cylindrical vessel.
20. A statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45° . Find the height of the pedestal.

SECTION – D

21. Find the value of k for which the area formed by the triangle with vertices $A(4, 4)$, $(3, k)$ and $C(3, -2)$ is 7 square units.

22. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are in the top row?
23. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected?
24. A train covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hr more, it would have taken 30 minutes less for the journey. Find the original speed of the train.
25. The angle of elevation of cloud from a point 120m above a lake is 30° and the angle of depression of the reflection of the cloud in the lake is 60° . Find the height of the cloud.
26. Five cards—the ten, jack, queen, king and ace of diamonds, are removed from the well-shuffled 52 playing cards. One card is then picked up at random. Find the probability of getting
- neither a heart nor a king
 - a black card or an ace.
 - either a heart or a spade card
 - a red king card
27. Prove that “The tangent at any point of a circle is perpendicular to the radius through the point of contact”.
28. Draw a triangle ABC with side $BC = 7$ cm, $\angle B = 45^\circ$, $\angle A = 105^\circ$. Then, construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of $\triangle ABC$.
29. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.
30. Due to sudden floods in Chennai, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost. The tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making such 100 tents. Also, find the cost of the canvas of 100 tents at the rate of Rs 300 per m^2 . What values are shown by these associations?
31. A metallic right circular cone 20 cm high and whose vertical angle is 60° is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter $\frac{1}{16}$ cm, find the length of the wire.