10th CBSE Sample paper Mathematics: Set: 02

SECTION - A

1. The quadratic equation whose roots are real and equal is :
(A) $2x^2 - 4x + 3=0$ (B) $x^2 - 4x + 4=0$ (C) $3x^2 - 5x + 2=0$ (D) $x^2-2\sqrt{2}x - 6=0$

2. 15th term of the A.P. x-7, x-2, x+3 ... is:
(A) x+63 (B) x+73 (C) x+83 (D) x+53

3. In Fig., PA is a tangent to a circle of radius 6 cm and PA=8 cm, then length of PB is (A) 10 cm (B) 18 cm (C) 16 cm (D) 12 cm

4. PQ and PT are tangents drawn from a point P to a circle with centre 0 such that ∠QPT=120° then ∠QOT is equal to
(A) 60° (B) 30° (C) 0° (D) 120°
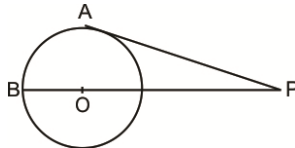
5. The Fig., shows two concentric circles with centre O. AB and APQ are tangents to the inner circle from point A lying on the outer circle. If AB=7.5 cm then AQ is equal to :
(A) 18 cm (B) 15 cm (C) 12 cm (D) 10 cm
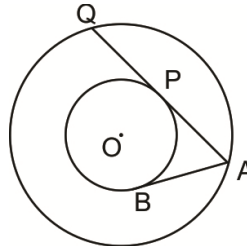
6. Quadrilateral ABCD circumscribes a circle as shown in Fig.3. The side of the quadrilateral which is equal to AP+BR is: (A) AD (B) AC (C) AB (D) _____ BC
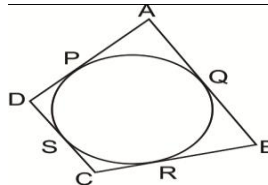
7. The total surface area of a solid hemisphere of radius 7 cm is :
(A) 447π cm^2 (B) 23 π cm^2 (C) 147π cm^2 (D) 174π cm^2

8. Area of a quadrant of circle whose circumference is 22 cm is : (π=22/7)
(A) 3.5 cm^2 (B) 3.5 cm^2 (C) .625 cm^2 (D) 17.25 cm^2

SECTION – B Question numbers 9 to 14 carry 2 marks each.

9. Find the roots of the quadratic equation $3x^2 - 14x + 8=0$.

10. Find the sum of the first 50 odd natural numbers.

11. Prove that the tangents at the ends of a diameter of a circle are parallel.

12. The difference between circumference and diameter of a circle is 135 cm. Find the radius of the circle.

13. A solid is hemispherical at the bottom and conical above. If the curved surface area of the two parts are equal, then find the ratio of the radius and height of the conical part.

14. Find the value of 's' if the point P (0, 2) is equidistant from Q (3, s) and R (s, 5).

SECTION – C : Question numbers 15 to 24 carry 3 marks each.

15. Find the perimeter of the triangle formed by the points (0, 0), (1, 0), (0, 1).

16. Find the volume of the largest cone that can be cut out of a cube whose edge is 7 cm. (π=22/7)

17. A card is drawn at random from a pack of well shuffled deck of playing cards. Find the probability that the card is (i) a king or a jack (ii) a card of spade or an ace

18. Find two positive numbers whose squares have the difference 48 and the sum of the numbers is 12.

19. If from an external point B of a circle with centre 0, two tangents BC and BD are drawn such that ∠DBC=120°, prove that BO=2BC.

20. Sum of the first n terms of an A.P. is $5n^2-3n$. Find the A.P. and also find its16thterm.

21. In Fig., triangle ABC is a right angled triangle with AB=6cm, AC=8 cm and ∠A= 0°.A circle with centre 0 is inscribed inside the triangle. Find the radius 'r'.
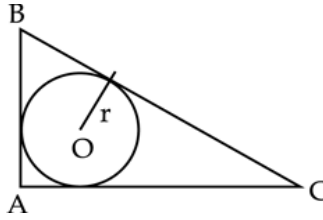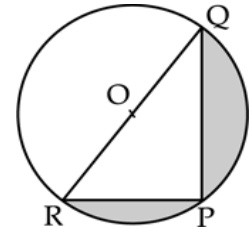

22. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.
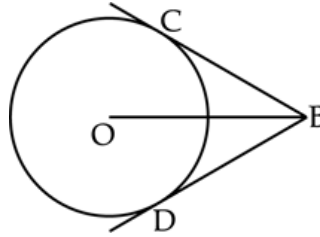
23. Find the area of shaded region in Fig.6, if PQ=16 cm, PR=12 cm and 0 is the centre of the circle. (π=3.14)

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24. Solid spheres of diameter 6 cm each are dropped into a cylindrical beaker containing some water and are fully submerged. The water in the beaker rises by 40 cm. Find the number of solid spheres dropped into the beaker if the diameter of the beaker is 18 cm.

SECTION – D : Question numbers 25 to 34 carries 4 marks each.

25. A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60°. Find the distance between the foot of the tower and the ball.

26. The midpoint of the line segment joining points A(x, y+1) and B(x+1, y+2) is C. Find the value of x and y if the coordinates of C are (3/2, 5/2).

27. Find the area of rhombus ABCD if its vertices are A (3, 0), B (4, 5) C (-1, 4) D (-2, -1).

28. King, queen and jack of hearts are removed from a pack of 52 playing cards and then the pack is well shuffled. A card is drawn from the remaining cards. Find the probability of getting a card of(i) hearts (ii) a queen (iii) not a king

29. Two pipes can together fill a tank in 40/13 minutes. If one pipe takes 3 minutes more than the other to fill it, find the time in which each pipe can fill the tank.

OR

By increasing the speed of a bus by 10 km/hr, it takes one and half hours less to cover a journey of 450 km. Find the original speed of the bus.

30. 228 logs are to be stacked in a store in the following manner: 30 logs in the bottom, 28 in the next row, then 26 and so on. In how many rows can these 228 logs be stacked? How many logs are there in the last row ?

31. Prove that the lengths of the tangents from an external point to a circle are equal.

32. A container is in the form of the frustum of a cone. If its height is 16 cm and the radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the slant height of the container and also the cost of milk that the container can hold, if the cost of milk is Rs. 30/litre.   (π=3.14)

OR

Water is flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Find the time in which the level of water in the tank will rise by 21 cm.

33. A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire.

34. From the top of a hill the angles of depression of two consecutive kilometer stones due east are found to be 30° and 60°. Find the height of the hill.