CBSE ASSSIGNMENT

February 6, 2024

1 QUADRATIC EQUATIONS

1. Find the value of P, for which one root of the quadratic equation $PX^2 - 14X + 8 = 0$ is 6 times the other.

2. If the roots of the equation $\left(a^2 + b^2\right)\ x^2 - 2\left(ac + bd\right)$ x + $\left(c^2 + d^2\right) = 0$ are equal, prove that $\frac{a}{b} = \frac{c}{d}$.

3. solve for X :

$$\frac{X-1}{2X+1} + \frac{2X+1}{X-1} = 2, where x \neq \frac{-1}{2}$$

4. A takes 6 days less than B to do a work. If both A and B working together can do it in 4 days, how many days will B take to finish it ?

2 ARTHMETIC PROGRESSIONS

5. What is the common difference of an A.P. in Which $a_{21} - a_7 = 84$?

6. For what value of n, are the n^{th} terms of two $A.P$s 63,65,67,... and 3,10,17,... equal?

7. How many terms of an A.P. 9, 17,254,... must be taken to a given a sum of 636?

8. If the ratio of the sum of the first n terms of two $A.P$ s is $(7n + 1)$: $(4n + 27)$, then find the ratio of their 9^{th} terms.

3 PROBABILITY

9. The probability of selecting a rotten apple randomly from a heap of 900 apples is 0.18. What is the number of rotten apples in the heap?

10. A bag contains 15 white and some black balls. If the probability of drawing a black ball from the bag is thrice that of drawing a white ball, find the number of black balls in the bag.

11. Two different dice are thrown together. find the probability that the numbers obtained have

    (a) even sum, and

    (b) even product

4 APPLICATIONS OF GEOMETRY

12. If a tower 30m high, casts a shadow $10\sqrt{3}$ m long on the ground, then What is the angle of elevation of the sun ?

5 CIRCLES

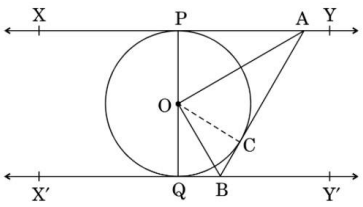
13. If the angle between two tangents drawn from an external point P to a circle of radius a and centre O,60°is then find the length of OP.

14. A circle touches all the four sides of a quadrilateral $ABCD$. prove that

$$AB + CD = BC + DA$$

15. Prove that the tangents drawn at the end point of a chord of a circle make equal angles with the chord.

16. In the figure, $X\ Y$ and $X'\ Y'$ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C, is intersecting $X\ Y$ at A and $X'\ Y'$ at B. Prove that $\angle AOB = 90°$



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

6 COORDINATE GEOMETRY

18. A line intersects the y-axis and x-axis at the points P and Q respectively. If $(2, -5)$ is the midpoint of PQ, then find the coordinates of P and Q.

19. If the distances of $P(x, y)$ from $A(5, 1)$ and $B(-1, 5)$ are equal, then prove that $3x = 2y$.

20. If the points $\mathrm{A}(k+1, 2k)$, $\mathrm{B}(3k, 2k+3)$ and $\mathrm{C}(5k-1, 5k)$ are collinear, then find the value of k.

21. In what ratio does the point $\left(\frac{24}{11}, y\right)$ divide the line segment joining the point $P(2, -2)$ and $Q(3, 7)$? Also find the value of y.

7 APPLICATIONS OF TRIGNOMETRY

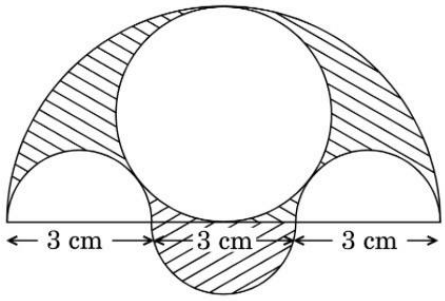
22. On a straight line passing through the foot of a tower, two points CD are at distances of 4 m and 16 m from the foot respectively. If the angles of elevation fromCD of the top tower are complementary, then find the height of the tower. KAVYA SREE, [04-02-2024 19:37]

23. From the top of a tower, 100 m high, a man observes two cars on the opposite sides of the tower and in same straight line with its base, with angles of depression 30° and 45°. Find the distance between the cars.

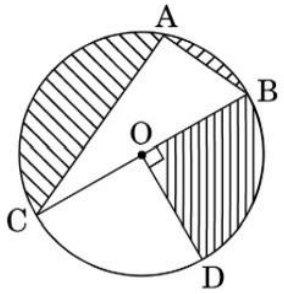
$$[Take \sqrt{3} = 1.732]$$

8 AREA OF CIRCLES

24. Three semicircles each of diameter 3 cm, a circle of diameter 4.5 cm and a semicircle of radius 4.5 are drawn in the given figure. Find the area of the shaded region.

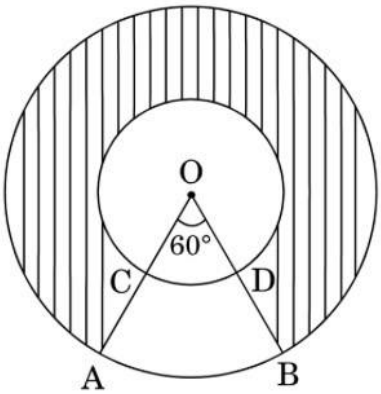


25. In the figure O is the centre of the circle with $AC = 24$cm, $AB = 7$ cm and $\angle$BOD = 90°. Find the area of the shaded region.



26. In the given figure, two concentric circles with centre O have radii 21cm and 42cm. If $\angle AOB$ 60°, find the area of the shaded region?

$[use\ \pi = \frac{22}{7}]$



27. The dimensions of a solid iron cuboid are 4.4 m×2.6 m ×1.0 m. It is melted and recast into a hollow cylindrical pipe of 30 cm inner radius and thinckness 5 cm. Find the length of the pipe.

9 SURFACE AREA AND VOLUME

28. Water in a canal 5.4 cm wide and 1.8 m deep, is flowing with a speed of $25km/hour$. How much area can it irrigate in 40 minutes, if 10 cm of standing water is required for irrigation ?

29. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius on its circular face. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

30. In a rain-water harvesting system, the rain-water form a roof of 22 m $\times$ 20 m drains into a cylindrical tank having diameter of base 2 m and height 3.5 m. If the tank is full, find the rainfall in cm. Write your views on water conservation.

10 TRIANGLES

31. Construct a triangle ABC with BC = 7 cm, $\angle B = 45\ ^\circ$,$\angle$A = 105° Then construct another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of the $\triangle ABC$.