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

TRIGNOMETRY

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

2. On a straight line passing through the foot of a tower, two points C and D are at distances of $4m$ and $16m$ from the foot respectively. If the angles of elevation from C and D of the top of the tower are complementary, then find the height of the tower.

CIRCLES

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

2. A circle touches all the four sides of a quadrilateral $ABCD$. Prove that $AB + CD = BC + DA$

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

PROGRESSIONS

1. What is the common difference of an A.P in which $(a_{21} - a_7 = 84)$?

2. For what value of (n), are the $(n)th$ terms of two A.Ps $(63, 65, 67, \dots)$ and $(3, 10, 17, \dots)$ equal?

3. How many terms of an A.P. 9, 17, 25, ... must be taken to give a sum of 636?

VOLUME & SURFACE AREAS

1. The dimensions of a solid iron cuboid are $44m \times 26m \times 10m$. It is melted and recast into a hollow cylindrical pipe of 30 cm inner radius and thickness 5 cm. Find the length of the pipe.

2. A toy is in the form of a cone of radius $35cm$ mounted on a hemisphere of same radius on its circular face. The total height of the toy is $155cm$. Find the total surface area of the toy.

PROBABILITY

1. 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?

2. 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.

COORDINATE GEOMETRY

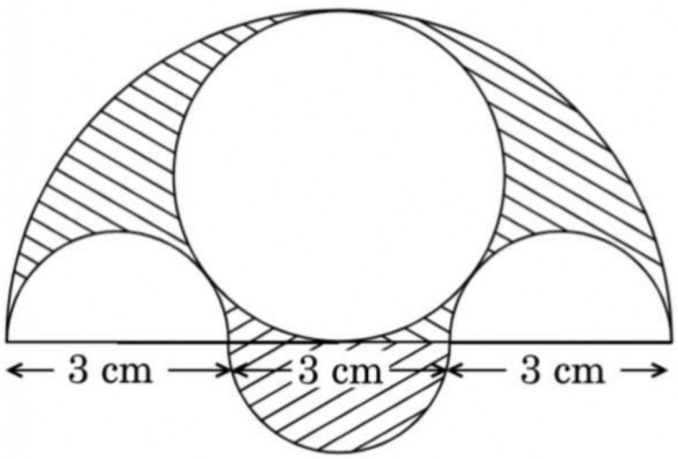
1. A line intersects the y-axis and x-axis at the points P and Q respectively. If $(2, -5)$ is the mid-point of PQ, then find the coordinates of P and Q.

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

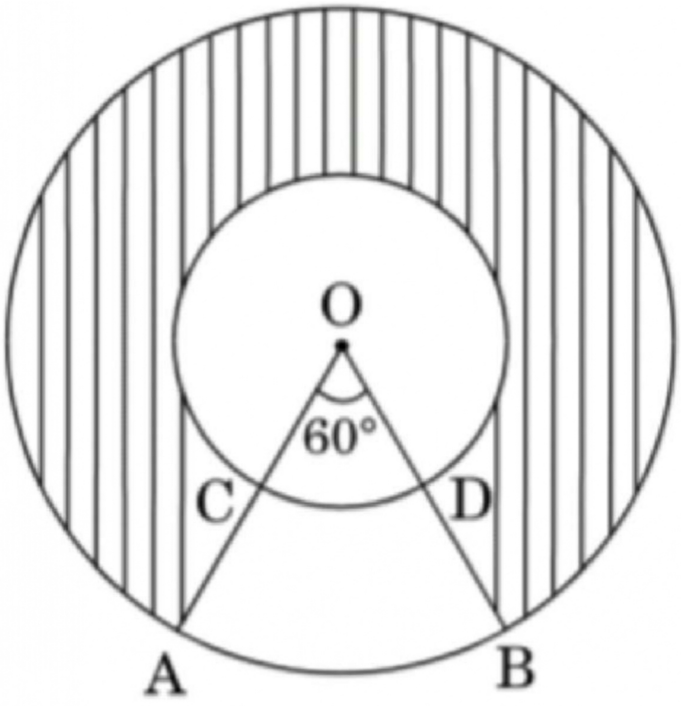
3. In what ratio does the point $[\frac{24}{11}, y]$ divide the line segment joining the points P(2,-2) and Q(3,7)? Also find the value of y.

4. Water in a canal, $54m$ wide and $18m$ deep,is flowing with a speed of $25km/hour$. How much area can it irrigate in $40minutes$, if $10cm$ of standing water is required for irrigation ?

5. Three semicircles each of diameter $3cm$, a circle of diameter $45cm$ and a semicircle of radius $45cm$ are drawn in the given figure. Find the area of the shaded region.



6. In the given figure, two concentric circles with centre O have radii $21cm$ 20 and $42cm$. If $\angle AOB = 60°$. find the area of the shaded region.


O
60°
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