

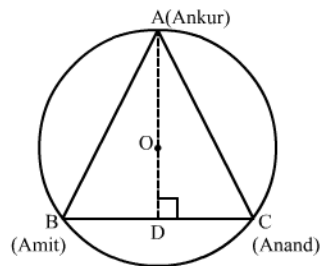


Circles Ex 16.3 Q2

Answer :

From the given data, we see that the given situation is equivalent to an equilateral triangle circumscribed by a circle.

Let the positions of the three boys Ankur, Amit and Anand be denoted by the points ' A ', ' B ' and ' C '. Let ' O ' be the centre of the circle, ' a ' is the sides of the equilateral triangle and ' R ' is its circumradius.



Now, in an equilateral triangle with side ' a ', the height, ' h ' of the equilateral triangle would be,

$$AB = BC = CA$$

Therefore, $\triangle ABC$ is an equilateral triangle.

$$OA = 40 \text{ m}$$

Medians of equilateral triangle pass through the circumcentre (O) of the equilateral triangle ABC .

We know that medians intersect each other in the ratio $2 : 1$. As AD is the median of equilateral triangle ABC , we can write

$$\frac{OA}{OD} = \frac{2}{1}$$

$$\Rightarrow \frac{40}{OD} = \frac{2}{1}$$

$$\Rightarrow OD = 20 \text{ m}$$

$$AD = AO + OD = (40 + 20) \text{ m} = 60 \text{ m}$$

In $\triangle ADC$,

$$AC^2 = AD^2 + DC^2$$

$$\Rightarrow AC^2 = (60)^2 + \frac{AC^2}{4} \quad \left[\because AC = BC, DC = \frac{1}{2} BC \Rightarrow DC = \frac{1}{2} AC \right]$$

$$\Rightarrow \frac{3AC^2}{4} = 3600$$

$$\Rightarrow AC^2 = 4800$$

$$\Rightarrow AC = 40\sqrt{3} \text{ m}$$

Hence the length of the string of each phone is $40\sqrt{3} \text{ m}$

***** END *****