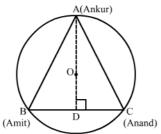


## Circles Ex 16.3 Q2

## 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  ${}^{\prime}A', {}^{\prime}B'$  and  ${}^{\prime}C'$ . Let  ${}^{\prime}O'$  be the centre of the circle,  ${}^{\prime}a'$  is the sides of the equilateral triangle and  ${}^{\prime}R'$  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

$$\begin{array}{l} \frac{OA}{OD} = \frac{2}{1} \\ \Rightarrow \frac{40}{OD} = \frac{2}{1} \\ \Rightarrow OD = 20 \text{ m} \\ AD = AO + OD = (40 + 20) \text{ m} = 60 \text{ m} \\ \text{In } \Delta ADC, \\ AC^2 = AD^2 + DC^2 \\ \Rightarrow AC^2 = (60)^2 + \frac{AC^2}{4} \qquad \left[\because AC = BC, DC = \frac{1}{2}BC \Rightarrow DC = \frac{1}{2}AC\right] \\ \Rightarrow \frac{3AC^2}{4} = 3600 \\ \Rightarrow AC^2 = 4800 \\ \Rightarrow AC = 40\sqrt{3} \text{ m} \end{array}$$

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

\*\*\*\*\*\*\* END \*\*\*\*\*\*\*