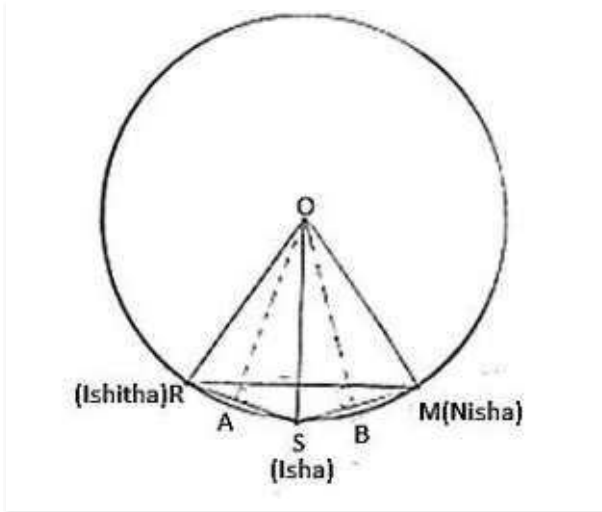


Q1) Three girls Ishita, Isha and Nisha are playing a game by standing on a circle of radius 20m drawn in a park. Ishita throws a ball to Isha, Isha to Nisha and Nisha to Ishita. If the distance between Ishita and Isha and between Isha and Nisha is 24m each, what is the distance between Ishita and Nisha.

Solution:

Let R, S and M be the position of Ishita, Isha and Nisha respectively.



$$AR = AS = \frac{24}{2} = 12\text{cm}$$

$$OR = OS = OM = 20\text{ cm} \quad [\text{Radii of circle}]$$

In $\triangle OAR$,

$$OA^2 + AR^2 = OR^2$$

$$OA^2 + 12^2 = 20^2$$

$$OA^2 = 400 - 144 = 256\text{m}^2$$

$$OA = 16\text{m}$$

We know that, in an isosceles triangle altitude divides the base.

So in $\triangle ORS$, $\angle RCS = 90^\circ$ and $RC = CM$

$$\text{Area of } \triangle ORS = \frac{1}{2} \times OA \times RS$$

$$\Rightarrow \frac{1}{2} \times RC \times OS = \frac{1}{2} \times 16 \times 24$$

$$\Rightarrow RC \times 20 = 16 \times 24$$

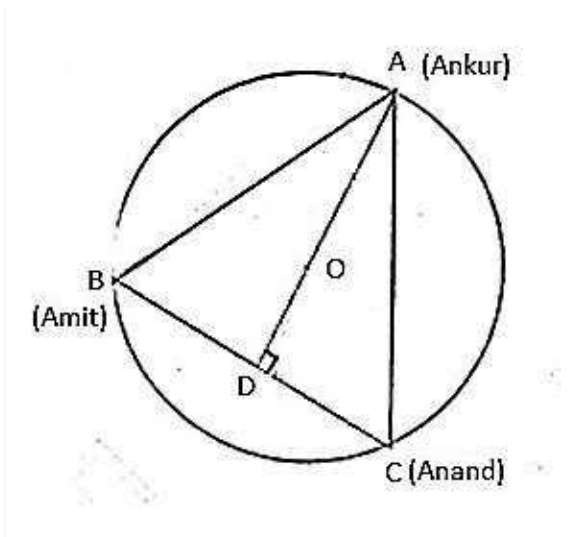
$$\Rightarrow RC = 19.2$$

$$\Rightarrow RM = 2(19.2) = 38.4\text{m}$$

So, the distance between Ishita and Nisha is 38.4m.

Q2) A circular park of radius 40 m is situated in a colony. Three boys Ankur, Amit and Anand are sitting at equal distance on its boundary each having a toy telephone in his hands to talk to each other. Find the length of the string of each phone.

Solution:



Given that $AB = BC = CA$

So, ABC is an equilateral triangle

OA (radius) = 40m

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

We also know that median intersect each other at the ratio 2 : 1.

As AD is the median of equilateral triangle ABC, we can write:

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

$$\Rightarrow \frac{4 \text{ OM}}{OD} = \frac{2}{1}$$

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

Therefore, $AD = OA + OD = (40 + 20) \text{ m}$

$= 60 \text{ m}$

In $\triangle ADC$

By using Pythagoras theorem

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

$$AC^2 = 60^2 + \left(\frac{AC}{2}\right)^2$$

$$AC^2 = 3600 + \frac{AC^2}{4}$$

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

$$\Rightarrow AC^2 = 4800$$

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

So, length of string of each phone will be $40\sqrt{3}\text{m}$..