Question 5:

Three girls Reshma, Salma and Mandip are playing a game by standing on a circle of radius 5 m drawn in a park. Reshma throws a ball to Salma, Salma to Mandip, Mandip to Reshma. If the distance between Reshma and Salma and between Salma and Mandip is 6 m each, what is the distance between Reshma and Mandip?

Answer:

Draw perpendiculars OA and OB on RS and SM respectively.
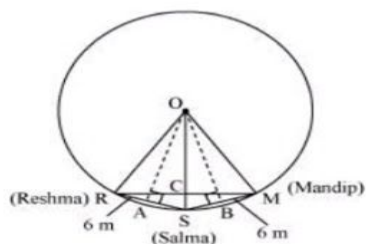
$$AR = AS = \frac{6}{2} = 3\,m$$

OR = OS = OM = 5 m. (Radii of the circle)

In ∆OAR,

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

$$OA^2 + (3\ m)^2 = (5\ m)^2$$

$$OA^2 = (25 - 9)\ m^2 = 16\ m^2$$

OA = 4 m

ORSM will be a kite (OR = OM and RS = SM). We know that the diagonals of a kite are perpendicular and the diagonal common to both the isosceles triangles is bisected by another diagonal.

∴ ∠RCS will be of 90° and RC = CM

Area of ∆ORS = $\dfrac{1}{2} \times OA \times RS$

$$\frac{1}{2} \times RC \times OS = \frac{1}{2} \times 4 \times 6$$
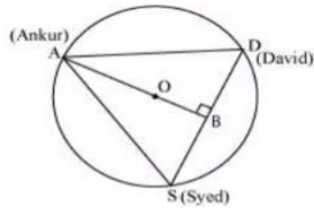$$RC \times 5 = 24$$
$$RC = 4.8$$
$$RM = 2RC = 2(4.8) = 9.6$$

Therefore, the distance between Reshma and Mandip is 9.6 m.

Question 6:

A circular park of radius 20 m is situated in a colony. Three boys Ankur, Syed and David are sitting at equal distance on its boundary each having a toy telephone in his hands to talk each other. Find the length of the string of each phone.

Answer:

It is given that AS = SD = DA

Therefore, ΔASD is an equilateral triangle.

OA (radius) = 20 m

Medians of equilateral triangle pass through the circum centre (O) of the equilateral triangle ASD. We also know that medians intersect each other in the ratio 2: 1. As AB is the median of equilateral triangle ASD, we can write

$$\Rightarrow \frac{OA}{OB} = \frac{2}{1}$$
$$\Rightarrow \frac{20 \text{ m}}{OB} = \frac{2}{1}$$
$$\Rightarrow OB = \left(\frac{20}{2}\right) m = 10 \text{ m}$$

∴ AB = OA + OB = (20 + 10) m = 30 m

In ΔABD,

$AD^2 = AB^2 + BD^2$

$AD^2 = (30)^2 + \left(\frac{AD}{2}\right)^2$

$AD^2 = 900 + \frac{1}{4} AD^2$

$\frac{3}{4} AD^2 = 900$

$AD^2 = 1200$

$AD = 20\sqrt{3}$

Hence, the length of the string will be 20√3 m.

Thanks...please wait for the next part