

# Plane Geometry

## Circle

Prove that the radii of the circles

$$x^2 + y^2 = 1$$

$$x^2 + y^2 - 2x - 6y - 6 = 0$$

$$x^2 + y^2 - 4x - 12y - 9 = 0 \quad \text{are in A.P.}$$

Proof  
=

Given eq. are

$$x^2 + y^2 = 1 \quad \rightarrow \textcircled{1}$$

$$x^2 + y^2 - 2x - 6y - 6 = 0 \quad \text{--- ②}$$

$$x^2 + y^2 - 4x - 12y - 9 = 0 \quad \text{--- ③}$$

$r_1 =$  Radius of ① = 1.

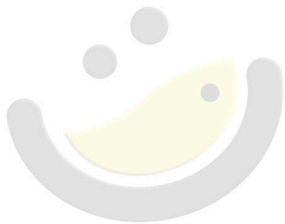
$$\begin{aligned} r_2 &= \text{Radius of ②} = \sqrt{g^2 + f^2 - c} \\ &= \sqrt{(-1)^2 + (-3)^2 - (-6)} \\ &= \sqrt{1 + 9 + 6} \\ &= \sqrt{16} = 4 \end{aligned}$$



$$r_2 = 4.$$

$$\begin{aligned} r_3 = \text{Radius of } \textcircled{3} &= \sqrt{g^2 + f^2 - c} \\ &= \sqrt{(-2)^2 + (-6)^2 - (-9)} \\ &= \sqrt{4 + 36 + 9} \\ &= \sqrt{49} = 7 \end{aligned}$$

$$r_3 = 7$$

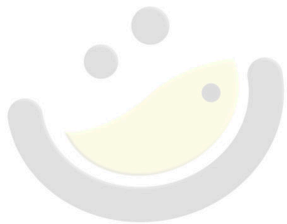


OMG { MATHS }

The poetry of logical ideas.

$$r_1, r_2, r_3 = 1, 4, 7$$

Hence radii are in A.P.



OMG { MATHS }

The poetry of logical ideas.