Assignment 2

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Outline

Question

ICSE 2018 Grade 12 Question viii:

Find the differential equation of the family of concentric circles
$x^2 + y^2 = a^2$

Solution

Given, family of concentric circle is $x^2 + y^2 = a^2$
Here it is given that the circle is concentric.So lets Differentiate w.r.t x

Differentiating w.r.t x we get,

$$2x + 2y\frac{dy}{dx} = 0 \tag{1}$$

$$2y\frac{dy}{dx} = -2x \tag{2}$$

this can also be written as,

$$\frac{dy}{dx} = \frac{-2x}{2y} \tag{3}$$

$$\frac{dy}{dx} = \frac{-x}{y} \tag{4}$$

this can also be written as,

$$x + y\frac{dy}{dx} = 0 \tag{5}$$