Assignment 2
AI1110: Probability and Random Variables
Indian Institute of Technology Hyderabad

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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 $x^2 + y^2 = a^2$.

Differentiate w.r.t x

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

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

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,

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