

5) The differential equation representing the family of curves $y = A \sin x + B \cos x$ is _____.

Solution: Differentiating the given function w.r.t. x successively, we get

$$\frac{dy}{dx} = A \cos x - B \sin x \quad \text{and} \quad \frac{d^2y}{dx^2} = -A \sin x - B \cos x$$

$\Rightarrow \frac{d^2y}{dx^2} + y = 0$ is the differential equation.