

$$vi) y = x^5 e^{3x}$$

$$u = x^5$$

$$v = e^{3x}$$

$$du = 5x^4$$

$$dv = 3e^{3x}$$

$$\frac{dy}{dx} = \underline{x^5 3e^{3x} + e^{3x} 5x^4}$$

$$vi) y = \frac{\sin 3x}{e^{2x}}$$

$$u = \sin 3x$$

$$v = e^{2x}$$

$$du = 3\cos 3x$$

$$dv = 2e^{2x}$$

$$\frac{dy}{dx} = \frac{e^{2x} 3\cos 3x - \sin 3x 2e^{2x}}{(e^{2x})^2}$$

$$vii) y = (x^3 - 2x + 5)^5$$

$$\frac{dy}{dx} = \underline{5(x^3 - 2x + 5)^4 (3x^2 - 2)}$$

$$viii) y = \sin^{-1}\left(\frac{x}{4}\right)$$

$$\frac{dy}{dx} = \frac{1}{\sqrt{1 - \frac{x^2}{16}}}$$

$$\frac{dy}{dx} = \frac{1}{\sqrt{4^2 - x^2}}$$

$$\frac{dy}{dx} = \frac{1}{\sqrt{16 - x^2}}$$