

55.  $\sec(x + y) = xy$

**Sol.** We have,  $\sec(x + y) = xy$

On differentiating both sides w.r.t  $x$ , we get

$$\sec(x + y) \cdot \tan(x + y) \cdot \frac{d}{dx}(x + y) = x \frac{dy}{dx} + y$$

$$\Rightarrow \sec(x + y) \cdot \tan(x + y) \cdot \left(1 + \frac{dy}{dx}\right) = x \frac{dy}{dx} + y$$

$$\Rightarrow \frac{dy}{dx} [\sec(x + y) \cdot \tan(x + y) - x] = y - \sec(x + y) \cdot \tan(x + y)$$

$$\therefore \frac{dy}{dx} = \frac{y - \sec(x + y) \cdot \tan(x + y)}{\sec(x + y) \cdot \tan(x + y) - x}$$