

Example 7 Find the equation of a curve whose tangent at any point on it, different from origin, has slope $y + \frac{y}{x}$.

Example 10 Solve $x^2 \frac{dy}{dx} - xy = 1 + \cos\left(\frac{y}{x}\right)$, $x \neq 0$ and $x = 1, y = \frac{\pi}{2}$

Example 18 A solution of the differential equation $\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} + y = 0$ is

(A) $y = 2$

(B) $y = 2x$

(C) $y = 2x - 4$

(D) $y = 2x^2 - 4$

Example 21 The solution of the differential equation $x\frac{dy}{dx} + 2y = x^2$ is

(A) $y = \frac{x^2 + c}{4x^2}$

(B) $y = \frac{x^2}{4} + c$

(C) $y = \frac{x^4 + c}{x^2}$

(D) $y = \frac{x^4 + c}{4x^2}$