

Variable Separable

2.1 $\cos^2 y dx + (1 + e^{-x}) \sin y dy = 0$ **Ans** $\ln(e^x + 1) = -\frac{1}{\cos y} + C; \cos y = 0$

2.2 $\frac{dy}{dx} = \frac{x^3 e^{x^2}}{y \ln y}$ **Ans** $y^2 \left(\ln y - \frac{1}{2} \right) = e^{x^2} (x^2 - 1) + C$

2.3 $x \cos^2 y dx + e^x \tan y dy = 0$ **Ans** $e^{-x} (x + 1) = \frac{1}{2 \cos^2 y} + C; \cos y = 0$

2.4 $x(y^2 + 1) dx + (2y + 1) e^{-x} dy = 0$

Ans $(x - 1) e^x + \ln(y^2 + 1) + \tan^{-1} y = C$

2.5 $xy^3 dx + e^{x^2} dy = 0$ **Ans** $e^{-x^2} + \frac{1}{y^2} = C; y = 0$

2.6 $x \cos^2 y dx + \tan y dy = 0$ **Ans** $x^2 + \tan^2 y = C$

2.7 $xy^3 dx + (y + 1) e^{-x} dy = 0$ **Ans** $e^x (x - 1) - \frac{1}{y} - \frac{1}{2y^2} = C; y = 0$