

Shepley L. Ross *Introduction to Ordinary Differential Equations*

Chapter 2. First-Order Equations for Which Exact Solutions
Are Obtainable

2.3. Linear Equations and Bernoulli Equations

2.3.1. Solve $\frac{dy}{dx} + \frac{3y}{x} = 6x^2$.

2.3.9. Solve $x \, dy + (xy + y - 1) \, dx = 0$.

2.3.15. Solve $\frac{dy}{dx} - \frac{y}{x} = \frac{-y^2}{x}$.

2.3.19. Solve the IVP $x \frac{dy}{dx} - 2y = 2x^4$, $y(2) = 8$.

2.3.21. Solve the IVP

$$e^x(y - 3(e^x + 1)^2) \, dx + (e^x + 1) \, dy = 0, \quad y(0) = 4.$$

2.3.23. Solve the IVP $\frac{dr}{d\theta} + r \tan \theta = \cos^2 \theta$, $r(\pi/4) = 1$.

2.3.25. Solve the IVP $\frac{dy}{dx} + \frac{y}{2x} = \frac{x}{y^3}$, $y(1) = 2$.