

Shepley L. Ross *Introduction to Ordinary Differential
Equations*

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

2.2. Separable Equations and Equations Reducible to This Form.

2.2.1. Solve $4xy \, dx + (x^2 + 1) \, dy = 0$.

2.2.5. Solve $\tan \theta \, dr + 2r \, d\theta = 0$.

2.2.11. Solve $(x \tan(y/x) + y) \, dx - x \, dy = 0$.

2.2.15. Solve the IVP $(y + 2) \, dx + y(x + 4) \, dy = 0$, $y(-3) = -1$.

2.2.19. Solve the IVP $(2x - 5y) \, dx + (4x - y) \, dy = 0$, $y(1) = 4$.

2.2.21(b). Prove that the homogeneous equation

$$(Ax^2 + Bxy + Cy^2) \, dx + (Dx^2 + Exy + Fy^2) \, dy = 0$$

is exact if and only if $B = 2D$ and $E = 2C$.