

1. Solve $(3x - y) dx - (x + y) dy = 0$.

2. Solve $(xy + y^2 + x^2) dx - x^2 dy = 0$.

3. Solve the initial value problem:

$$\frac{dy}{dx} - \frac{y}{x} = xe^x, \quad y(1) = e - 1.$$

4. Recognize the differential equation $y dx + (2x - 5y^3) dy = 0$ as one of the types that we studied already (be creative!) and solve it.