

Math 2013 Assignment 1
Due Wednesday Jan. 13 in class

1. Find all solutions to the following differential equations.

(a)

$$y' = 1 + x + y^2 + xy^2$$

(b)

$$y' = \frac{x^2}{1 + y^2}$$

(c)

$$xy' + 2y = \sin x$$

2. Find all solutions to the following initial value problems.

(a)

$$y' - y = 2xe^{2x}, \quad y(0) = 1$$

(b)

$$y' - 2y = e^{2x}, \quad y(0) = 2$$

(c)

$$y' = \frac{x(x^2 + 1)}{4y^3}, \quad y(0) = \frac{-1}{\sqrt{2}}$$

3. Find the solution of

$$\frac{dy}{dx} = \frac{1}{e^y - x}, \quad y(1) = 0$$

Hint: reverse the roles of x and y .