Assignment #11

Due on Friday, October 7, 2011

Read Section 5.1 on *Elementary Differential Equations,* pp. 186–191, in *Essential Calculus with Applications* by Richard A. Silverman.

Read Section 4.7, *Linear First Order Differential Equations,* in the class lecture notes at `http://pages.pomona.edu/~ajr04747/`, starting on page 54.

Do the following problems

1. Use the method of separation of variables to find all solutions to the differential equation
$$\frac{dy}{dt} = te^y.$$

2. Use separation of variables to find all solutions to the differential equation
$$\frac{dy}{dt} = 3ty - t.$$

3. Find a solution to the differential equation
$$\frac{dy}{dt} = y^2$$
   satisfying $y = 1$ when $t = 1$. Give the domain of the definition for the function.

4. Use separation of variable to find a solution to the differential equation
$$\frac{dy}{dt} = \sqrt{y}$$
   satisfying $y = 0$ when $t = 0$. Can you come up with another solution to the initial value problem?

5. Solve the initial value problem
$$y\frac{dy}{dt} = t, \qquad y(0) = 1.$$