Math 216 - Quiz 2

Name _____

February 12, 2014

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) Solve: $\dfrac{dy}{dx} + 4y = x^2\, e^{-4x},\ y(0) = 2$

2. (2 points) Solve: $\left(ye^{xy} - \dfrac{1}{y}\right)\, dx + \left(xe^{xy} + \dfrac{x}{y^2}\right)\, dy = 0$

3. (3 points) Read problem #35 on page 54. The initial value problem described in that mixing problem is:

$$\frac{dA}{dt} = 1 - \frac{1}{100}A,\ A(0) = 5.$$

Solve the IVP. Then find the amount of salt in the tank after 10 minutes.

4. (3 points) The solution of the following IVP must be written in terms of a definite integral (with bounds from 2 to x).

$$\frac{dy}{dx} = 1 - 2xy,\ y(2) = 1$$

(a) Solve the IVP.

(b) Use the numerical integration feature on your calculator or computer algebra system to compute $y(3)$.

(c) Use Euler's method with $h = 0.1$ to approximate $y(3)$.