Math 216 - Quiz 1

Name _____

January 18, 2012

Score _____

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

1. (6 points) Classify each differential equation as ordinary or partial, linear or nonlinear; give its order; and indicate the independent variable(s) and dependent variable.

   (a) $3x^2\dfrac{d^2y}{dx^2} + x\dfrac{dy}{dx} - 8y = 0$

   (b) $z^2\dfrac{\partial z}{\partial y} + 7x\dfrac{\partial z}{\partial x} = xyz$

   (c) $(3t+5)\dfrac{dw}{dt} = \sin(w)$

2. (4 points) Consider the following differential equation:

$$\frac{dy}{dx} = -\frac{2xy^2+1}{2x^2y}$$

   (a) Show that $x^2y^2 + x = C$ is an implicit solution for any constant C.

   (b) Find a constant C so that the solution satisfies the initial condition $y(1) = 1$.