

Math 207 Quiz #1
April 5, 2011

Name: _____

Show all work and answers on a separate sheet. Put a box around your final answer when appropriate.

1. (a) (1 pt.) Verify that $y = t^2 + C_1 e^{3t} + C_2 e^{-3t}$ is a general solution of $\frac{d^2 y}{dt^2} + 9t^2 = 9y + 2$.

(b) (2 pts.) Find a particular solution of $\frac{d^2 y}{dt^2} + 9t^2 = 9y - 2$ that satisfies the initial conditions $y(0) = 6, y'(0) = -6$.

2. (2 pts.) Does $x^2 y + 3y^4 = \sin(x)$ define an implicit solution to $y' = \frac{\cos(x) - 2xy}{x^2 + 12y^3}$? (Show work.)

3. (3 pts.) Provide a **rough** sketch of the direction field of $\frac{dy}{dx} = y^2$.
What happens to the solutions as $x \rightarrow \infty$?

4. (2 pts.) Use Euler's method with step size $h = 1$ to approximate $y(2)$ for the initial value problem $y' = 3x - y, y(0) = 5$.

Note: Euler's Method: $x_{i+1} = x_i + h, y_{i+1} = y_i + h \cdot f(x_i, y_i)$