

**Math 207 Quiz #1**  
**April 6, 2010**

Name: \_\_\_\_\_

Show all work on a separate sheet. Put a box around your final answer. No calculators are permitted.

1. (a) (1 pts.) Verify that  $y = t^2 + C_1 \cos t + C_2 \sin t$  is a general solution of  $\frac{d^2y}{dt^2} + y = t^2 + 2$ .  
  
(b) (2 pts.) Find a particular solution of  $\frac{d^2y}{dt^2} + y = t^2 + 2$  that satisfies the initial conditions  $y(0) = 0, y'(0) = 4$ .  

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2. (2 pts.) Does the relation  $\sin y + xy = x^2 + 1$  define an implicit solution to  $\frac{dy}{dx} = -\frac{y-2x}{\cos y+x}$ ?  

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

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