Math 325: Differential Equations Name:_____
Quiz 3 *February 9, 2001*

You may use your own calculator. You may not use anything else. You may not pass a calculator to another person.

Show all your work. Erase or cross out any work you do not want graded.

Consider the attached graph of two numerical solutions of a single first order differential equation $y'(x) = f(x, y)$ with initial condition $y(0) = -1/2$. The dotted curve was produced with Maple's **dsolve** command using the default accuracy settings. The solid curve was produced by increasing the accuracy by two decimal points (i.e., setting Digits := 12).

a) On which interval (approximately) is the first solution (the dotted curve) likely to be accurate? Explain.

b) Can you deduce anything about the solution as $x \to \infty$?

c) Which of the following differential equations could be the source of the graph? Justify your answer.

$y' = \sin^2 x$

$y' = y^3$

$y' = \sin x + y$

$y' = e^{y^3}$