

September 18, 2001

Name: _____

Quiz 3

Show all your work.

1. (10 pt) Without solving the problem, determine an interval in which the solution of the initial value problem is certain to exist:

$$(t^2 - 9)y' + (\sin t)y = \frac{1}{t + 1}, \quad y(-2) = 1$$

2. (10 pt) Consider the differential equation $y' = \sqrt{(y + 1)(y - 2)}$. For which of the following initial conditions, the IVP is certain to have a unique solution.
A. $y(0) = 0$, B. $y(0) = -2$, C. $y(0) = 2$, D. $y(-1) = 3$.

3. (10 pt) Find critical points of the differential equation $y' = y^2 - 3y + 2$. For each critical point, specify if it is asymptotically stable or unstable. Sketch a picture with solution curves.