

Quiz 3

MAC 2302/3305

Fall 2008

Full Name: _____

Score: _____

Show all of your work for full credit.

1. Solve the differential equation

$$\begin{aligned}y' + y^2 &= 0 \\ y(0) &= y_0\end{aligned}$$

Determine how the interval in which the solution exists depends on the initial value, y_0 .

2. For the following ODE: Find the critical points; sketch the phase-line; determine which critical points are stable, unstable and semi-stable; Give sketches of the solution for a representative set of initial conditions.

$$\frac{dy}{dt} = y - b\sqrt{y}, \quad b > 0, \quad y_0 \geq 0$$