

## MATH 331.1, Fall 2007 : Quiz #1

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

The quiz has 2 questions worth 5 points each.

1. Solve the initial value problem  $\frac{dy}{dt} = \frac{1+y^2}{y}$ ,  $y(0) = -2$ .

2. Consider the differential equation  $\frac{dy}{dt} = 3y^3 - 12y$

(a) Find the equilibrium points, draw the phase line, and identify the equilibrium points as source, sink, or node.

(b) Sketch the solutions with initial conditions  $y(0) = 2$ ,  $y(0) = -1$ ,  $y(0) = -3$ .