Mathematics 352
Quiz 5

March 13, 2013; 10 minutes   Name: _____

This quiz is *open-note*, but no books or calculators.

1. Consider the function $f(y) = y(1 - y^2)$. Sketch the graph of $f(y)$ versus y and classify the equilibrium points of the differential equation

$$y' = y(1 - y^2), \quad -\infty < y_0 < \infty$$

as stable, unstable, or semistable. Sketch the graphs of several solutions in the (t, y)-plane.

2. Solve the exact differential equation

$$(3x^2 - 2xy + 2) + (6y^2 - x^2 + 3)\frac{dy}{dx} = 0.$$

Your solution should involve an arbitrary constant.