Math 34 Differential Equations Exam #1
September 26, 2008 SHOW ALL WORK

[18] 1.) Solve the differential equation $2y' + \frac{y}{t} = t^2$

Answer 1.) ______________________________

[24] 2.) Solve the differential equation $y'' - 2y' + y = t$, $y(0) = 3$, $y'(0) = 4$.

Answer 2.) ______________________________

[18] 3.) Solve the differential equation $(t^2 + t - 2)y'y'' = 1$ **for y' in terms of t.**

Answer 3.) ______________________________

[14] 4.) Draw the direction field for $y' = y(y-4)$. Find the equilibrium solution(s) and determine if asymtptotically stable, semistable, or unstable.

[14] 5.) A ball with mass 0.3kg is thrown upward with an initial velocity of 98 m/sec from the roof of a building 20m high. If there is no air resistance, find the maximum height above the ground that the ball reaches.

Answer 5.) ______________________________

[14] 6.) Suppose $y = f(t)$ is a solution to $y' + p(t)y = q(t)$. Show that $y = 3f(t)$ is a solution to $y' + p(t)y = 3q(t)$.