MATH-266
Homework #3 (Section 2.3)
Due 06/24/14 **Name:** _____

The majority of the credit you receive will be based on the completeness and the clarity of your responses. Please use equal signs where appropriate and write solutions with a logical flow. Show your work, and avoid saying things that are untrue, ambiguous, or nonsensical.

1. Solve the following ODE's.

   (a) $\dfrac{dy}{dx} - y = e^{3x}$

   (b) $\dfrac{dy}{dx} = \dfrac{y}{x} + 2x + 1$

   (c) $\dfrac{dr}{d\theta} + r\tan\theta = \sec\theta$

   (d) $(x^2+1)\dfrac{dy}{dx} + xy = x$

2. Solve the following initial value problems.

   (a) $\dfrac{dy}{dx} - \dfrac{y}{x} = xe^x$,

   $y(1) = e - 1$

   (b) $t^3\dfrac{dx}{dt} + 3t^2x = t$,

   $x(2) = 0$

   (c) $\cos x\dfrac{dy}{dx} + y\sin x = 2x\cos^2 x$,

   $y\left(\dfrac{\pi}{4}\right) = \dfrac{-15\pi^2\sqrt{2}}{32}$

3. Do Exercise #36 in Section 2.3.