MATH 250 **Exam #2** **Fall 2006**	Do 4 of the 6 problems below. Show all work on the blank paper provided.	**Name:**

Prob. Num.	Point Value	Points Given
1	**20**	
2	**20**	
3	**20**	
4	**20**	
5	**20**	
6	**20**	
Total	**80**	
Curve		
Grade		

1) Solve the initial value problem: $\dfrac{dy}{dx} + \dfrac{3y}{x} + 2 = 3x, \quad y(1) = 1$.

2) Solve the exact equation: $\left(ye^{xy} - y^{-1}\right)dx + \left(xe^{xy} + xy^{-2}\right)dy = 0$.

3) Solve the equation using a special integrating factor: $(2xy)\,dx + \left(y^2 - 3x^2\right)dy = 0$.

4) Solve the homogeneous equation: $\dfrac{dy}{d\theta} = \dfrac{\theta \sec\left(y/\theta\right) + y}{\theta}$

5) Solve the Bernoulli equation: $\dfrac{dy}{dx} + y = e^x y^{-2}$

6) Solve the initial value problem $(\tan y - 2)\,dx + \left(x\sec^2 y + 1/y\right)dy = 0, \quad y(0) = 1$.