

MATH 250  
FALL 2007  
EXAM 2

NAME:

1. 10 pts. Solve  $\left(ye^{xy} - \frac{1}{y}\right) + \left(xe^{xy} + \frac{x}{y^2}\right)y' = 0$ .
2. 10 pts. Solve  $2xy + (y^2 - 3x^2)y' = 0$ .
3. 10 pts. Solve the homogeneous equation  $(x^2 + y^2) + 2xyy' = 0$ .
4. 10 pts. Solve the Bernoulli equation  $y' + y^3x + y = 0$ .
5. 15 pts. A brine solution flows at a constant rate of 5 L/min into a large tank that initially held 90 L of pure water. The solution inside the tank is kept well stirred and flows out of the tank at a rate of 2 L/min. If the concentration of salt in the brine entering the tank is 0.25 kg/L, determine the mass of salt in the tank after  $t$  minutes.