Math 196 - Quiz 2, September 11, 2008 Name:_____

Problem 1. Find a solution (or give a reason why it does not exist) to the differential equation $(x^2+1)^2(\frac{dy}{dx}-2y) = -2xe^{2x}$ given the initial condition $y(0)=0$.

Problem 2. A large tank is half full with a mixture of salt dissolved in water. Pure water is pumped into the tank at the rate of 2 gallons per minute, and water is let out of the tank at the rate of 1 gallon per minute, thus overall the tank is filling up. Assuming the mixture in the tank is kept uniform by stirring, what percentage of the original salt will still be in the tank when it is full?

Hint: The answer does not depend on the size of the tank, nor the amount of salt initially in the tank, thus if you prefer you may take any values you want for these.