Homework 3 (MATH 2310-04)   **Name (Print):**

Due date: Thursday, Feb. 20, 2014

1. Determine whether the following differential equation is exact. If it is exact, find the solution.

$$\frac{y}{x} + 6x + \left(\ln(x) - 2\right)\frac{dy}{dx} = 0. \qquad\qquad x > 0$$

2. Determine whether the following differential equation is exact. If it is exact, find the solution.

$$ye^{xy}\cos(2x) - 2e^{xy}\sin(2x) + 2x + \left(xe^{xy}\cos(2x) - 3\right)\frac{dy}{dx} = 0.$$

3. Determine whether the following differential equation is exact. If it is exact, find the solution for the following initial value problem.

$$2x - y + \left(2y - x\right)\frac{dy}{dx} = 0. \qquad\qquad y(1) = 3$$