Homework 2

1. For the following differential equation determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$(2x + 3) + (2y - 2)y' = 0.$$

2. For the following differential equation determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$y' = e^{2x} + y + 1.$$

3. For the following differential equation determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$(3x^2 - 2xy + 2) + (6y^2 - x^2 + 3)y' = 0.$$

4. For the following differential equation determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$(y/x + 6x) + (\ln x - 2)y' = 0.$$

5. For the following differential equation determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$y + (2xy - e^{-2y})y' = 0$$

6. For the following initial value problem determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$(2x - y) + (2y - x)y' = 0, \quad y(1) = 3.$$

7. For the following differential equation determine if it is exact or not. If it is not exact, see if you can find an integrating factor. In either case solve it.

$$(x + 2)\sin y + (x\cos y)y' = 0.$$