

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, then 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, then 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, then 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, then 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, then 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, then 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, then solve it.

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