

Due Thursday, Feb. 13 at the beginning of class.

1. Find an integrating factor and then solve the equation.

(a) $(3x^2 + y)dx + (x^2y - x)dy = 0$

(b) $(2y^2 + 2y + 4x^2)dx + (2xy + x)dy = 0$

2. Find an integrating factor of the form $x^n y^m$ and then solve the equation

$$(2y^2 - 6xy)dx + (3xy - 4x^2)dy = 0$$

3. Find a general solution to the given differential equation.

(a) $y'' + 8y' + 16y = 0$

(b) $y'' - y' - 2y = 0$

(c) $y'' - 5y' + 6y = 0$

(d) $4y'' - 4y' + y = 0$

4. Solve the given initial value problem.

(a) $y'' + 2y' - 8y = 0, y(0) = 3, y'(0) = -12$

(b) $y'' + 2y' + y = 0, y(0) = 2, y'(0) = 1$