

Spring 2024 – Math 3331 – Homework 3

1. Exact equations - Solve the following.

$$(i) \quad \frac{dy}{dx} = -\frac{y(xy + 2x + y)}{x(xy + x + 2y)}$$

$$(ii) \quad \frac{dy}{dx} = \frac{3y + 2xe^y}{2y - 3x - x^2e^y}$$

$$(iii) \quad \frac{dy}{dx} = \frac{y + 3x^2}{8y - x}$$

$$(iv) \quad \frac{dy}{dx} = \frac{2x - y}{x + 2y}$$

Due: Monday Feb. 12, 2024

Solns

$$(i) \quad \frac{1}{2}x^2y^2 + x^2y + xy^2 = c$$

$$(ii) \quad 3xy + x^2e^y - y^2 = c$$

$$(iii) \quad x^3 + xy - 4y^2 = c$$

$$(iv) \quad x^2 - xy - y^2 = c$$