

Recommended

Math 246

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Review problems we did in class. Also review the following. Section 1.5 : Problem 6.

Section 1.6: Problems 4,5,10,12,15.

In the following problems determine the type of the equation and find the general solution or solve the IVP.

1.

$$y' = \frac{x^3 - 2y}{x} \quad x > 0$$

$$\text{Answer : } y = \frac{c}{x^2} + \frac{x^3}{5}$$

2.

$$y' = \frac{2x + y}{3 + 3y^2 - x} \quad y(0) = 0$$

$$\text{Answer : } x^2 + xy - 3y - y^3 = 0$$

3.

$$(x + e^y)dy - dx = 0 \quad y(0) = 1$$

Hint. Consider x as a function of y . Answer: $x = (y - 1)e^y$

4.

$$y' = -\frac{2xy + y^2 + 1}{x^2 + 2xy}$$

$$\text{Answer: } x^2y + xy^2 + x = c$$

5.

$$y' = \frac{x^2 - 1}{y^2 + 1} \quad y(-1) = 1$$

$$\text{Answer: } y^3 + 3y - x^3 + 3x = 2$$

6.

$$\frac{dy}{dx} - \frac{1}{1 + e^x} = -y$$

$$\text{Answer : } y = e^{-x}(c + \ln(1 + e^x))$$

7.

$$(e^{-x} \cos y - e^{2y} \cos x)dx + (e^{-x} \sin y - 2e^{2y} \sin x)dy = 0$$

$$\text{Answer : } e^{-x} \cos y + e^{2y} \sin x = c$$