

HOMEWORK #2 (Chapter 2 Exercises---Separable Variables, Linear Equations)

Due on Oct. 12

1) Solve $y' = \frac{3x - y - 9}{x + y + 1}$

2) Solve $y' = \frac{x - 2y}{3x - 6y + 4}$

Consider 3)~4), find the general solution of the given differential equation. Give the largest interval over which the general solution is defined. Determine whether there are any **transient terms** (y_c , see page 51 of the textbook) in the general solution.

3) $x \frac{dy}{dx} - y = x^2 \sin(x)$ (page 57, Problem 9.)

4) $y dx - 4(x + y^6) dy = 0$ (page 57, Problem 15.)

5) Solve the given Bernoulli equation by using an appropriate substitution.

$$t^2 \frac{dy}{dt} + y^2 = ty \quad (\text{ page 67, Problem 19.})$$

6) Find a one-parameter family of solutions for the differential equation

$$\frac{dy}{dx} = -\frac{4}{x^2} - \frac{1}{x}y + y^2 \quad \text{where } y_1 = 2/x \text{ is a known solution of the equation}$$

(page 68, Problem 33(b).)