

ENGR 326
ODE Lab Assignment 1

Determine if the following are solutions to the ODE.

1. $y = \sin(x) + x^2$ $\frac{d^2y}{dx^2} + y = x^2 + y$

2. $x = 2e^{3t} - e^{2t}$ $\frac{d^2x}{dt^2} - x \frac{dx}{dt} + 3x = -2e^{2t}$

3. $x = \cos(t) - 2 \sin(t)$ $x'' + x = 0$

Do the following IVPs have unique solutions?

4. $\frac{dy}{dx} + \cos(y) = \sin(x)$ $y(\pi) = 0$

5. $y \frac{dy}{dx} - 4x = 0$ $y(0) = 0$

Solve the following ODEs.

6. $\frac{dy}{dx} = \frac{x^2-1}{y^2}$

7. $\frac{dy}{dx} = 3x^2(1 + y^2)$

8. $\frac{dy}{dx} = \frac{3x^2+4x+2}{2y+1}$ $y(0) = -1$