Quiz 1

MATH 2280, ORDINARY DIFFERENTIAL EQUATIONS, FALL 2023

NAME: A#:

Problem 1. Section 1.3d (10 points) For each differential equation given three choices for a possible solution $y = y(x)$ are given. Determine whether each choice is or is not a solution to the given differential equation. (In each case, assume the interval of interest is the entire real line $(-\infty, \infty)$

$$\frac{d^2y}{dx^2} = -9\ y$$

i.) $y(x) = e^{3x}$ **ii**.) $y(x) = x^3$ **iii**.) $y(x) = sin(3x)$

Solution:

Problem 2. Section 1.4d (10 points) For each initial value problem given below, three choices for a possible solution, $y = y(x)$ are given. Determine whether each choice is or is not a solution to the given initial-value problem.

$$x^2 \frac{d^2y}{dx^2} - 4\ x \frac{dy}{dx} + 6\ y = 36\ x^6$$

with $y(1) = 1$ and $y'(1) = 12$.

i.) $y(x) = 2e^{3x} - e^{-3x}$ **ii**.) $y(x) = e^{3x}$ **iii**.) $y(x) = e^{3x} + 1$

Solution: