Math 2C03 2021 Assignment #5 (18512634)

Question 1 2 3 4 5

Description
undetermined coeff

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1. Question Details ZillDiffEQ9 4.4.018. [4568027]

Solve the given differential equation by undetermined coefficients.

$$y'' - 2y' + 2y = e^{2x}(\cos(x) - 8\sin(x))$$

$y(x) =$

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2. Question Details ZillDiffEQ9 4.4.028. [4568032]

Solve the given initial-value problem.

$$2y'' + 3y' - 2y = 10x^2 - 8x - 13,\ \ y(0) = 0,\ y'(0) = 0$$

$y(x) =$

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3. Question Details ZillDiffEQ9 4.4.034. [3894093]

Solve the given initial-value problem. (Assume $\omega \neq \gamma$.)

$$\frac{d^2x}{dt^2} + \omega^2 x = F_0 \cos(\gamma t),\ \ x(0) = 0,\ \ x'(0) = 0$$

$x(t) =$

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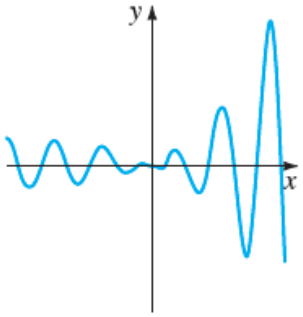
4. Question Details ZillDiffEQ9 4.4.045. [3894098]

Without solving, match a solution curve of $y'' + y = f(x)$ shown in the figure with one of the following functions.



- $f(x) = 1$
- $f(x) = e^{-x}$
- $f(x) = e^{x}$
- $f(x) = \sin(2x)$
- $f(x) = e^{x} \sin(x)$
- $f(x) = \sin(x)$

Briefly discuss your reasoning.

We see that the solution is the sum of a sinusoidal term and a term that

- is sinusoidal with a different period.
- is constant and simply translates the sinusoidal part vertically.
- goes to ∞ as $x \to \infty$ and 0 as $x \to -\infty$.
- goes to 0 as $x \to \infty$ and ∞ as $x \to -\infty$.
- oscillates with an amplitude that goes to ∞ as $x \to \infty$ and 0 as $x \to -\infty$.

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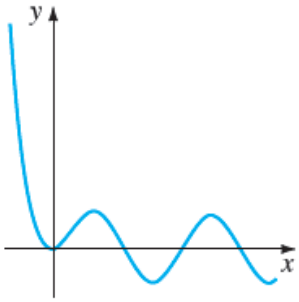
5. Question Details ZillDiffEQ9 4.4.046. [3894212]

Without solving, match a solution curve of $y'' + y = f(x)$ shown in the figure with one of the following functions.



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- $f(x) = e^{-x}$
- $f(x) = e^{x}$
- $f(x) = \sin(2x)$
- $f(x) = e^{x}\sin(x)$
- $f(x) = \sin(x)$

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Assignment Details

Name (AID): **Math 2C03 2021 Assignment #5 (18512634)**
Submissions Allowed: **7**
Category: **Homework**
Code:
Locked: **Yes**
Author: **Lia Bronsard** (bronsard@mcmaster.ca)
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