Math 2C03 2021 Assignment #4 (18512423)

Question 1 2 3 4 5 6 7 8

Description
constant coeff

1. Question Details ZillDiffEQ9 4.3.014. [4568061]

Find the general solution of the given second-order differential equation.

$$2y'' - 5y' + 6y = 0$$

$y(x) =$

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2. Question Details ZillDiffEQ9 4.3.024.EP. [4903581]

Consider the following higher-order differential equation.

$$y^{(4)} - 2y'' + y = 0$$

Find all the roots of the auxiliary equation. (Enter your answer as a comma-separated list.)

Find the general solution of the given equation.

$y(x) =$

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3. Question Details ZillDiffEQ9 4.3.026. [4568062]

Find the general solution of the given higher-order differential equation.

$$\frac{d^4y}{dx^4} - 23\frac{d^2y}{dx^2} - 50y = 0$$

$y(x) =$

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4. Question Details ZillDiffEQ9 4.3.030. [4568014]

Solve the given initial-value problem.

$$\frac{d^2y}{d\theta^2} + y = 0, \quad y(\pi/3) = 0, \quad y'(\pi/3) = 4$$

$y(\theta) =$

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5. Question Details ZillDiffEQ9 4.3.035.MI.SA. [4605517]

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

Solve the given initial-value problem.

$$y''' + 8y'' + 16y' = 0, \quad y(0) = 0, y'(0) = 1, y''(0) = -7$$

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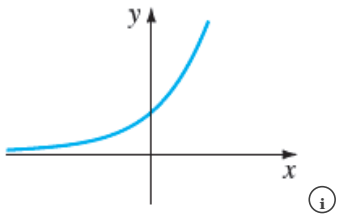
6. Question Details ZillDiffEQ9 4.3.043. [4568153]

Match the solution curve with one of the differential equations.



- $y'' + y = 0$
- $y'' + 4y = 0$
- $y'' - 4y' - 5y = 0$
- $y'' + 2y' + y = 0$
- $y'' - 7y' + 12y = 0$
- $y'' + 2y' + 2y = 0$

Explain your reasoning. (Assume that k, k_1, and k_2 are all positive.)

- The auxiliary equation should have one positive and one negative root, so that the solution has the form $c_1e^{k_1x} + c_2e^{-k_2x}$.
- The auxiliary equation should have a repeated negative root, so that the solution has the form $c_1e^{-kx} + c_2xe^{-kx}$.
- The auxiliary equation should have two positive roots, so that the solution has the form $c_1e^{k_1x} + c_2e^{k_2x}$.
- The auxiliary equation should have a pair of complex roots $\alpha \pm \beta i$ where $\alpha < 0$, so that the solution has the form $e^{\alpha x}(c_1 \cos(\beta x) + c_2 \sin(\beta x))$.
- The differential equation should have the form $y'' + k^2y = 0$ where $k = 1$, so that the period of the solution is 2π.
- The differential equation should have the form $y'' + k^2y = 0$ where $k = 2$, so that the period of the solution is π.

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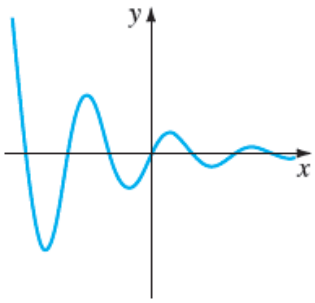
7. Question Details ZillDiffEQ9 4.3.045. [4568115]

Match the solution curve with one of the differential equations.



- $y'' + y = 0$
- $y'' + 2y' + y = 0$
- $y'' - 3y' - 4y = 0$
- $y'' + 2y' + 2y = 0$
- $y'' - 5y' + 4y = 0$
- $y'' + 9y = 0$

Explain your reasoning. (Assume that k, k_1, and k_2 are all positive.)

- The auxiliary equation should have one positive and one negative root, so that the solution has the form $c_1e^{k_1x} + c_2e^{-k_2x}$.
- The auxiliary equation should have a repeated negative root, so that the solution has the form $c_1e^{-kx} + c_2xe^{-kx}$.
- The auxiliary equation should have a pair of complex roots $\alpha \pm \beta i$ where $\alpha < 0$, so that the solution has the form $e^{\alpha x}(c_1 \cos(\beta x) + c_2 \sin(\beta x))$.
- The differential equation should have the form $y'' + k^2y = 0$ where $k = 2$ so that the period of the solution is π.
- The differential equation should have the form $y'' + k^2y = 0$ where $k = 1$ so that the period of the solution is 2π.
- The auxiliary equation should have two positive roots, so that the solution has the form $c_1e^{k_1x} + c_2e^{k_2x}$.

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8. Question Details ZillDiffEQ9 4.3.056. [3894091]

Find a homogeneous linear differential equation with constant coefficients whose general solution is given.

$y = c_1 + c_2e^{2x}\cos(4x) + c_3e^{2x}\sin(4x)$

- $y'' + 4y' + 20y = 0$
- $y''' - 4y'' + 20y' = 0$
- $y'' + 20y' + 16y = 0$
- $y''' - 4y'' - 20y' + 16y = 0$
- $y''' - 4y'' + 20y' + 16y = 0$

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Assignment Details

Name (AID): **Math 2C03 2021 Assignment #4 (18512423)**
Submissions Allowed: **7**
Category: **Homework**
Code:
Locked: **Yes**
Author: **Lia Bronsard (** bronsard@mcmaster.ca **)**
Last Saved: **Feb 11, 2021 10:59 PM EST**
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