2C03 2021 Practice problem set #5 (18540163)

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Description

Undetermined coefficients, variation of parameters

1.　　　Question Details　　　　　　　　　　　　　　　　　　　　　ZillDiffEQ9 4.4.007.EP. [4603933]

Consider the following differential equation to be solved by the method of undetermined coefficients.

$$y'' + 5y = -180x^2e^{5x}$$

Find the complementary function for the differential equation.

$y_c(x) = $ [   ]

Find the particular solution for the differential equation.

$y_p(x) = $ [   ]

Find the general solution for the differential equation.

$y(x) = $ [   ]

Need Help?　[Read It]　[Watch It]

2.　　　Question Details　　　　　　　　　　　　　　　　　　　　　ZillDiffEQ9 4.4.009. [4568090]

Solve the given differential equation by undetermined coefficients.

$$y'' - y' = -4$$

$y(x) = $ [   ]

Need Help?　[Read It]　[Watch It]

3.　　　Question Details　　　　　　　　　　　　　　　　　　　　　ZillDiffEQ9 4.4.011. [4568295]

Solve the given differential equation by undetermined coefficients.

$$y'' - y' + \frac{1}{4}y = 8 + e^{x/2}$$

$y(x) = $ [   ]

Need Help?　[Read It]　[Watch It]

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4. Question Details   ZillDiffEQ9 4.4.017. [4568211]

Solve the given differential equation by undetermined coefficients.

$$y'' - 2y' + 50y = e^x \cos(7x)$$

$y(x) = $ [   ]

Need Help? [Read It] [Watch It]

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5. Question Details   ZillDiffEQ9 4.4.029. [4568124]

Solve the given initial-value problem.
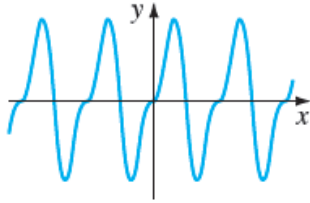
$$5y'' + y' = -2x, \quad y(0) = 0, \, y'(0) = -15$$

$y(x) = $ [   ]

Need Help? [Read It] [Watch It]

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6. Question Details   ZillDiffEQ9 4.4.047. [3894104]

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 $x \to -\infty$.

Need Help?   [Read It]

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7. Question Details   ZillDiffEQ9 4.6.001.EP. [4603964]

Consider the following differential equation to be solved by variation of parameters.

$$y'' + y = \csc(x)$$

Find the complementary function of the differential equation.

$y_c(x) = $ [   ]

Find the general solution of the differential equation.

$y(x) = $ [   ]

Need Help?   [Read It]   [Watch It]

8.   Question Details   ZillDiffEQ9 4.6.005. [4568127]

Solve the differential equation by variation of parameters.

$$y'' + y = \sin^2(x)$$

$y(x) =$ [   ]

Need Help? [Read It] [Watch It]

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9.   Question Details   ZillDiffEQ9 4.6.007. [3894097]

Solve the differential equation by variation of parameters.

$$y'' - y = \cosh(x)$$

$y(x) =$ [   ]

Need Help? [Read It]

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10.   Question Details   ZillDiffEQ9 4.6.011.MI.SA. [4605479]

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 differential equation by variation of parameters.

$$y'' + 3y' + 2y = \frac{1}{4 + e^x}$$

Need Help? [Read It] [Watch It]

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11.   Question Details   ZillDiffEQ9 4.6.013. [4568110]

Solve the differential equation by variation of parameters.

$$y'' + 3y' + 2y = \cos(e^x)$$

$y(x) =$ [   ]

Need Help? [Read It] [Watch It]

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12.   Question Details   ZillDiffEQ9 4.6.015. [3894198]

Solve the differential equation by variation of parameters.

$$y'' + 2y' + y = e^{-t} \ln(t)$$

$y(t) =$ [   ]

Need Help? [Read It]

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13.   Question Details   ZillDiffEQ9 4.6.017. [4654974]

Solve the differential equation by variation of parameters.

$$5y'' - 10y' + 10y = e^x \sec x$$

$y(x) =$ [   ]

Need Help? [Read It]

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14.   Question Details   ZillDiffEQ9 4.6.027. [3894192]

The indicated functions are known linearly independent solutions of the associated homogeneous differential equation on $(0, \infty)$. Find the general solution of the given nonhomogeneous equation.

$$x^2 y'' + xy' + \left(x^2 - \frac{1}{4} \right) y = x^{3/2};$$
$$y_1 = x^{-1/2} \cos(x), \, y_2 = x^{-1/2} \sin(x)$$

$y(x) =$ [   ]

Need Help? [Read It]

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15.   Question Details   ZillDiffEQ9 4.6.029. [4568274]

Solve the given third-order differential equation by variation of parameters.

$$y''' + y' = \cot(x)$$

$y(x) =$ [   ]

Need Help? [Read It]

Assignment Details

Name (AID): **2C03 2021 Practice problem set #5 (18540163)**   **Feedback Settings**
Submissions Allowed: **20**   Before due date
Category: **Homework**   Question Score
Code: Assignment Score
Locked: **No**   Publish Essay Scores
Author: **Lia Bronsard (bronsard@mcmaster.ca)**   Question Part Score
Last Saved: **Feb 22, 2021 11:40 AM EST**   Mark
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Randomization: **Person**
Which graded: **Last**

Response
Save Work
After due date
Question Score
Assignment Score
Publish Essay Scores
Question Part Score
Solution
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