Matthew Mendoza **Math-45-Krauel-F20**

Assignment Math45-Homework-WEEK-10 due 11/07/2020 at 11:59pm PST

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1. (1 point)

(1) Find a particular solution to the nonhomogeneous differential equation $y'' + 4y' + 4y = 8x^2 + 4x + 8$. (Note: it might be better to first do part (b) before part (a).)

$y_p =$ _____ help (formulas)

(2) Find the most general solution to the associated homogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants, and enter them as c1 and c2.

$y_c =$ _____ help (formulas)

(3) Find the most general solution to the original nonhomogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants.

$y =$ _____ help (formulas)

Correct Answers:

- `2*x^2+-3*x+4`
- `c1*e^(-2*x)+c2*x*e^(-2*x)`
- `2*x^2+-3*x+4+c1*e^(-2*x)+c2*x*e^(-2*x)`

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2. (1 point)

(1) Find a particular solution to the nonhomogeneous differential equation $y'' - y' = -5$. (Note: it might be better to first do part (b) before part (a).)

$y_p =$ _____ help (formulas)

(2) Find the most general solution to the associated homogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants, and enter them as c1 and c2.

$y_c =$ _____ help (formulas)

(3) Find the most general solution to the original nonhomogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants.

$y =$ _____ help (formulas)

Correct Answers:

- `5*x`
- `c1+c2*e^x`
- `5*x+c1+c2*e^x`

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3. (1 point) Solve the following differential equation by variation of parameters. Fully evaluate all integrals.

$$y'' + 9y = \sec(3x).$$

(1) Find the most general solution to the associated homogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants, and enter them as c1 and c2.

$y_c =$ _____ help (formulas)

(2) Find a particular solution to the nonhomogeneous differential equation $y'' + 9y = \sec(3x)$.

$y_p =$ _____ help (formulas)

(3) Find the most general solution to the original nonhomogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants.

$y =$

_____ help (formulas)

Correct Answers:

- `c1*cos(3*x)+c2*sin(3*x)`
- `a*cos(3*x)+b*sin(3*x)+1/3*x*sin(3*x)+1/9*cos(3*x)*ln(|cos(`
- `c1*cos(3*x)+c2*sin(3*x)+1/3*x*sin(3*x)+1/9*cos(3*x)*ln(|co`

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4. (1 point) Solve the following differential equation by variation of parameters. Fully evaluate all integrals.

$$y'' - 4y = xe^{2x}.$$

(1) Find the most general solution to the associated homogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants, and enter them as c1 and c2.

$y_c =$ _____ help (formulas)

(2) Find a particular solution to the nonhomogeneous differential equation $y'' - 4y = xe^{2x}$.

$y_p =$ _____ help (formulas)

(3) Find the most general solution to the original nonhomogeneous differential equation. Use c_1 and c_2 in your answer to denote arbitrary constants.

$y =$

_____ help (formulas)

Correct Answers:

- `c1*e^(2*x)+c2*e^(-2*x)`
- `a*e^(2*x)+b*e^(-2*x)+1/8*x^2*e^(2*x)-1/16*x*e^(2*x)`
- `c1*e^(2*x)+c2*e^(-2*x)+1/8*x^2*e^(2*x)-1/16*x*e^(2*x)`