Unit 4 - Week 3

Assessment-3

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

1) Using the method of variation of parameters, the general solution of the equation \( y'' + 4y = 4\tan 2x \) is given by

\[
y(x) = c_1 \sin 2x + c_2 \cos 2x - \frac{1}{2} \ln(\sec 2x + \tan 2x) \cos 2x
\]

2) Using the method of variation of parameters, the general solution of the equation \( y'' - 3y' + 2y = e^{\sin x} \) is given by

\[
y(x) = c_1 e^x + c_2 e^{2x} - (e^x + e^{2x}) \ln(e^x + 1)
\]

3) Applying the method of change of dependent variable, the general solution of the differential equation \( (y'' + y) \cot x + 2(y' + y \tan x) = 0 \)

\[
y(x) = c_1 \cos x + c_2 \sin x + \frac{1}{2} \sin x
\]

4) Applying the method of change of dependent variable, the general solution of the differential equation \( y'' - 4xy' + (4x^2 - 3)y = e^{x^2} \) is

\[
y(x) = e^{x^2} (c_1 e^{x^2} + c_2 e^{-x^2} - 1)
\]

5) Applying the method of change of independent variable, the general solution of the differential equation

\[
y(x) = e^{x^2} (c_1 e^{x^2} + c_2 e^{-x^2} - 1)
\]
y(x) = c_1 e^{x^2} + c_2 e^{-x}

y(x) = (c_1 + c_2) x^2

No, the answer is incorrect.
Score: 0

Scoring Answers:
y(x) = c_1 e^{-x} + c_2 e^{2x}

6) Using the method of change of independent variable, the general solution of the differential equation

y'' + (3 \sin x - \cot x) y' + 2 \sin x = e^{-x} \sin x

can be written as

y(x) = c_1 e^{-x} + c_2 e^{2x} + \frac{1}{4} e^{-x} \sin x

y(x) = c_1 e^{2x} - 2e^{-x} + \frac{1}{4} e^{-x} \sin x

y(x) = c_1 e^{2x} - 2e^{-x} + \frac{1}{4} e^{-x} \sin x

No, the answer is incorrect.
Score: 0

Scoring Answers:
y(x) = c_1 e^{-x} + c_2 e^{2x} + \frac{1}{4} e^{-x} \sin x

7) The general solution of differential equation

y''' + 2y'' + 4y' - 8y = 0

can be written as

y(x) = (c_1 + c_2) x^2 + c_3 e^{-2x}

y(x) = (c_1 + c_2) x^2 + c_3 e^{2x}

No, the answer is incorrect.
Score: 0

Scoring Answers:
y(x) = (c_1 + c_2) x^2 + c_3 \sin 2x

9) The general solution of the differential equation

y''' + y'' + y = e^{-x^2} \cos \left( \frac{x^2}{2} \sqrt{3} \right)

can be written as

y(x) = e^{-x^2/2} (c_1 \cos \frac{x^2}{2} + c_2 \sin \frac{x^2}{2}) + e^{x^2/2} (c_3 \cos \frac{x^2}{2} + c_4 \sin \frac{x^2}{2}) + \frac{1}{2} e^{-x^2} \cos \left( \frac{x^2}{2} \sqrt{3} \right)

y(x) = e^{-x^2/2} (c_1 \cos \frac{x^2}{2} + c_2 \sin \frac{x^2}{2}) + e^{x^2/2} (c_3 \cos \frac{x^2}{2} + c_4 \sin \frac{x^2}{2}) + \frac{1}{2} e^{-x^2} \cos \left( \frac{x^2}{2} \sqrt{3} \right)

No, the answer is incorrect.
Score: 0

Scoring Answers:
y(x) = e^{-x^2/2} (c_1 \cos \frac{x^2}{2} + c_2 \sin \frac{x^2}{2}) + e^{x^2/2} (c_3 \cos \frac{x^2}{2} + c_4 \sin \frac{x^2}{2}) + \frac{1}{2} e^{-x^2} \cos \left( \frac{x^2}{2} \sqrt{3} \right)

10) The general solution of the differential equation

y'' + 2y' = x^2 + 3e^{-x} + 4 \sin x

can be written as

y(x) = c_1 e^{2x} - 2e^{-x} + \frac{1}{4} e^{-x} \sin x

y(x) = c_1 e^{2x} - 2e^{-x} + \frac{1}{4} e^{-x} \sin x

No, the answer is incorrect.
Score: 0

Scoring Answers:
y(x) = c_1 e^{2x} - 2e^{-x} + \frac{1}{4} e^{-x} \sin x

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No, the answer is incorrect.
Score: 0
Accepted Answers:
\[ y(x) = c_1 e^{-2x} + x^3 (\cos x + \sin x) + \left( \frac{1}{2} (x^2 + x + \frac{3}{2}) + \frac{3}{2} e^{-2x} + \frac{4}{5} (3 \cos x + 4 \sin x) \right) \]