

Discussion 29: Second-Order Non-homogeneous Linear Equations

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I The Method of Undetermined Coefficients

Solve the differential equation using the method of undetermined coefficients.

1. $9y'' + y = e^{2x}$

2. $y'' - 4y' + 5y = e^{-x}$

3. $y'' - 4y' + 4y = x - \sin x$

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

Solve the following initial-value problem using method of undetermined coefficients.

1. $y'' - 2y' + 5y = \sin x, y(0) = 1, y'(0) = 1$

2. $y'' - y = xe^{2x}, y(0) = 0, y'(0) = 1$

3. $y'' + y' - 2y = x + \sin 2x, y(0) = 1, y'(0) = 0$

Write a trial solution for the method of undetermined coefficients. Do not determine the coefficients.

1. $y'' - ey' + 2y = e^x + \sin x$

2. $y'' + 2y' + 10y = x^2e^{-x} \cos 3x$

3. $y'' - 6y' + 9y = e^{3x} + x \sin 2x$