

Shepley L. Ross *Introduction to Ordinary Differential Equations*

Chapter 4. Explicit Methods of Solving Higher-Order Linear Differential Equations

4.2. The Homogeneous Linear Equation with Constant Coefficients

- 4.2.1.** Find the general solution: $y'' - 5y' + 6y = 0$.
- 4.2.7.** Find the general solution: $4y'' - 4y' + y = 0$.
- 4.2.9.** Find the general solution: $y'' + 6y' + 11y = 0$.
- 4.2.15.** Find the general solution: $y''' - y'' + y' - y = 0$. HINT: $m = 1$ is a zero of the auxiliary equation.
- 4.2.27.** Find the general solution: $y^{(4)} + 8y'' + 16y = 0$.
- 4.2.33.** Find the general solution: $y^{(6)} + 3y^{(4)} + 3y'' + y = 0$. HINT: $m^6 + 3m^4 + 3m^2 + 1 = (m^2 + 1)^3$.
- 4.2.37.** Solve the initial-value problem: $y'' - y' - 12y = 0$, $y(0) = 3$, $y'(0) = 5$.
- 4.2.41.** Solve the initial-value problem: $y'' + 6y' + 9y = 0$, $y(0) = 2$, $y'(0) = -3$.
- 4.2.45.** Solve the initial-value problem: $y'' - 4y' + 29y = 0$, $y(0) = 0$, $y'(0) = 5$.
- 4.2.59.** The roots of the auxiliary equation, corresponding to a certain 10th-order homogeneous linear differential equation with constant coefficients, are $4, 4, 4, 4, 2 + 3i, 2 - 3i, 2 + 3i, 2 - 3i, 2 + 3i, 2 - 3i$. Write the general solution.