

1. Find the solution to the IVP

$$y'' + y' + 4y = 0, \quad y(0) = 2, \quad y'(0) = 1$$

Graph the solution on the interval  $[0, 10]$ .

2. Use the method of undetermined coefficients to find the general solution for

$$y'' + 2y' + 2y = 2e^{-t} \cos t$$

3. Use the method of variation of parameters to find the general solution for

$$y'' + y = \csc t$$

4. Compute the Wronskian of the two functions  $y_1 = t^2$  and  $y_2 = t^3$ . Is it possible for  $\{t^2, t^3\}$  to be a basic set of solutions for a differential equation of the form  $y'' + a(t)y' + b(t)y = f(t)$  on the interval  $I = (-1, 1)$ . Assume that  $a(t), b(t), f(t) \in C^0(I)$ .