- 1. Find a particular solution to each of the following second-order equations for y = y(t):
  - (a)

$$y'' + 2y' + y = 10 + 2e^{-t};$$

(b)

$$y'' + 2y' + 2y = 4te^{-t}\cos t;$$

(c)

$$y'' + 2y' + y = 3e^{-t}\sqrt{t+1};$$

(d)

$$y'' + 3y' + 2y = \frac{1}{e^t + 1}$$

2. Find the general solution to the equation for y = y(x),

$$y'' + 4y' + 4y = e^{-2x} \sec^2 x,$$

- (a) by using reduction of order (*what would be a good choice for a solution to the homogeneous equation?*); and
- (b) by using variation of parameters.
- 3. Find general solutions to the equations for y = y(t):
  - (a)  $4t^2y'' - 8ty' + 9y = 0, \quad t > 0;$ (b)  $2t^2y'' + 4ty' - 2y = 0, \quad t < 0.$