Homework 6

> **Instructions**: Complete each of the following on separate, stapled sheets of paper.

1. Give general solutions to each of the following homogeneous linear ODEs.

    (a) $y'' - y' - 6y = 0$

    (b) $y'' + 6y' + 9y = 0$

    (c) $y'' + 25y = 0$

    (d) $y''' - 4y'' - 5y' = 0$

    (e) $y''' - 5y'' + 3y' + 9y = 0$

    (f) $y''' + y'' - 2y = 0$

    (g) $y''' - y'' - 4y$

    (h) $y^{(4)} + y^{(3)} + y^{(2)} = 0$

    (i) $y^{(4)} - y^{(2)} + y = 0$

    (j) $16y^{(4)} + 24y^{(2)} + 9y = 0$

2. Solve the IVPs given below.

    (a) $y'' + 16y = 0; \quad y(0) = 2, \quad y'(0) = -2$

    (b) $y'' - 4y' - 5y = 0; \quad y(1) = 0, \quad y'(1) = 2$

    (c) $y''' + 12y'' + 36y' = 0; \quad y(0) = 0, \quad y'(0) = 1, \quad y''(0) = -7$