

**Assignment 4**

1. Find a particular solution of the following second order equation

$$y'' + 3y' + 2y = 2 \cos x - \sin x.$$

2. Find a particular solution of the following second order equation

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

3. Find the general solution of the following second order equation

$$y'' + 6y' + 8y = \cos x.$$

4. Find the general solution of the following second order equation

$$y'' + 4y' + 20y = -3 \sin(2t).$$

5. Find the solution of the given initial-value problem

$$y'' + 4y' + 20y = -3 \sin(2t), \quad y(0) = y'(0) = 0.$$

6. Find a particular solution of the equation

$$y'' + 3y' + y = -\cos(3t),$$

a) by using the guess

$$y_p = a \cos(3t) + b \sin(3t),$$

where  $a$  and  $b$  are undetermined coefficients

b) by using the guess

$$y_p = A \cos(3t + \theta),$$

where  $A$  and  $\theta$  are undetermined coefficients.