MATH266: Second midterm exam, April 12th

Name: _____

1. Find the general solution to
$$y''' + 10y'' + 25y' = 0$$

2. Find the solution to the initial value problem using the method of an educated guess
$$y'' + y = 8\cos 2t, \quad y(\pi/2) = 1, \quad y'(\pi/2) = 0.$$

3. A mass of 3 kg is attached to a spring with constant $k = 12$ N/m and put into equilibrium. After this the spring is stretched 1 m and given the initial velocity of 1 m/sec back towards its equilibrium position (this means that the sign of the initial velocity is negative). Assuming that there is no damping find the angular frequency, period, and amplitude of the motion.

4. Solve using the Laplace transform method
$$y'' + 2y' + y = \sin t, \quad y(0) = 0, y'(0) = -1$$