Worksheet 2

MATH 33B

1. Use the method of integrating factors to solve the IVP

$$ty' + y = e^t, y(0) = 1.$$

2. Consider the nonhomogeneous linear differential equation

$$y' = 2y + 3t.$$

   (a) Solve the corresponding homogeneous equation.

   (b) Use undetermined coefficients to find a particular solution.

   (c) Find the general solution to the equation.

3. Find the general solutions for the following homogeneous second-order ODEs:

   - $y'' + 6y' + 5y = 0$.
   - $y'' - y = 0$.
   - $y'' + y = 0$.
   - $y'' + 2y' + y = 0$.

4. Solve the nonhomogeneous differential equation

$$y'' + 3y' + 2y = t, y(0) = 1, y'(0) = 1,$$

   using the method of undetermined coefficients.