Homework Assignment #4 (due on Wednesday, April 3).
The problems are based on Sections 4.1–4.4 in the textbook.

In each of Problems 1 and 2, verify that the given functions are solutions of the differential equation, and determine their Wronskian.

#1. 
\[ y'''' + y' = 0; \quad y_1 = 1, \quad y_2 = \cos t, \quad y_3 = \sin t. \]

#2. 
\[ x^3 y'''' + x^2 y''' - 2xy' + 2y = 0; \quad y_1 = x, \quad y_2 = x^2, \quad y_3 = 1/x. \]

In each of Problems 3 through 6, determine the general solution of the given differential equation.

#3. 
\[ y^{(8)} + 8y^{(4)} + 16y = 0. \]

#4. 
\[ y'''' + 5y''' + 6y' + 2y = 0. \]

#5. 
\[ y^{(4)} - y = 3t + \cos t. \]

#6. 
\[ y^{(4)} - 4y' = t^2 + e^t. \]

#7. Use the method of variation of parameters to determine the general solution of the given differential equation:
\[ y'''' + y' = \frac{1}{\cos t}. \]

#8. Using ANY method, not only method variation of parameters, determine the general solution of the given differential equation:
\[ y'''' - y'' + y' - y = e^{-t} \sin t. \]