Differential Equations
Problem Set 9
The Method of Variation of Parameters

1. Use the method of variation of parameters to find a particular solution of the given differential equation.

   (a) $\ddot{x} - \dot{x} - 2x = e^{-t}$

   (b) $4\ddot{x} - 4\dot{x} + x = 16e^{t/2}$

2. Find the general solution of the given differential equation.

   (a) $\ddot{x} + x = \tan t$, $0 < t < \pi/2$

   (b) $\ddot{x} + 9x = 9\sec^2(3t)$, $0 < t < \pi/6$

   (c) $\ddot{x} + 4\dot{x} + 4x = t^{-2}e^{-2t}$, $t > 0$

   (d) $\ddot{x} - 2\dot{x} + x = \frac{e^t}{1+t^2}$