Math 2410-10/15 **Quiz #9** **April 24^{th}, 2017**

Note: Partial credit can not be awarded unless there is legible work to assess. Feel free to use the back of this page if you require additional space for your solutions.

1. In class we verified half of the extended linearity principle for linear second order differential equations. Verify the second half.
   That is, show that if $y_1(t)$ and $y_2(t)$ are solutions to

$$\frac{d^2y}{dt^2} + p\frac{dy}{dt} + qy = g(t)$$

   then $y_1(t) - y_2(t)$ is a solution to the associated homogeneous equation.

2. Find the general solution of the following nonhomogeneous linear second-order differential equation.

$$\frac{d^2y}{dt^2} - 4\frac{dy}{dt} - 12y = 81e^{-3t}$$