Math 274 — Quiz 8 — Name: ____________________

12 July 2017 — Show Appropriate Work — Point Values in $\boxed{\text{boxes}}$.

1. $\boxed{6}$ Find the appropriate form using the Method of Undetermined Coeffients for a particular solution to the following. **Do not** solve for the unknown constants.

   (a) $y'' - 2y' + y = t^2e^t$

   $(r-1)^2 = 0$ so $r=1$ is a double root

   $y_p = t^2\left(At^2 + Bt + C\right)e^t$

   (b) $y'' - 2y' + y = te^{2t} + 3e^{4t}$

   $y_p = (At+B)e^{2t} + Ce^{4t}$

   (c) $y'' - 2y' + y = te^t \cos 2t$

   $y_p = (At+B)e^t \cos 2t + (Ct+D)e^t \sin 2t$

2. $\boxed{4}$ Find the general solution for

$$y'' - 3y' + 2y = (12t+8)e^{-t}$$

$r^2 - 3r + 2 = 0$

$(r-2)(r-1) = 0$

$r=2$ or $r=1$

$y_p = (At+B)e^{-t}$

$y_p' = (A - At - B)e^{-t}$

$y_p'' = (-A - A + At + B)e^{-t}$

substituting yields

$$[-2A + \underline{At} + B]e^{-t} + [-3A + \underline{3At} + 3B]e^{-t} + [2At + 2B]e^{-t} = (12t+8)e^{-t}$$

te^{-t}: $A + 3A + 2A = 12 \Rightarrow A = 2$

e^{-t}: $-2A + B - 3A + 3B + 2B = 8$

$6B = 18 \Rightarrow B = 3$

so $y = C_1e^t + C_2e^{2t} + (2t+3)e^{-t}$