Math 311 Optional Test   Name_____

1. Solve the following initial value problems:

a. $\dfrac{dy}{dz} = 5 - \dfrac{y}{z}$; $y(1)=3$.

b. $y' = (y^2/x^2) + (y/x)$; $y(1) = 1$

c. $y'' - y = 2\,e^t$; $y(0)=0$; $y'(0)=3$.

2. Find general solutions to the following:

a. $y'' + 4y' + 3y = 16\,e^t$

b. $9y' + 6\,y' + y = \frac{1}{4}\,t^2 - 14$

3. I accidentally left a sheet pan in the oven overnight at 400°. When I removed the pan in the morning it was completely heated to 400°. Ten minutes later it had cooled to 232°. I keep my house at 64°. How "hot" would the pan have been t minutes after I removed it from the oven? How about an hour after it came out of the oven? (Assume Newton's Law of Cooling applies).