

**Homework #3**  
**ECE 551, Sp'08**  
**Due: Friday, April 18, 2008**

(1) E5.2: (a) Compute the steady state error using the final value theorem (i.e., theoretically) and then find it via doing a simulation with Matlab. (b) Use Matlab to find the amount of overshoot.

(2) E5.5, but do the following (do not do a, b, etc. in the text): Find the system type. What is the steady state error due to a step input? What is the steady state error if the input is a ramp? What is the steady state error if the input is a parabola (i.e.,  $r(t)=t^2$  for  $t \geq 0$  and  $r(t)=0$ ,  $t \leq 0$ )? Solve this problem using the final value theorem (although you could use Matlab to verify your results).

(3) E5.8