Homework #7: ECE 461/661

Error Constants, Routh Criteria, Skething a Root Locus. Due Monday, October 13th

Error Constants

1) Determine the error constants and steady-state error for the following systems

G(s)	System Type	Kp	Kv	Error for a unit step input
$\left(\frac{20}{(s+2)(s+10)}\right)$				
$\left(\frac{20}{s(s+2)(s+10)}\right)$				
$\left(\frac{20(s+0.3)}{s^2(s+2)(s+10)}\right)$				
$\left(\frac{20}{(s-2)(s+10)}\right)$				

Routh Criteria

Determine the range of k that results in a negative definite polynomial (i.e. a stable system)

2) $(s-2)(s+10)(s+12)+2k=0$

3) $(s+2)(s+5)(s+10)(s+12)+2k=0$

Sketching a Root Locus

Sketch the root locus plot for the following systems for 0 < k < infinity. Also plot the

- real axis loci, break away points, jw crossings (if any), and asymptotes

4) $(s-2)(s+10)(s+12)+2k=0$

5) $(s+2)(s+5)(s+10)(s+12)+2k=0$