ECE 421, Spring 2005, HW Assignment #8
Due Thursday, March 24, 2005

For each of the following systems, determine the closed-loop steady-state errors for unit step, ramp, and parabolic reference input signals in terms of K. You may assume that the closed-loop systems are stable.

$$G_p(s) = \frac{K(s+2)(s+6)}{(s+0.5)(s+3)(s+4)} \tag{1}$$

$$G_p(s) = \frac{K(s+1)(s+3)}{s(s+0.125)(s+2)(s+4)} \tag{2}$$

$$G_p(s) = \frac{K(s+3)(s+5)}{s^2(s+1)(s+2)^2} \tag{3}$$

$$G_p(s) = \frac{K(s+1)(s+2)(s+13)}{s^3(s+0.25)(s+4)(s+5)} \tag{4}$$

$$G_p(s) = \frac{K(s/7+1)(s/5+1)}{(s/0.25+1)(s/7+1)(s/2+1)} \tag{5}$$

$$G_p(s) = \frac{K(s/4+1)(s/7+1)}{s^2(s/2+1)(s/6+1)(s/8+1)(s/0.01+1)} \tag{6}$$

$$G_p(s) = \frac{K(s/5+1)(s/4+1)(s^2+4s+13)}{s(s/0.25+1)(s+4)(s/2+1)} \tag{7}$$

$$G_p(s) = \frac{K(s/3+1)(s/7+1)}{(s/0.5+1)(s/6+1)(s+2)(s/0.3+1)} \tag{8}$$

$$G_p(s) = \frac{K(s/4+1)(s/7+1)}{s(s/0.125+1)(s+3)(s/3+1)(s/0.02+1)} \tag{9}$$

$$G_p(s) = \frac{K(s/3+1)(s+7)(s^2+4s+13)}{s^2(s/0.25+1)(s+4)(s/15+1)(s/0.2+1)} \tag{10}$$