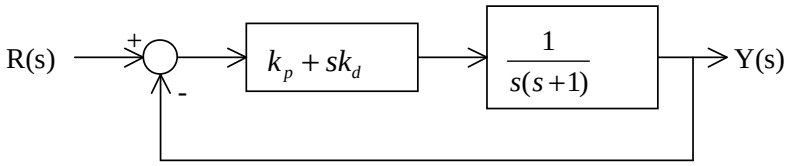
UC Berkeley

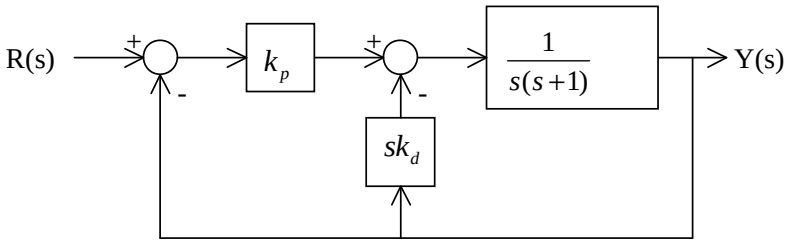
EE128 Homework #4

Due on 10/14/05

(1) The following figure shows a PD controller. Show that if the derivative term (sk_d) is replaced by the modified form : $\frac{s}{(0.1s+1)(0.001s+1)}k_d$ (a.k.a, pseudo differentiator), the system becomes unstable for a large value of k_p.



Hint: The above system has the same stability property as the system shown below. Replace the derivative term by the pseudo differentiator and use the concept of root locus.



(1) Textbook problem 5.6 (g)

(2) Textbook problem 5.7 (b) and (d)

(3) Textbook problem 5.22

(4) Textbook problem 5.33

(5) Textbook problem 5.37

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