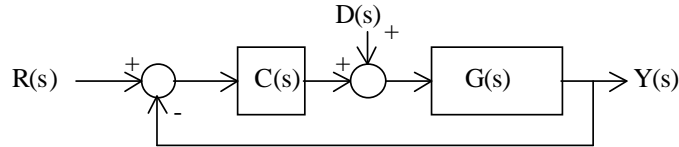
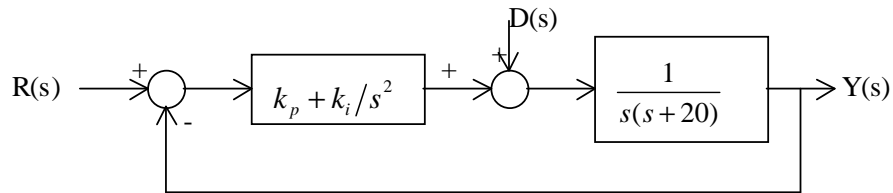


- (1) Textbook problem 4.13
- (2) Textbook problem 4.28.
- (3) Is a type K system w.r.t to input must also of type K w.r.t. disturbance? Is a type K system w.r.t to disturbance must also of type K w.r.t. input? Consider the following block diagram, under what condition (on C(s) and G(s)), both statements are true?



- (4.a) The following figure shows a PI²D controller. What is the type of the system w.r.t input and w.r.t disturbance?
- (4.b) Let $k_p=100$, what is the range of k_i in which the system is stable?
- (4.c) Use Simulink to demonstrate the tracking behavior of the system for the type of the system. Use a value of you choice for k_i so that the tracking error converges quickly.



- (5) We know that higher order integrators in the loop increases the system. What benefit, if any, does higher order differentiator in the loop have to offer? Use the following system as an example.

