01.5 intro.exe Exercises for Chapter 01 intro

Exercise 01.1 tabernacle

If a control system has a constant controller $C(s) = K$, unity feedback ($H(s) = 1$), and plant

$$G(s) = \frac{10}{(s+2)(s+5)},$$

what is the closed-loop transfer function? Express the result as a single fraction of polynomials in s.

Exercise 01.2 psalmody

What are the three primary performance criteria for most feedback control systems?

Exercise 01.3 calvous

Consider the block diagram of Fig. exe.1. Derive the transfer function from the command $R(s)$ to the error $E(s)$; that is, $E(s)/R(s)$. This is sometimes called the **error transfer function**.

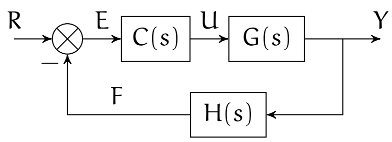

Figure exe.1: a block diagram with a controller $C(s)$.

Exercise 01.4 telesis

If a PID control system suffers from poor steady-state performance, which term of a PID controller—that is, P, I, or D—is most likely to help and why?

Exercise 01.5 postulant

If a PID control system suffers from slow transient response performance, increasing which PID terms—that is, of P, I, and D—are most likely to help and why?

Exercise 01.6 mascaron

A given feedback control system meets its transient performance requirements, but has a finite steady-state error for a unit step command. How might you recommend augmenting the controller to achieve zero steady-state error?

Exercise 01.7

Stability performance