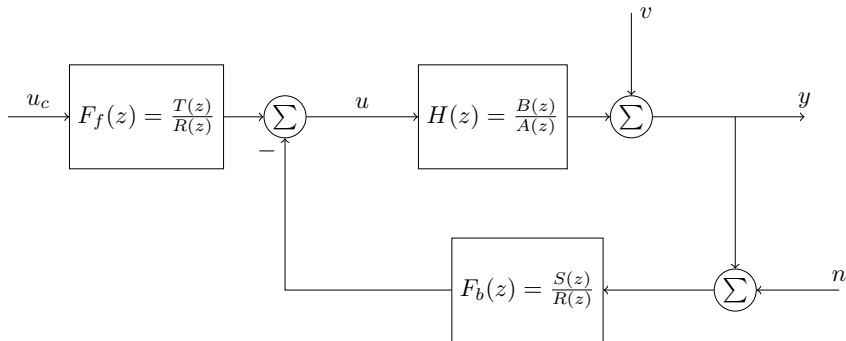


# Control computarizado - Asignación de polos

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## Two-degree-of-freedom controller



## Åström & Wittenmark problem 5.3

Consider the system given by the pulse-transfer function

$$H(z) = \frac{z + 0.7}{z^2 - 1.8z + 0.81}$$

Use polynomial design (RST) to determine a controller such that the closed-loop system from command input to output has the characteristic polynomial

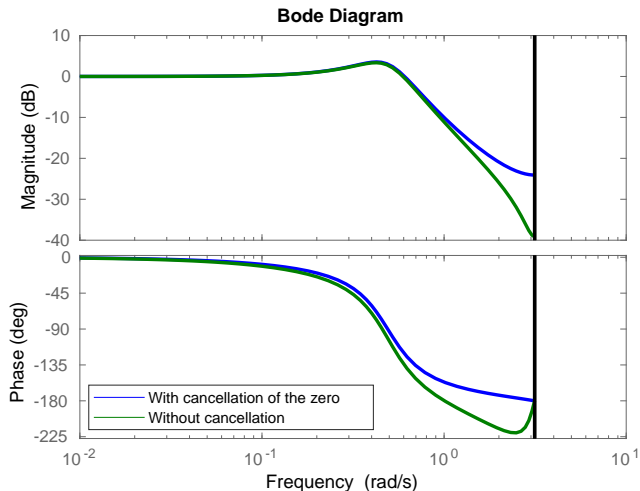
$$A_c(z) = z^2 - 1.5z + 0.7.$$

Let the observer polynomial have as low order as possible, and place all observer poles in the origin (deadbeat observer). Consider three cases

- (a) Positional control with cancellation of the process zero
- (b) Positional control with no cancellation of the zero
- (c) Incremental controller with no cancellation of the zero

## Why cancel the process zero?

Bode plots of closed-loop systems (from reference signal to output) with and without cancellation of the process zero:



## Preliminary exercise

Which of the closed-loop responses below corresponds to (I) Positional control with zero cancellation (II), Positional control without zero cancellation, (III) Incremental control without zero cancellation.

