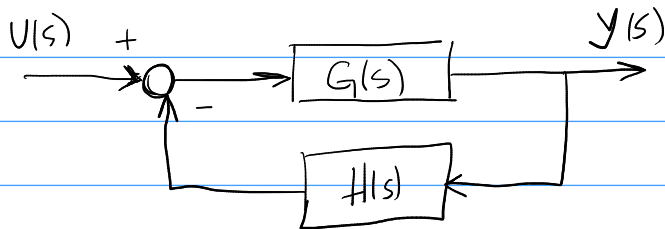


# Aufgabe 5.3

$$H(s) = k$$



"(...)" mit einem P-Regler geschlossene Kreis (...)"

$$\frac{y(s)}{U(s)}$$

$$y(s) = G(s) (U(s) - H(s)y(s)) \Rightarrow y(s) + H(s)y(s)G(s) = G(s)U(s)$$

$$y(s) (1 + H(s)G(s)) = G(s)U(s) \Rightarrow \frac{y(s)}{U(s)} = \frac{G(s)}{1 + H(s)G(s)}$$

$$G(s) = \frac{2(64s^2 + 8s + 17)}{(s^2 + 2s + 2)^2} - 4 = \frac{-4s^4 - 16s^3 + 96s^2 - 16s + 18}{s^4 + 4s^3 + 8s^2 + 8s + 4}$$

$$G_{cl}(s) = \frac{y(s)}{U(s)} = \frac{G(s)}{1 + G(s)H(s)} = \frac{-4s^4 - 16s^3 + 96s^2 - 16s + 18}{s^4 + 4s^3 + 8s^2 + 8s + 4} \cdot \frac{1}{1 + G(s) \cdot k} =$$

$$= \frac{-4s^4 - 16s^3 + 96s^2 - 16s + 18}{s^4 + 4s^3 + 8s^2 + 8s + 4 + k(-4s^4 - 16s^3 + 96s^2 - 16s + 18)}$$