

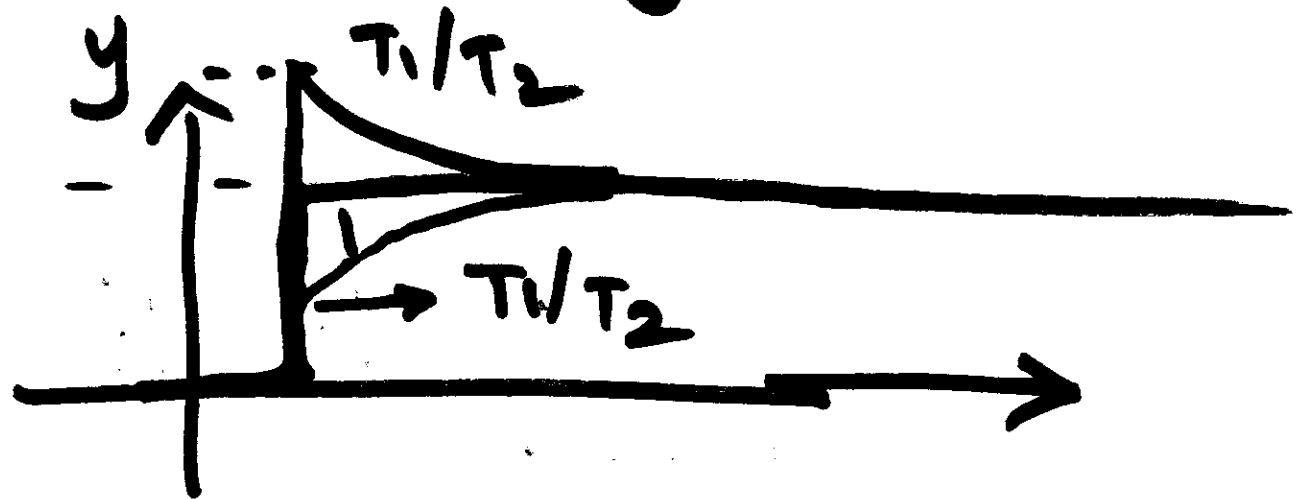
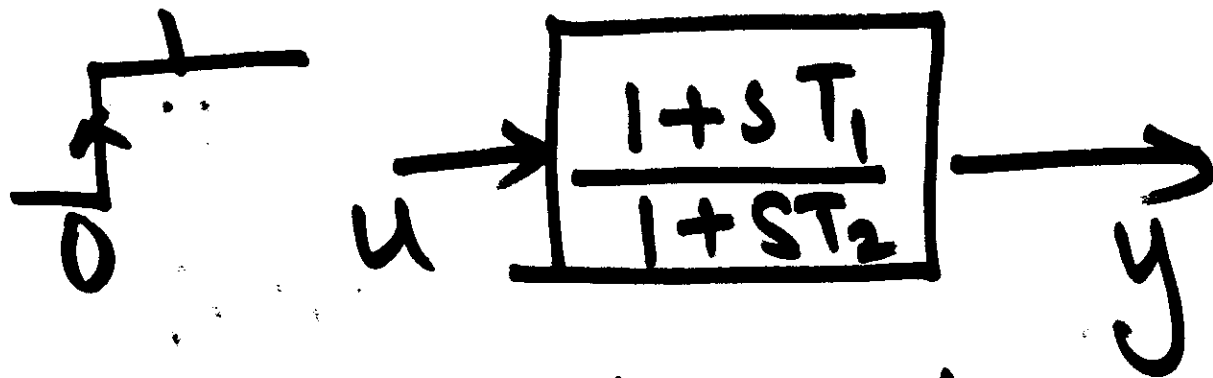
$$\frac{y(s)}{u(s)} = \frac{1 + sT_1}{1 + sT_2}$$

$$= k_1 + \frac{k_2}{1 + sT_2}$$

$$k_1 = T_1/T_2$$

$$k_2 = \frac{-(T_1 - T_2)}{T_2}$$

correction  $\nearrow$

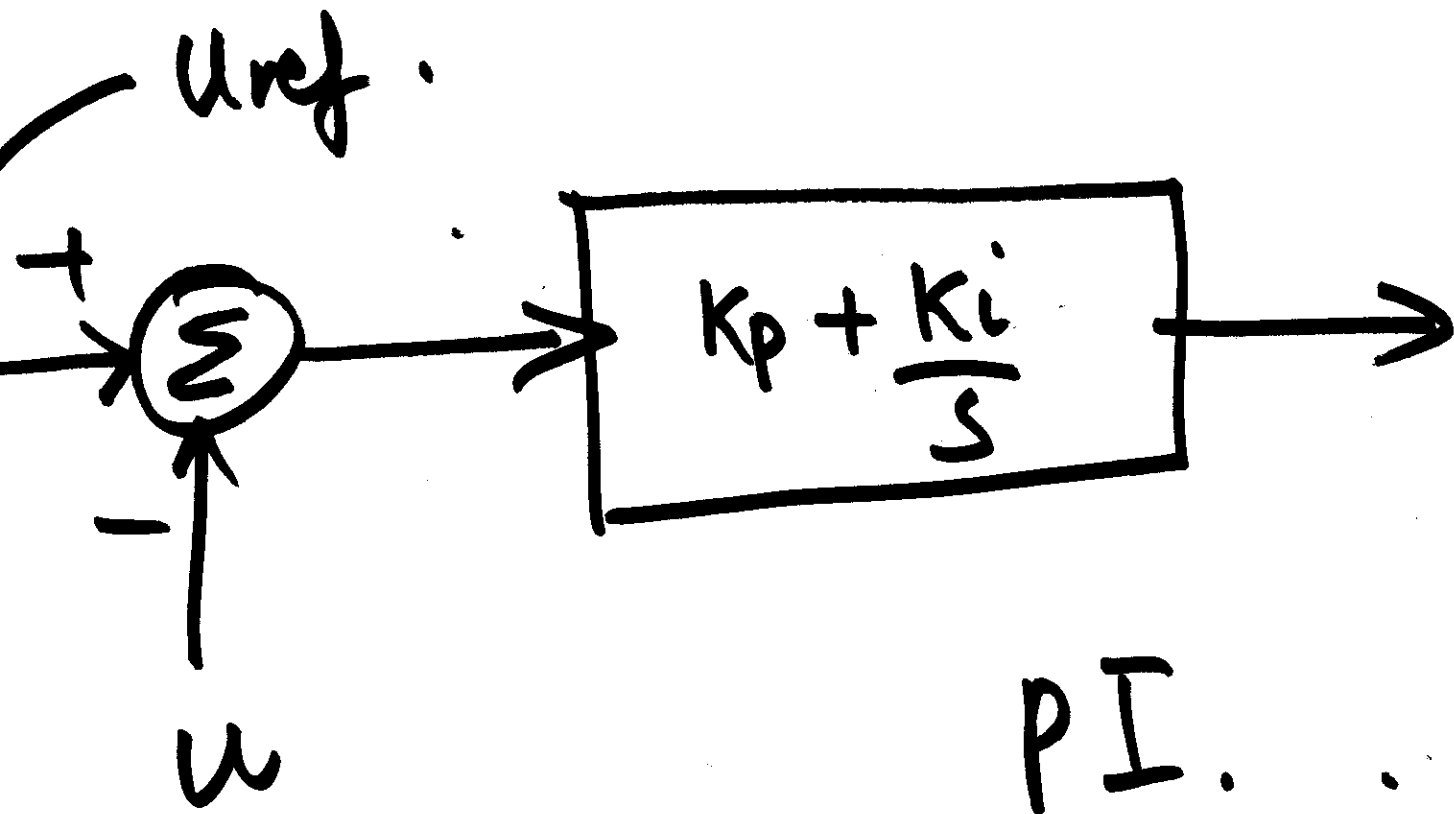


$$T_1 > T_2.$$

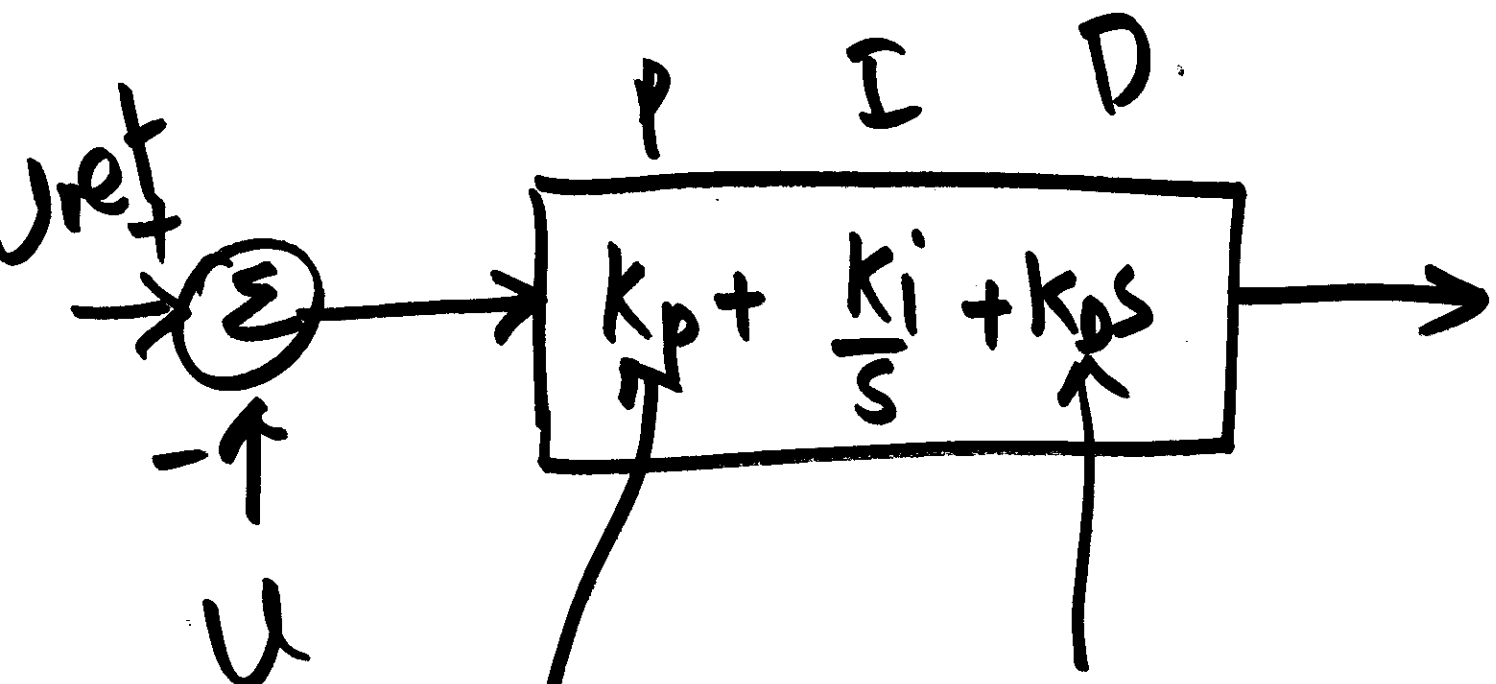
$$\frac{dx}{dt} = -\frac{1}{T_2} x + \frac{1}{T_2} u.$$

← correction.

$$y = -\left(\frac{T_1 - T_2}{T_2}\right) x + \left(\frac{T_1}{T_2}\right) u.$$



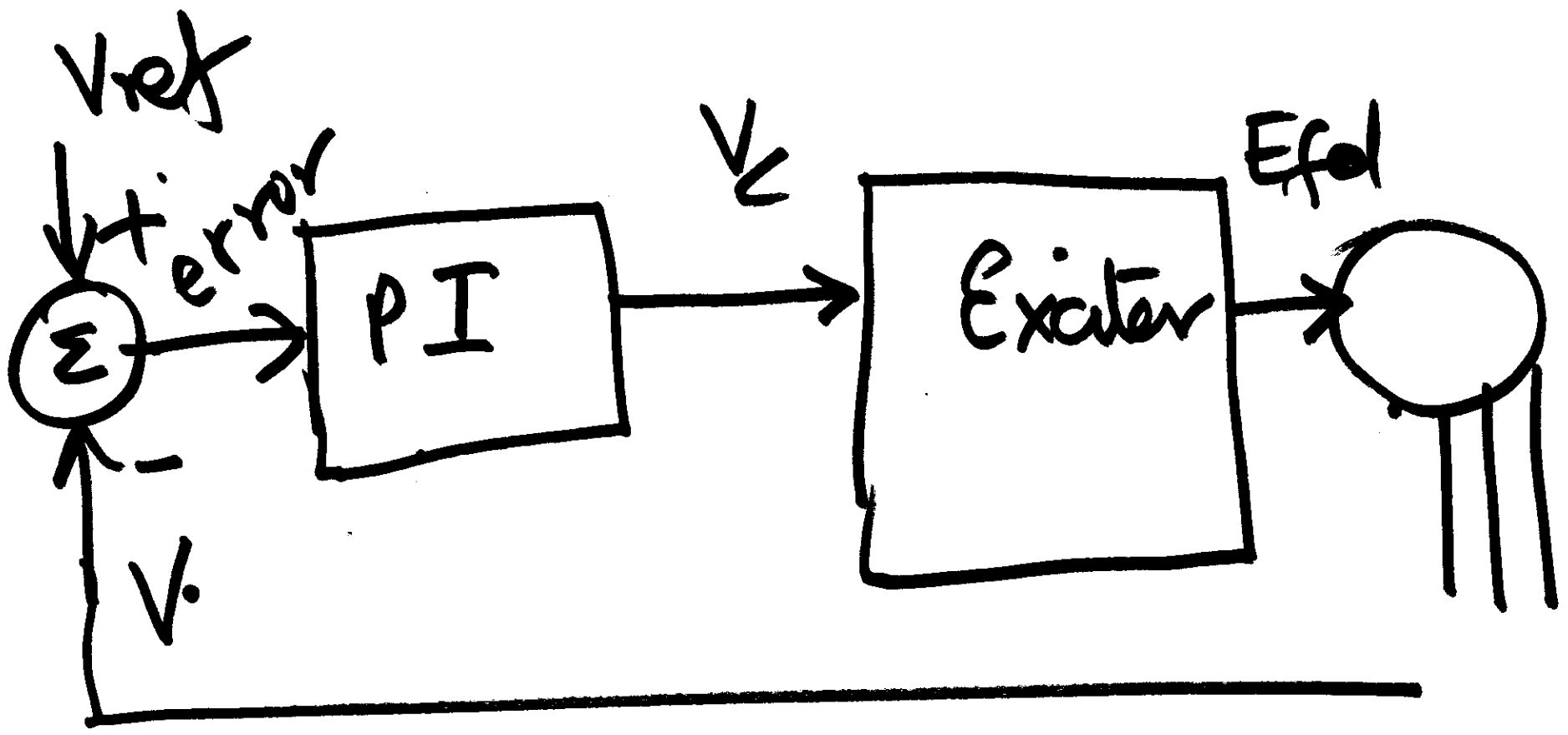
PI.

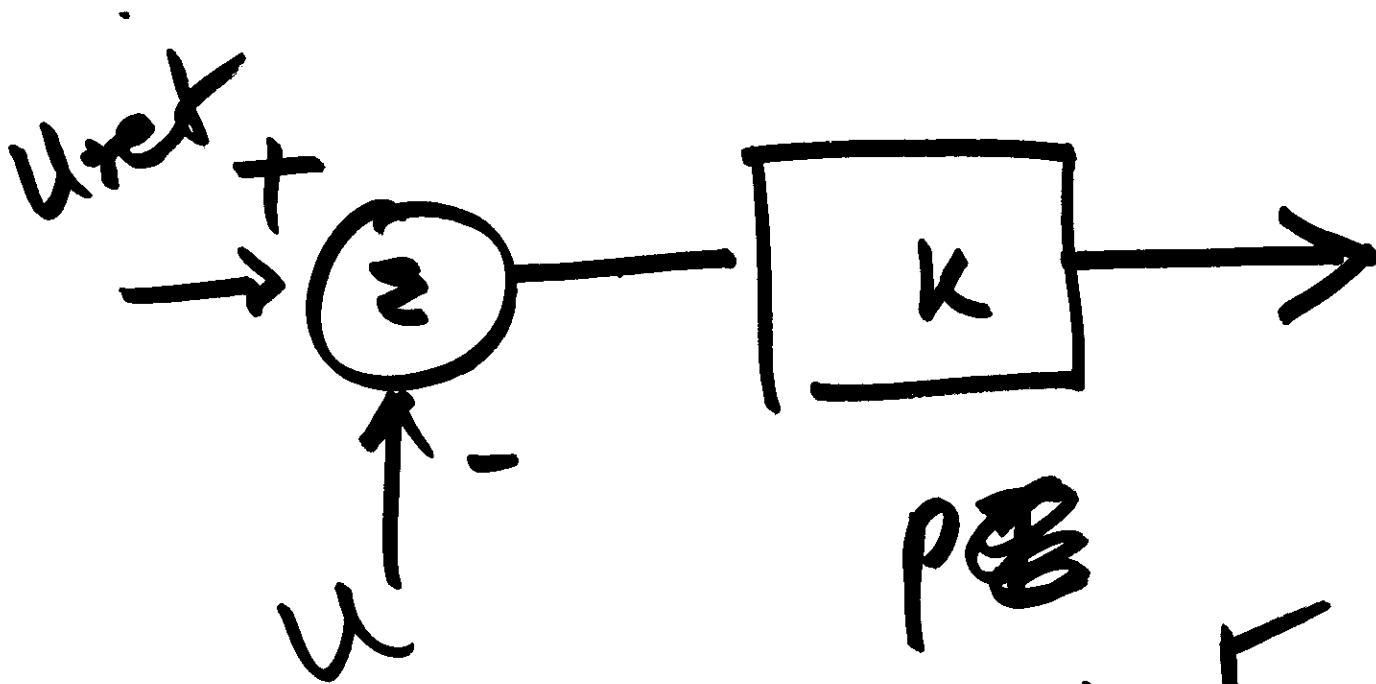


$$\frac{k_p}{1 + sT_p}$$

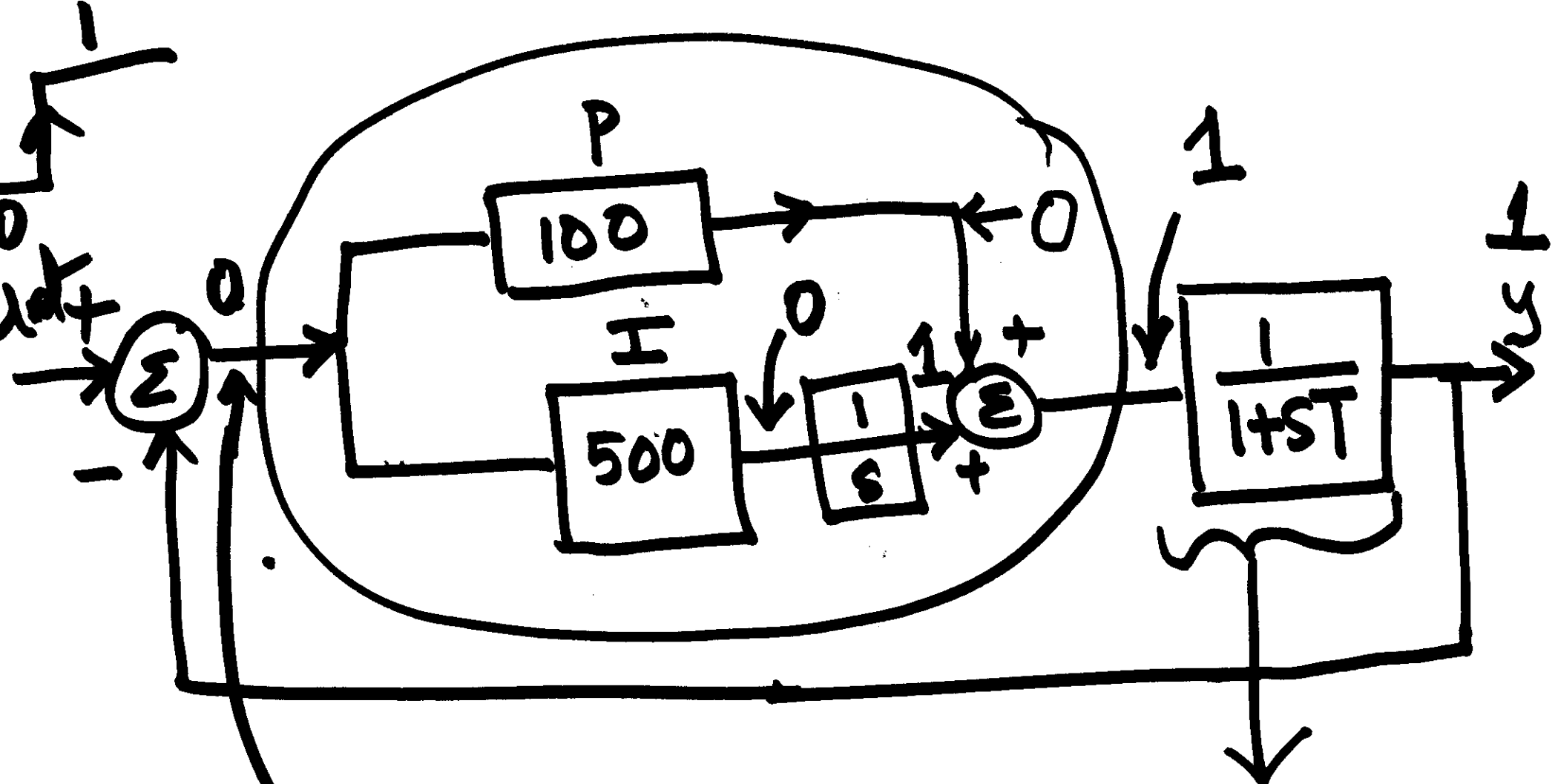
$$\frac{k_d s}{1 + sT}$$

$T$  very small.

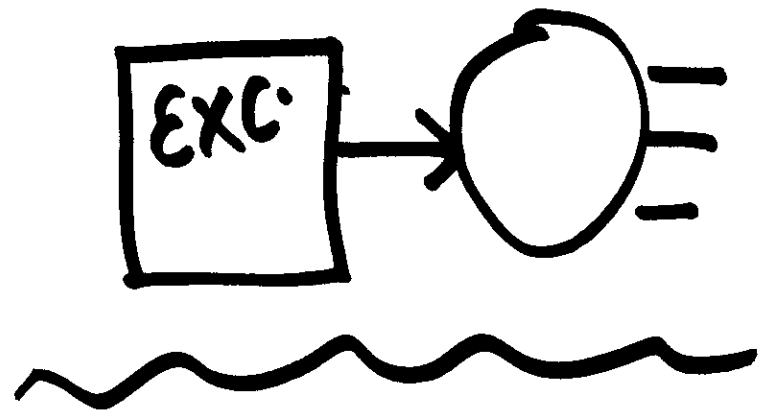




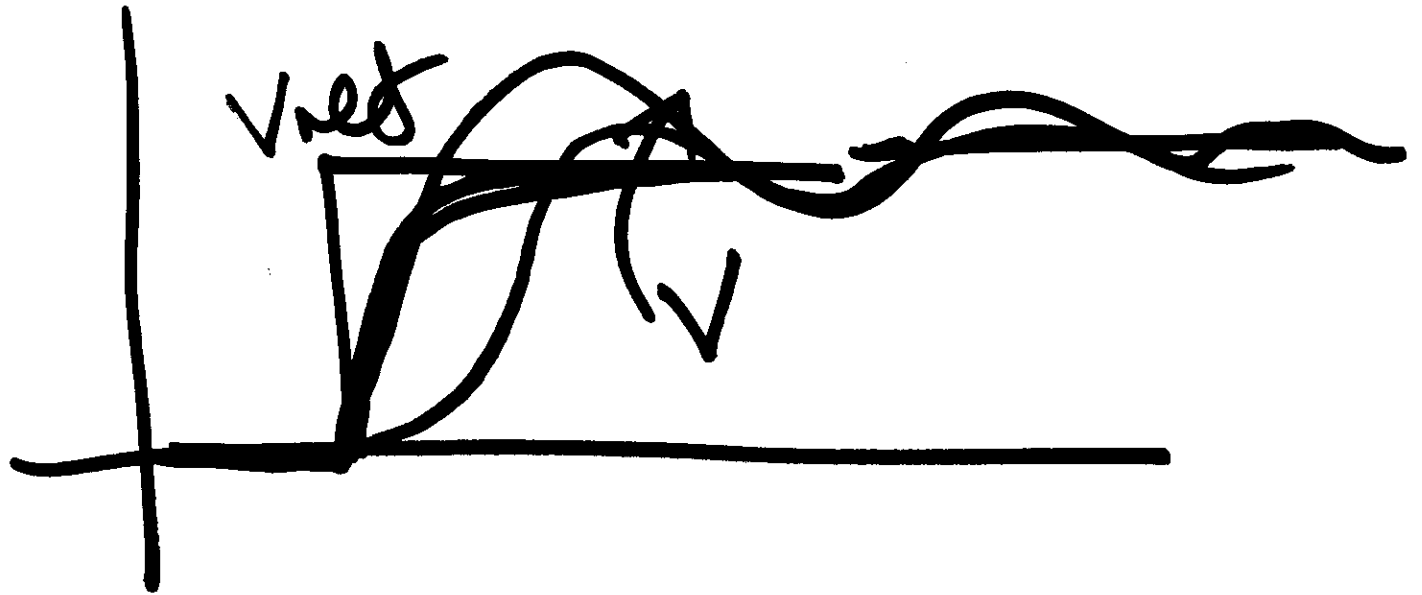
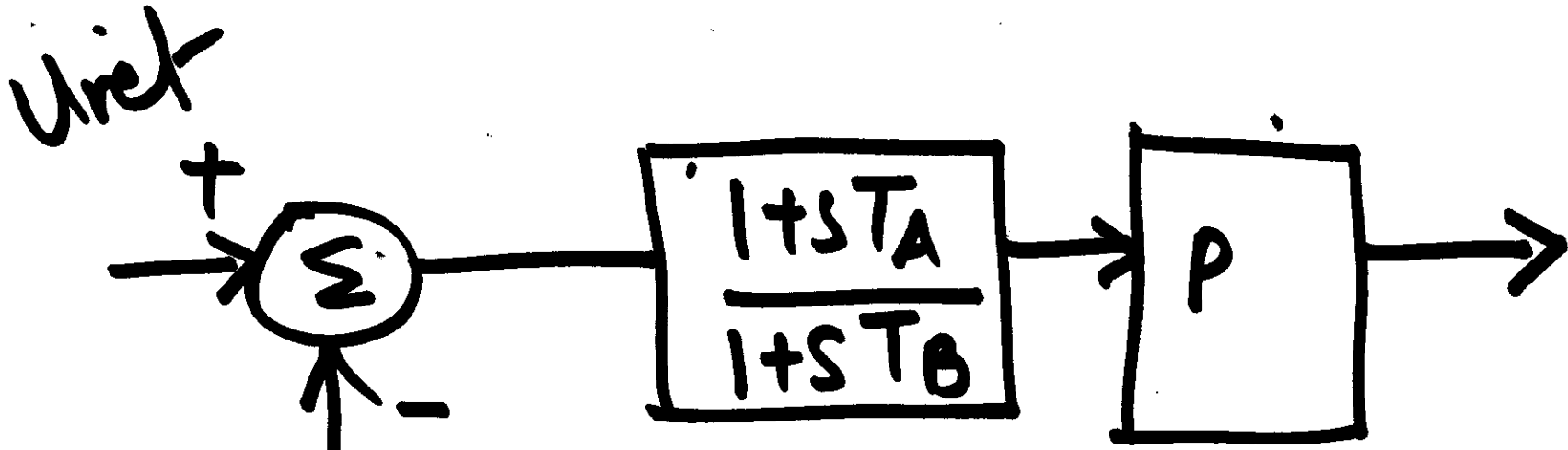
~~PE~~  
Steady state error  
 $\neq 0$

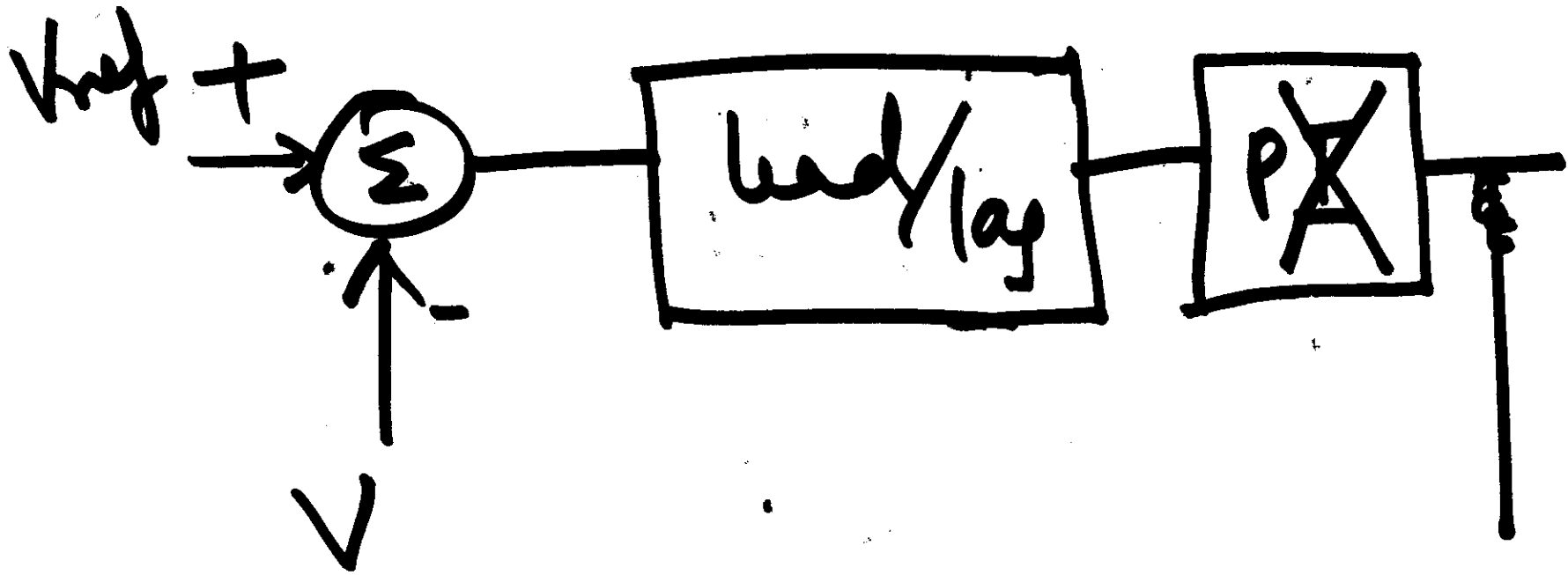


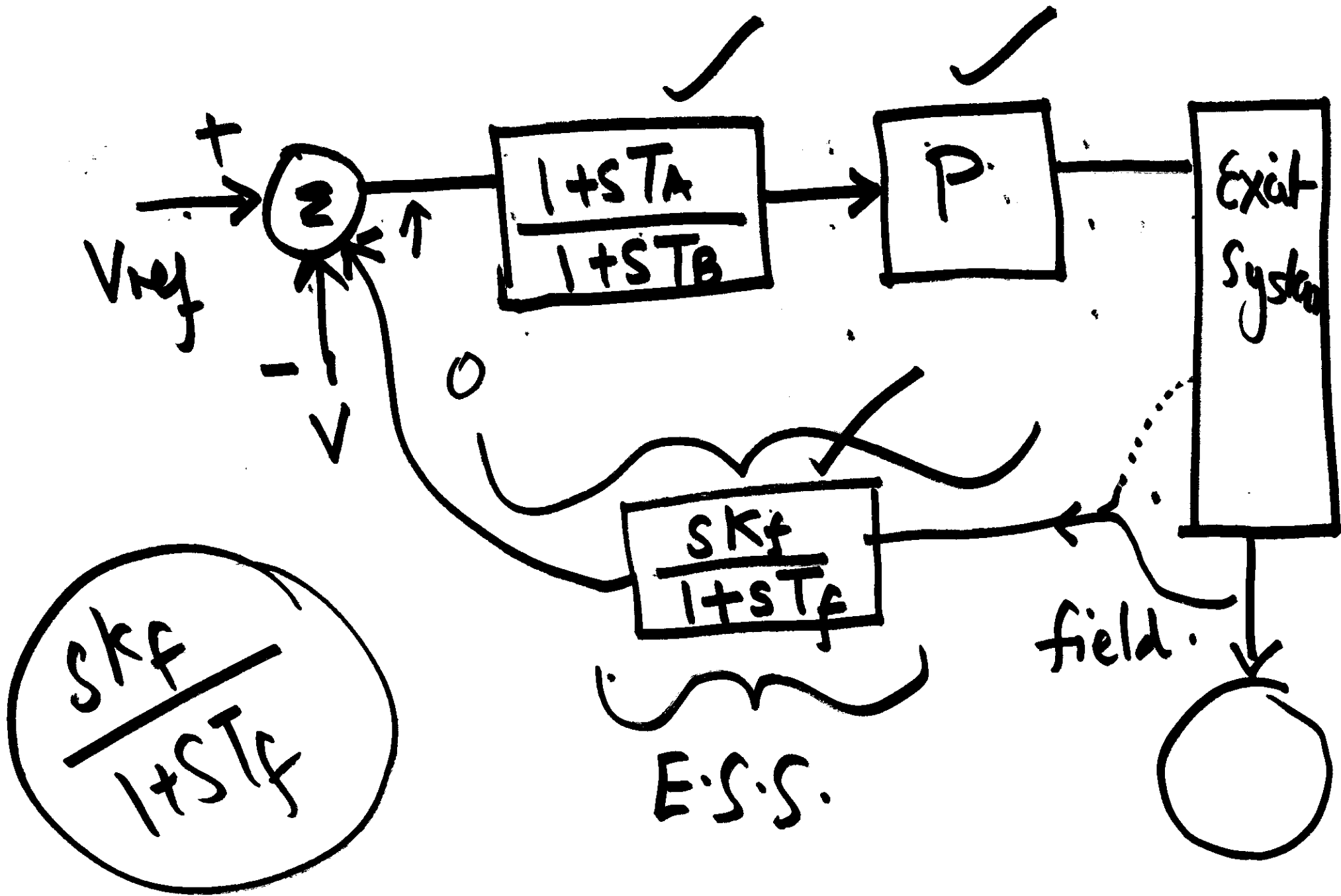
error = 0.

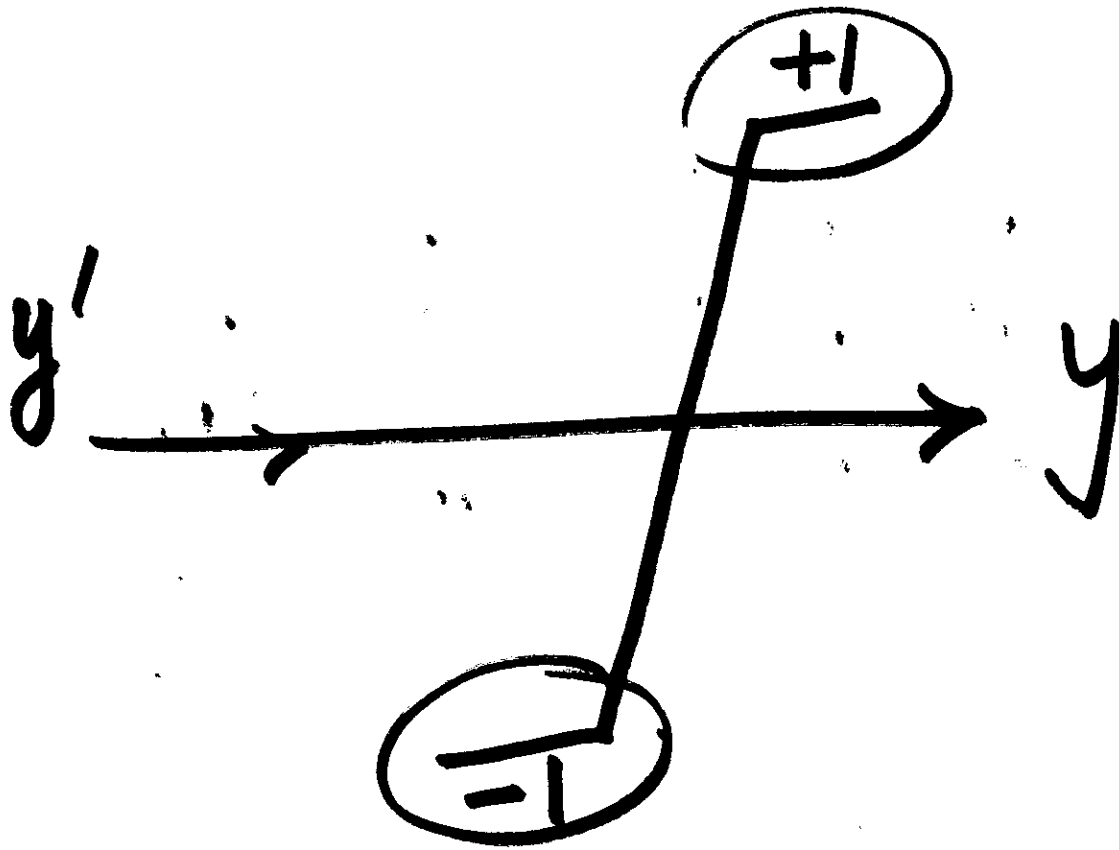






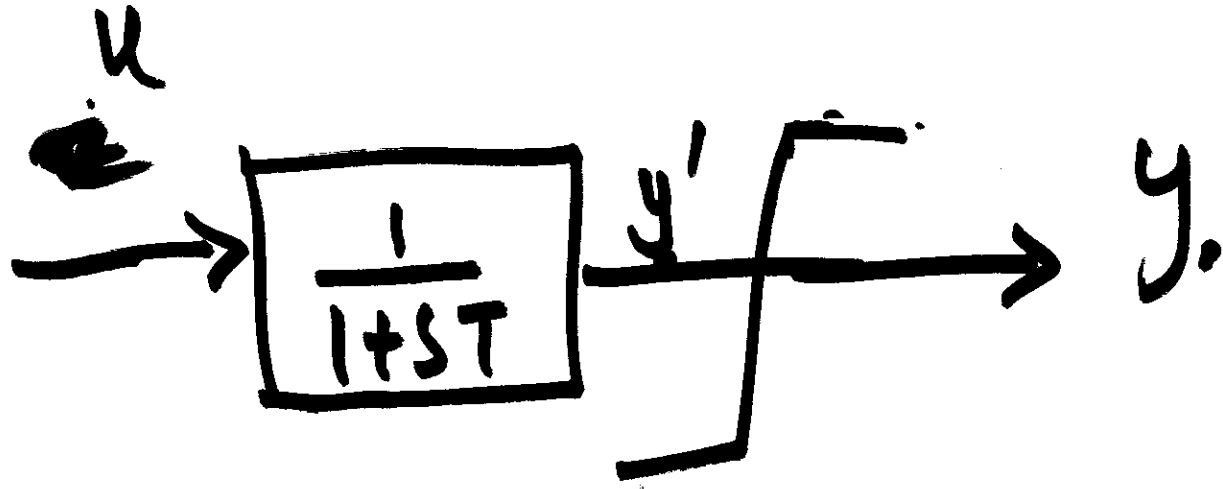


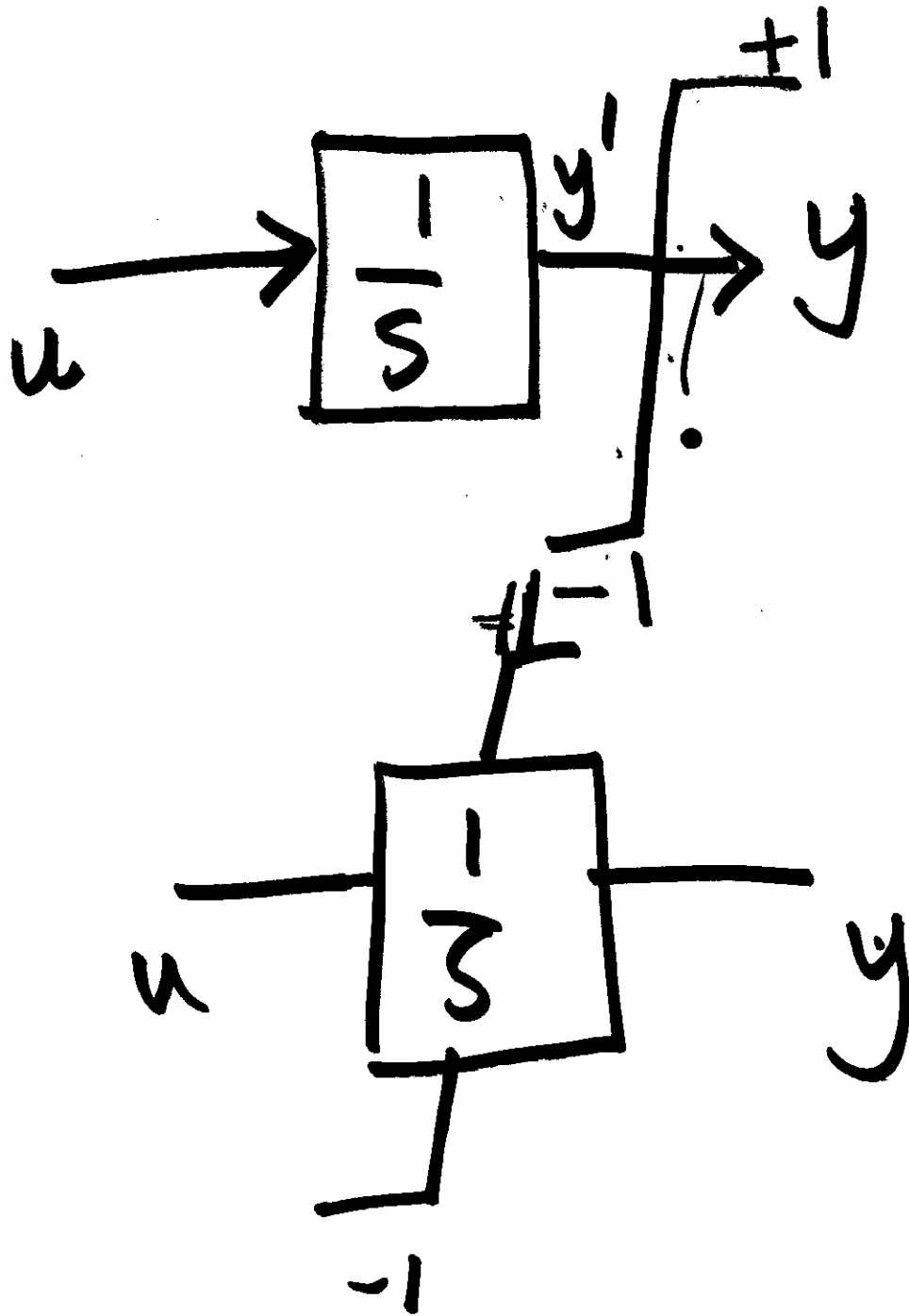




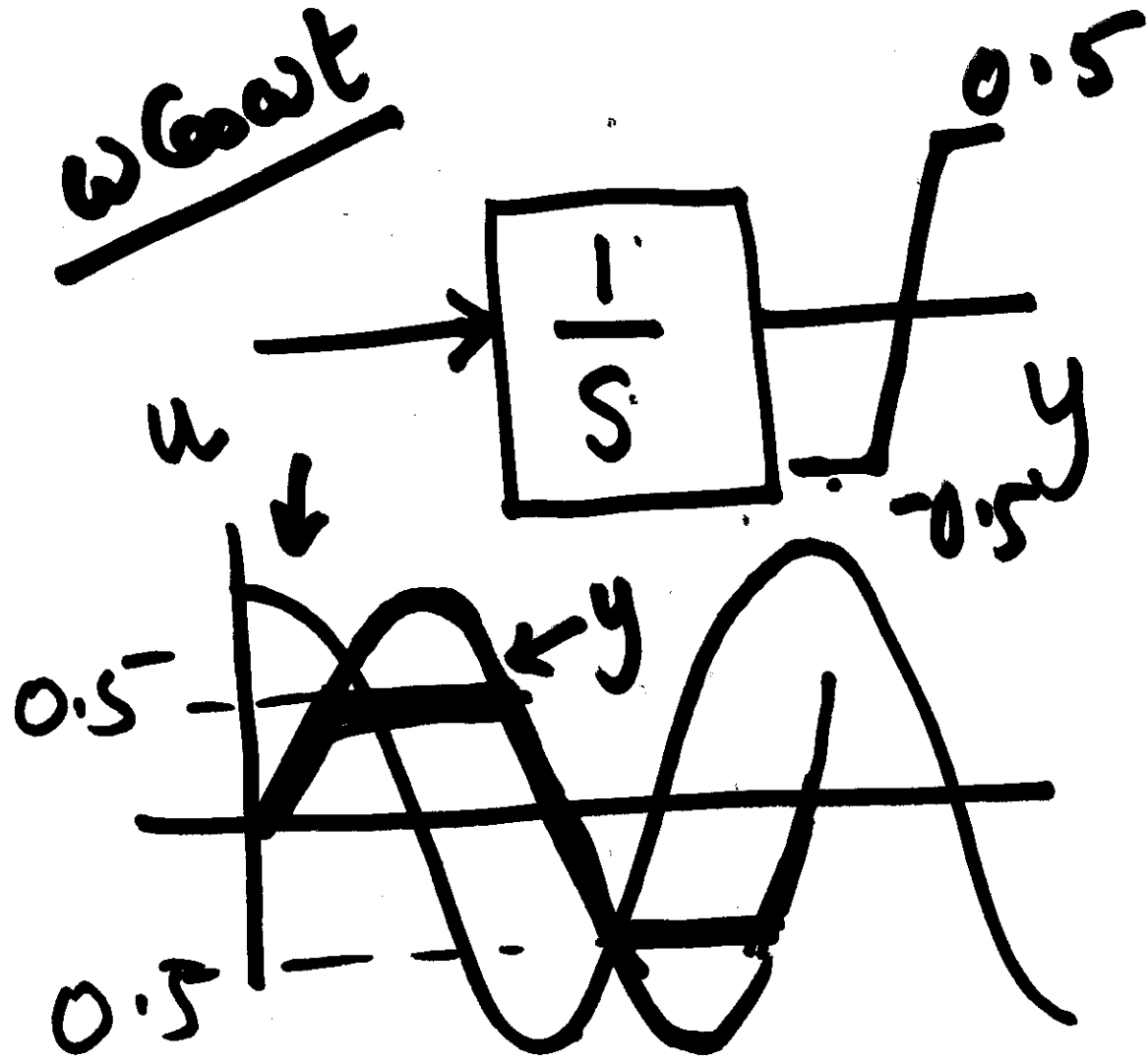
soft limiter

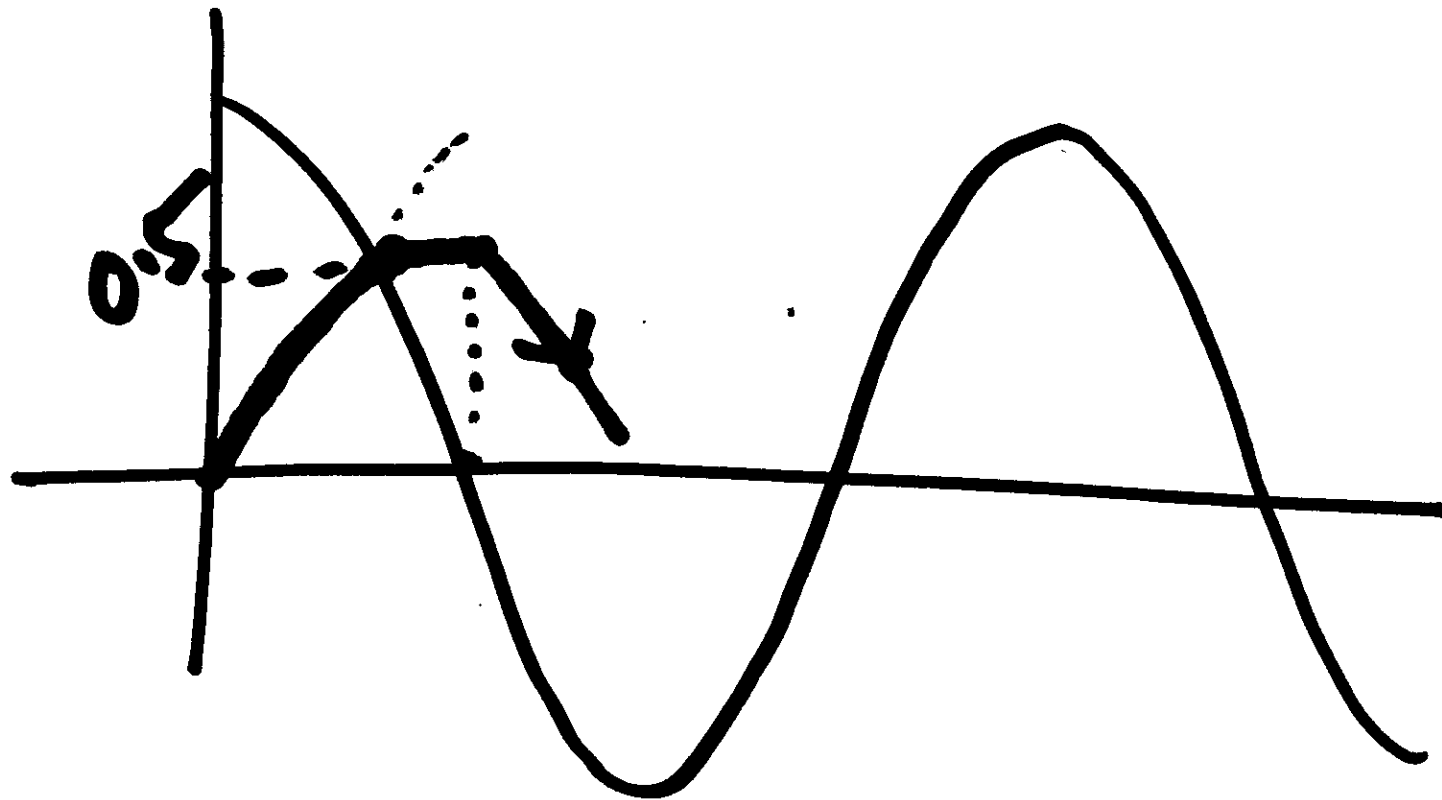
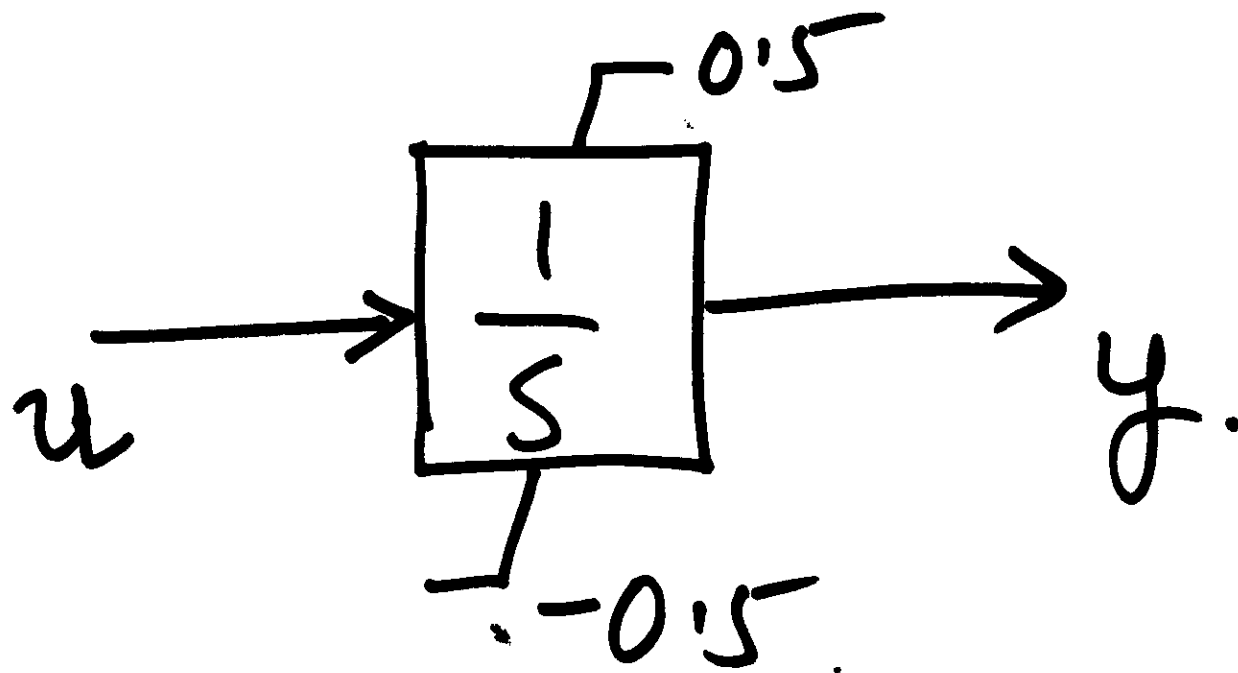




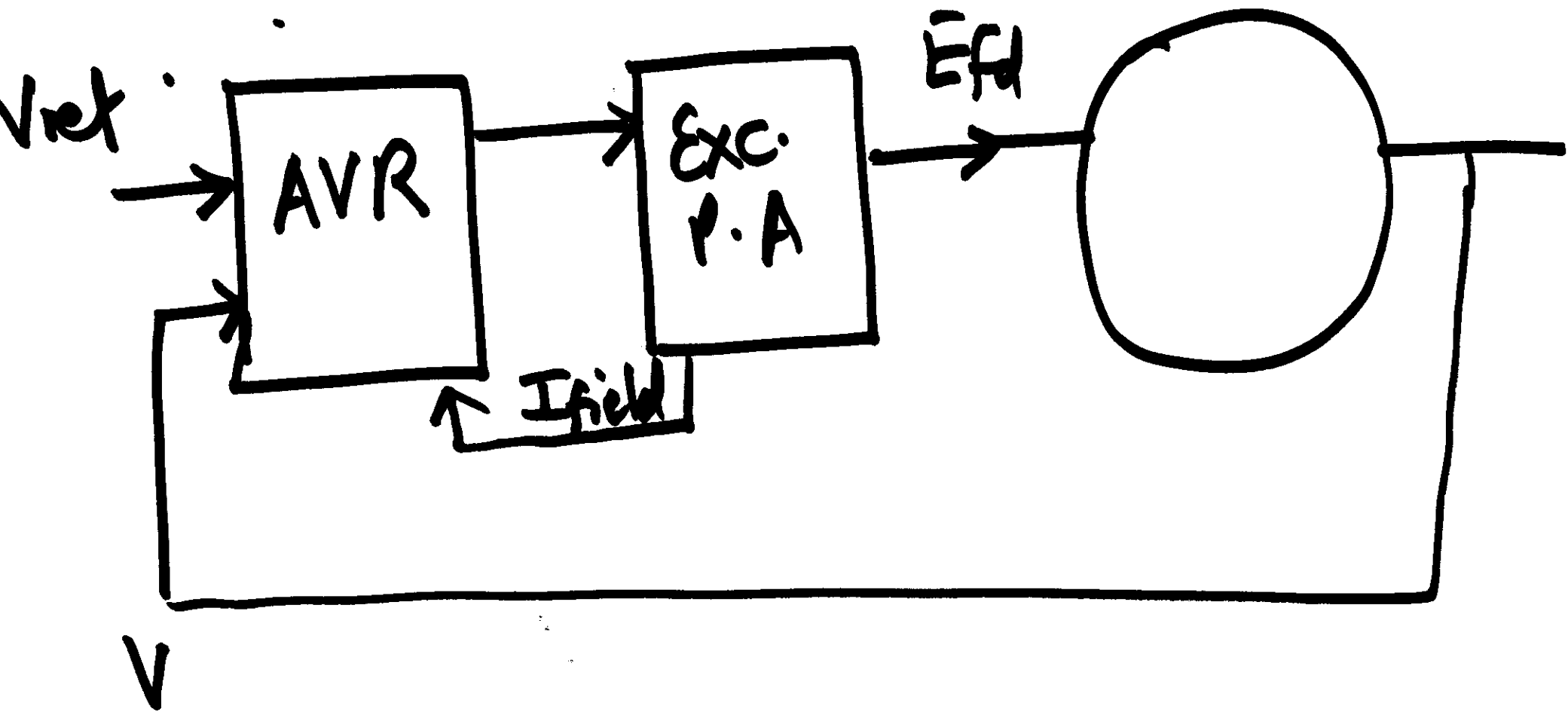


$\omega_{cut}$









$$T_A = 0.02 \text{ s.}$$

