

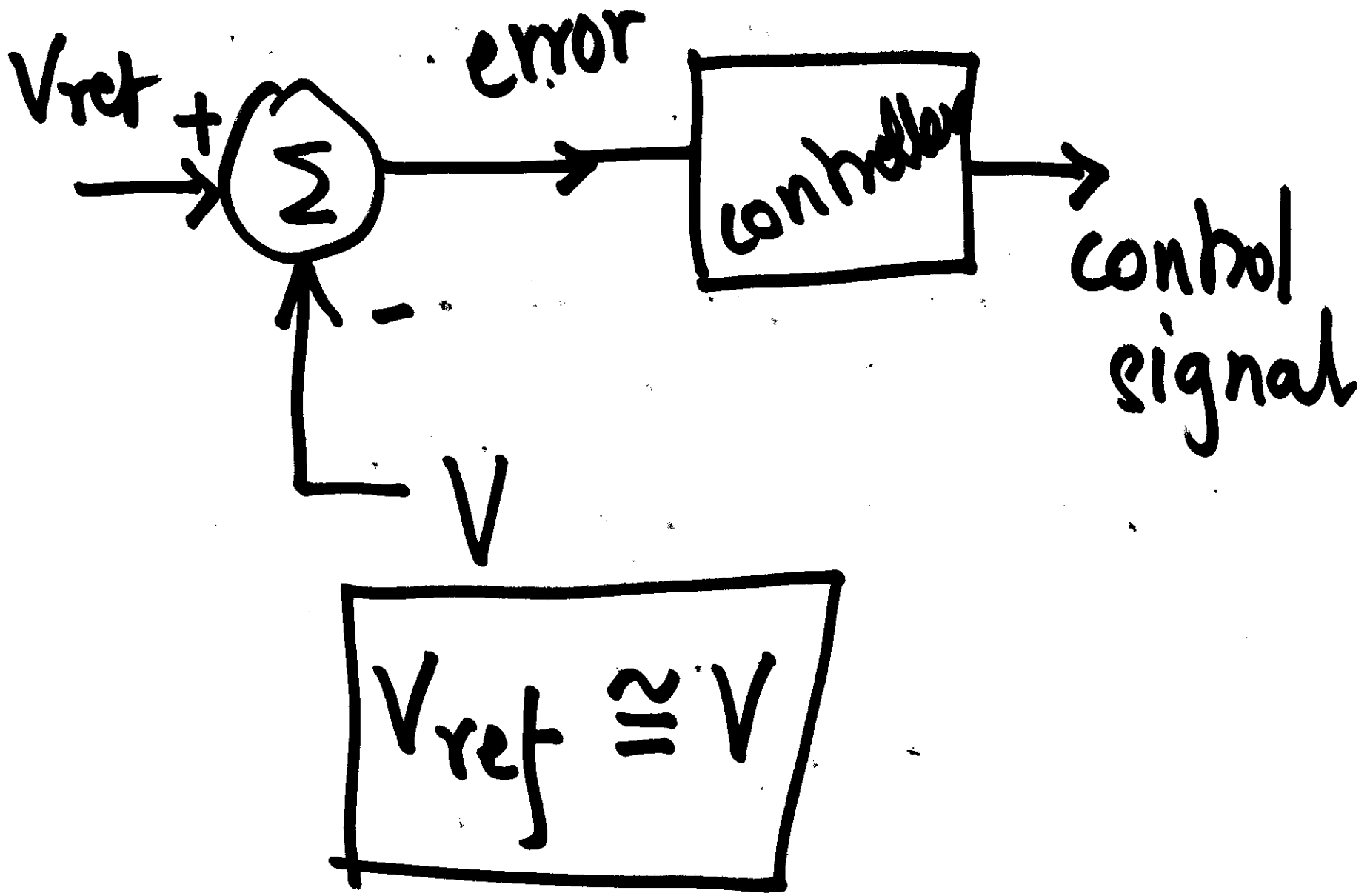
0.98

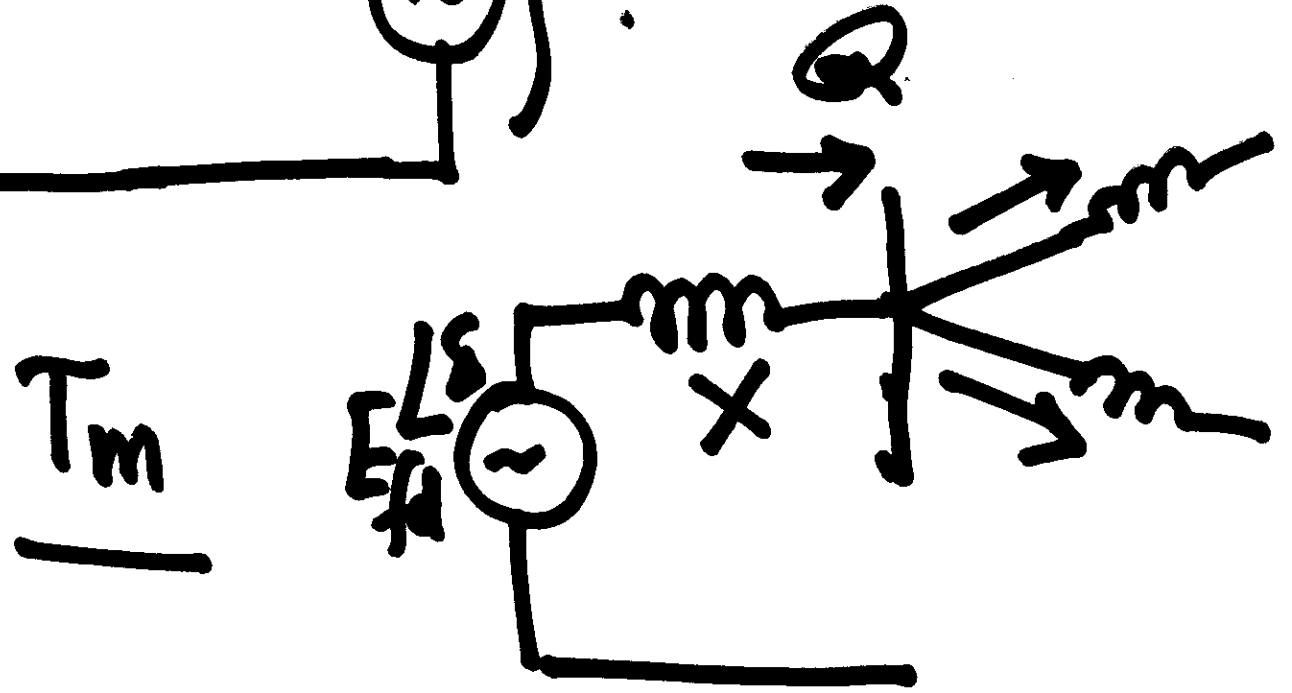
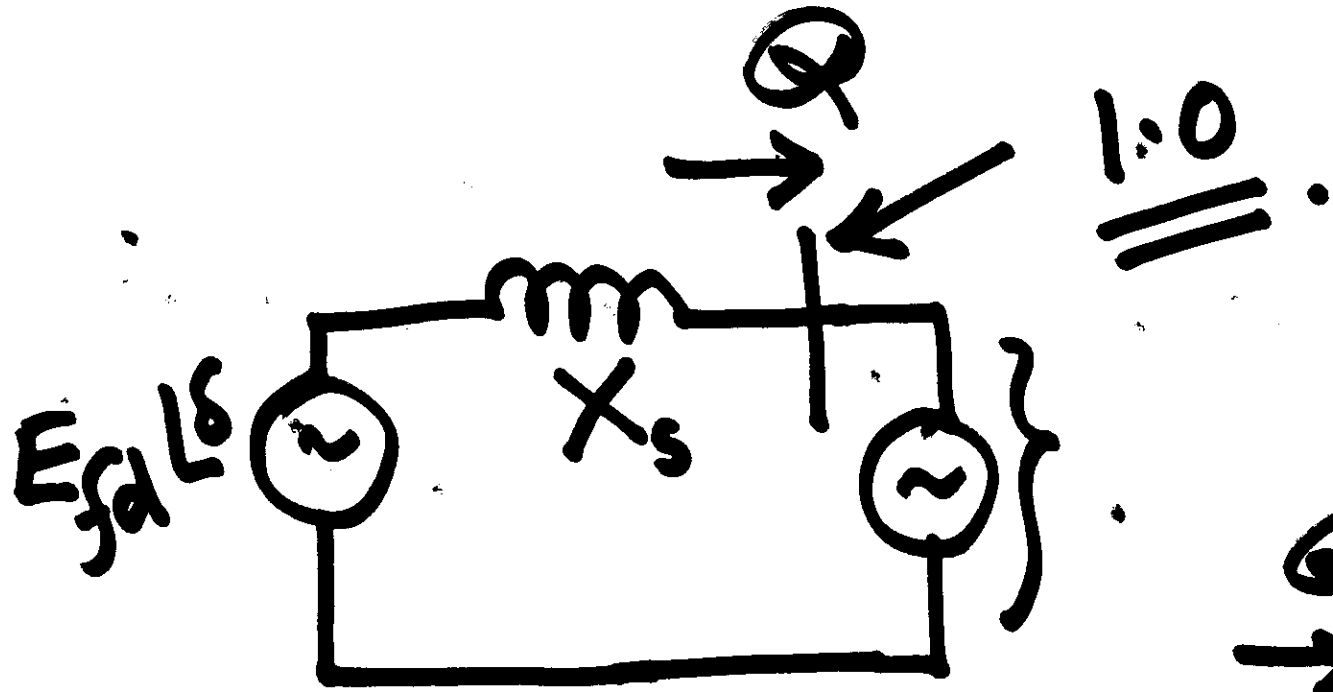
1.02

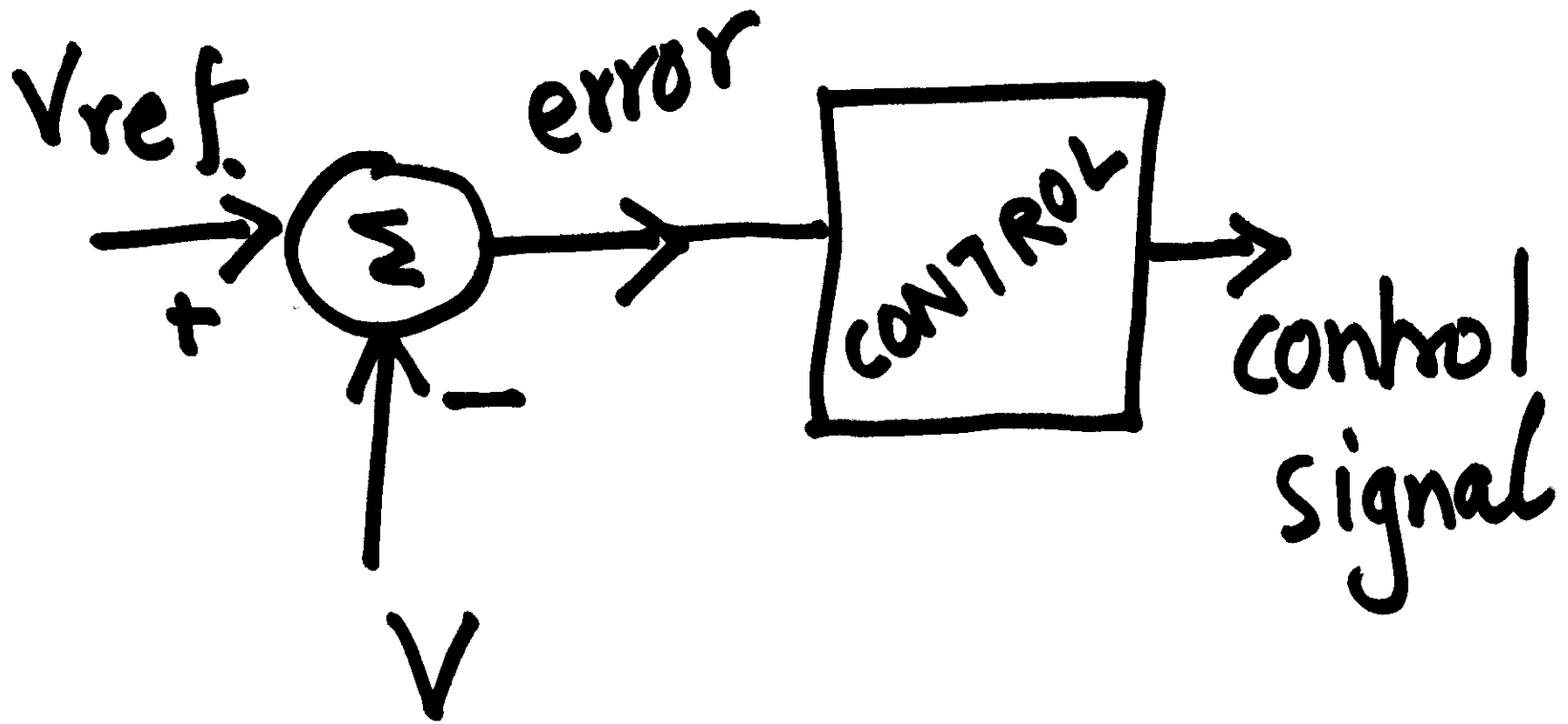
1.03

$$B \propto V/f$$

1.5

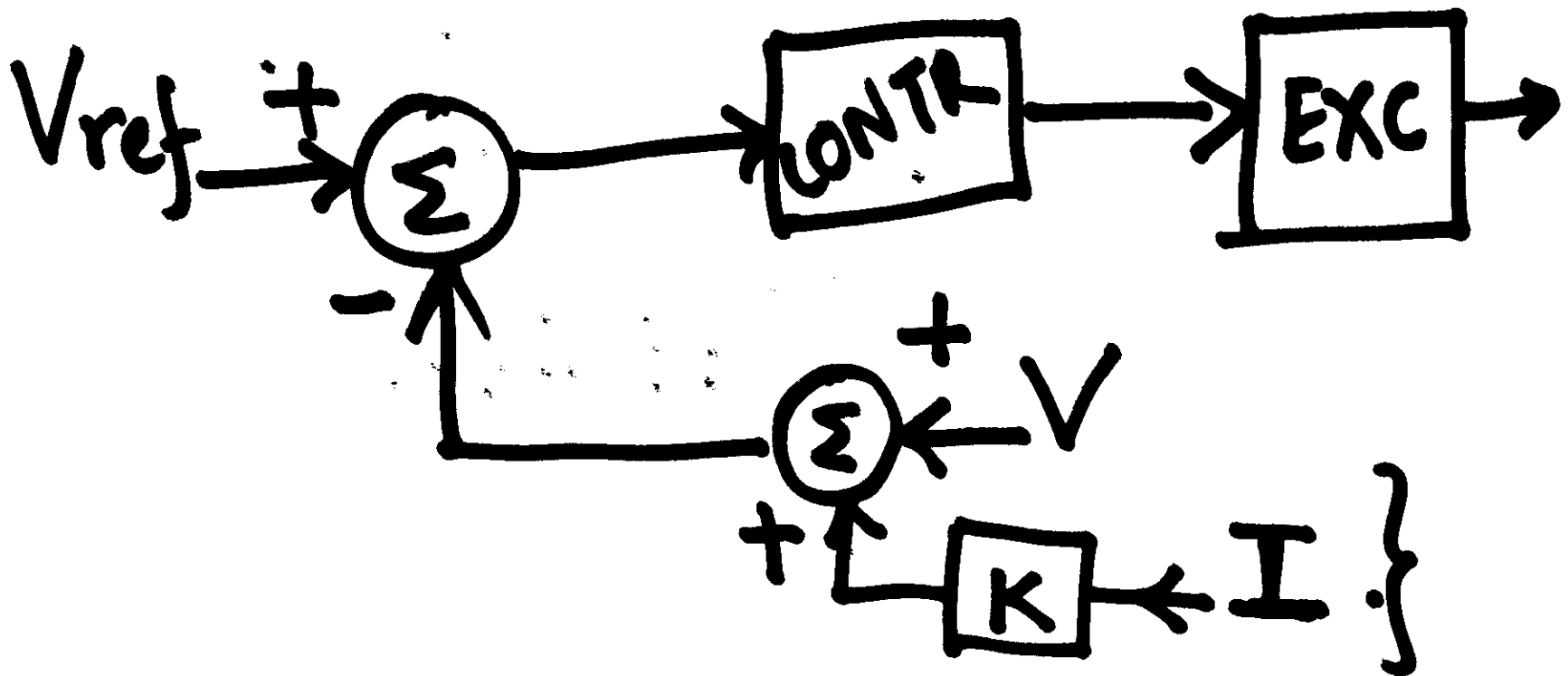


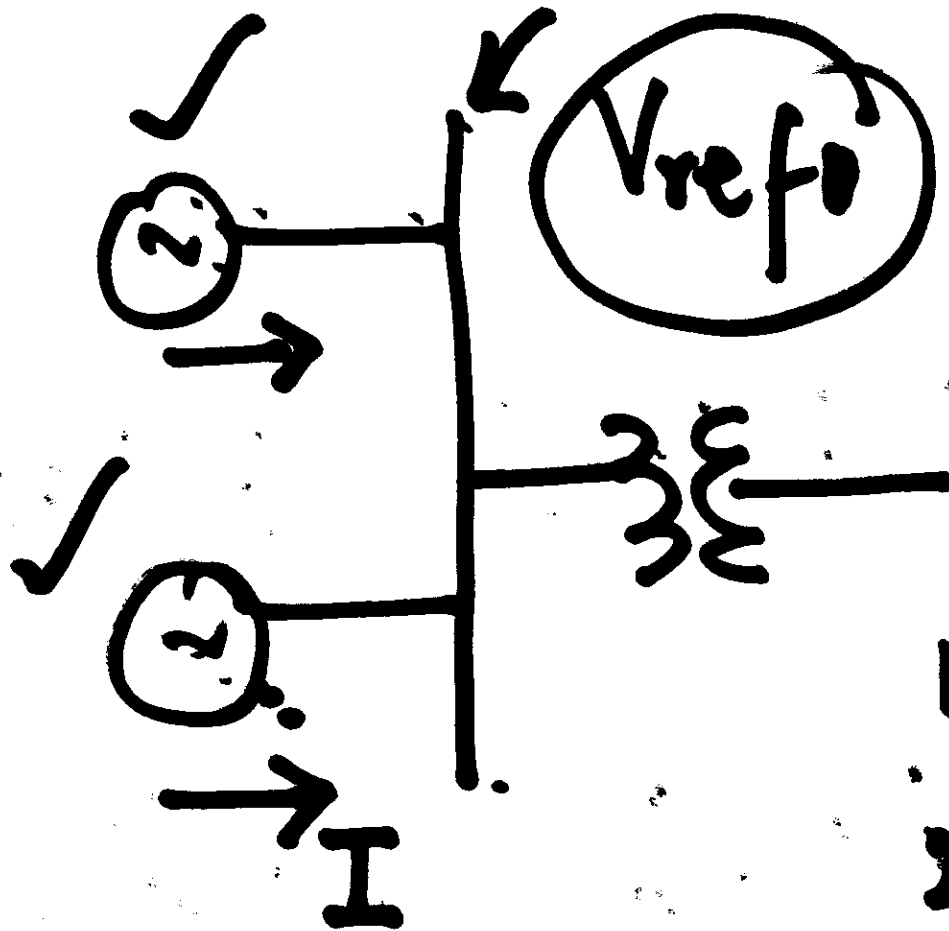




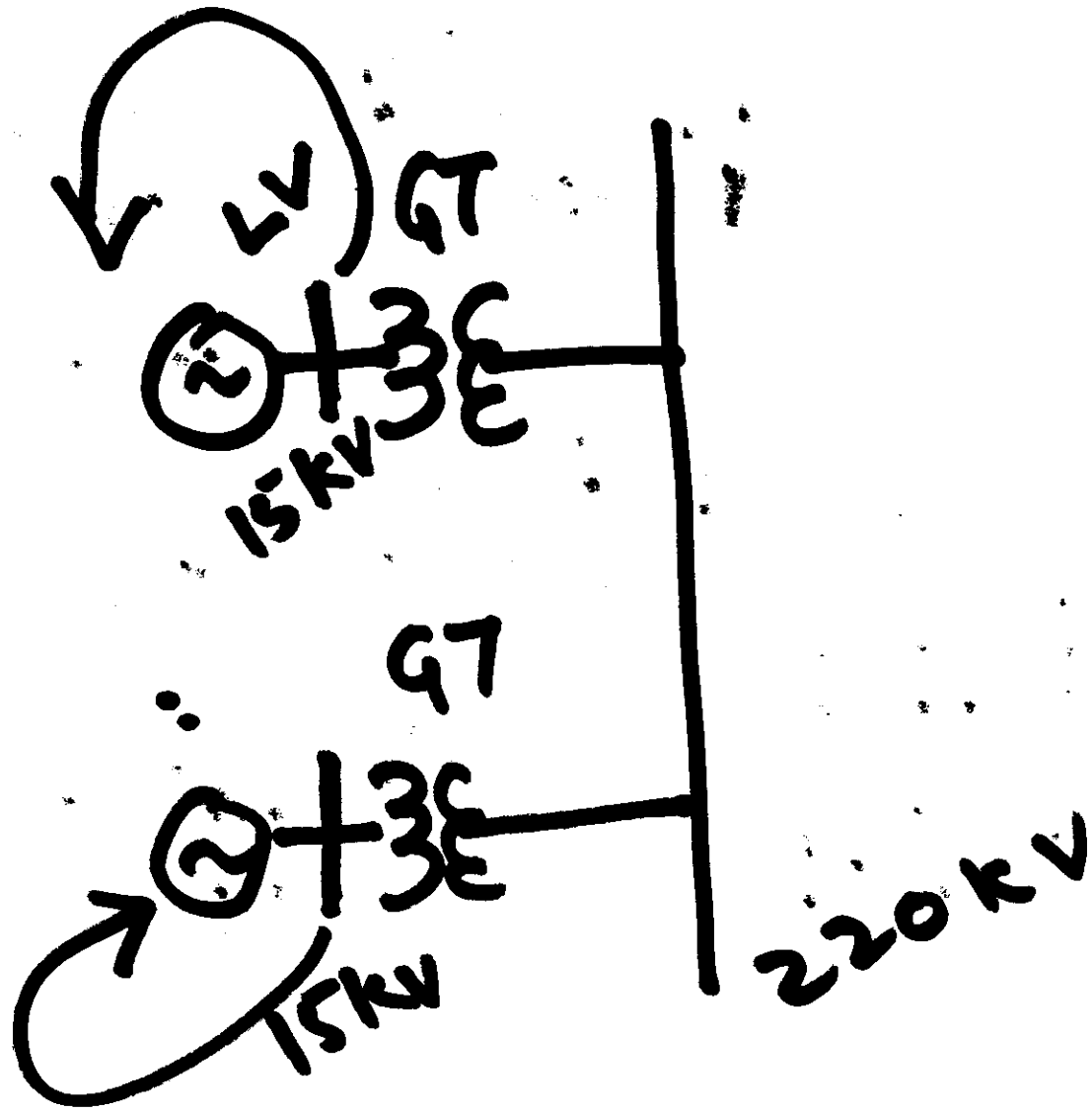
$$\underline{V_{ref} = 1.0}$$

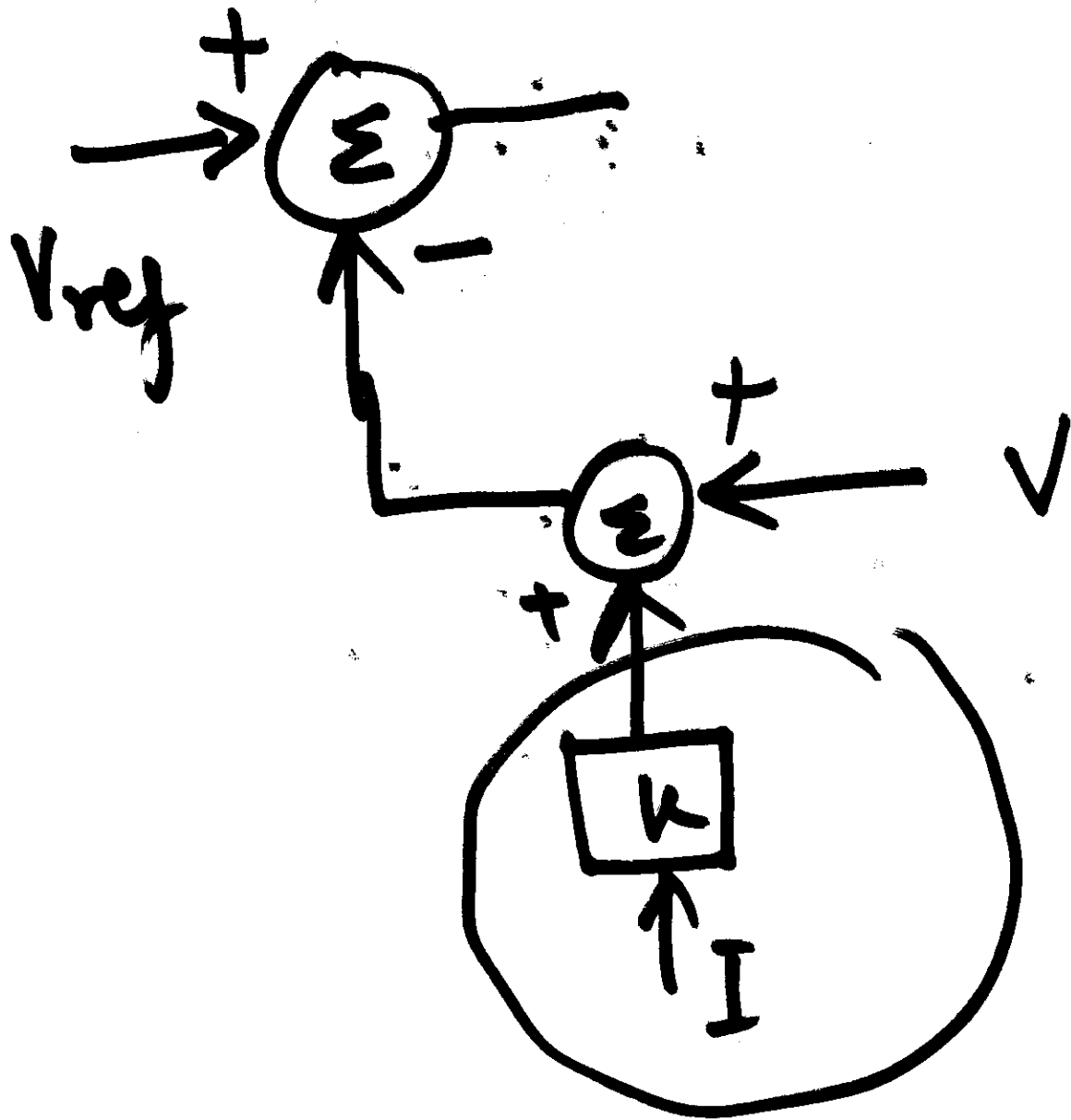
$$V_{ref} \approx V + KI$$





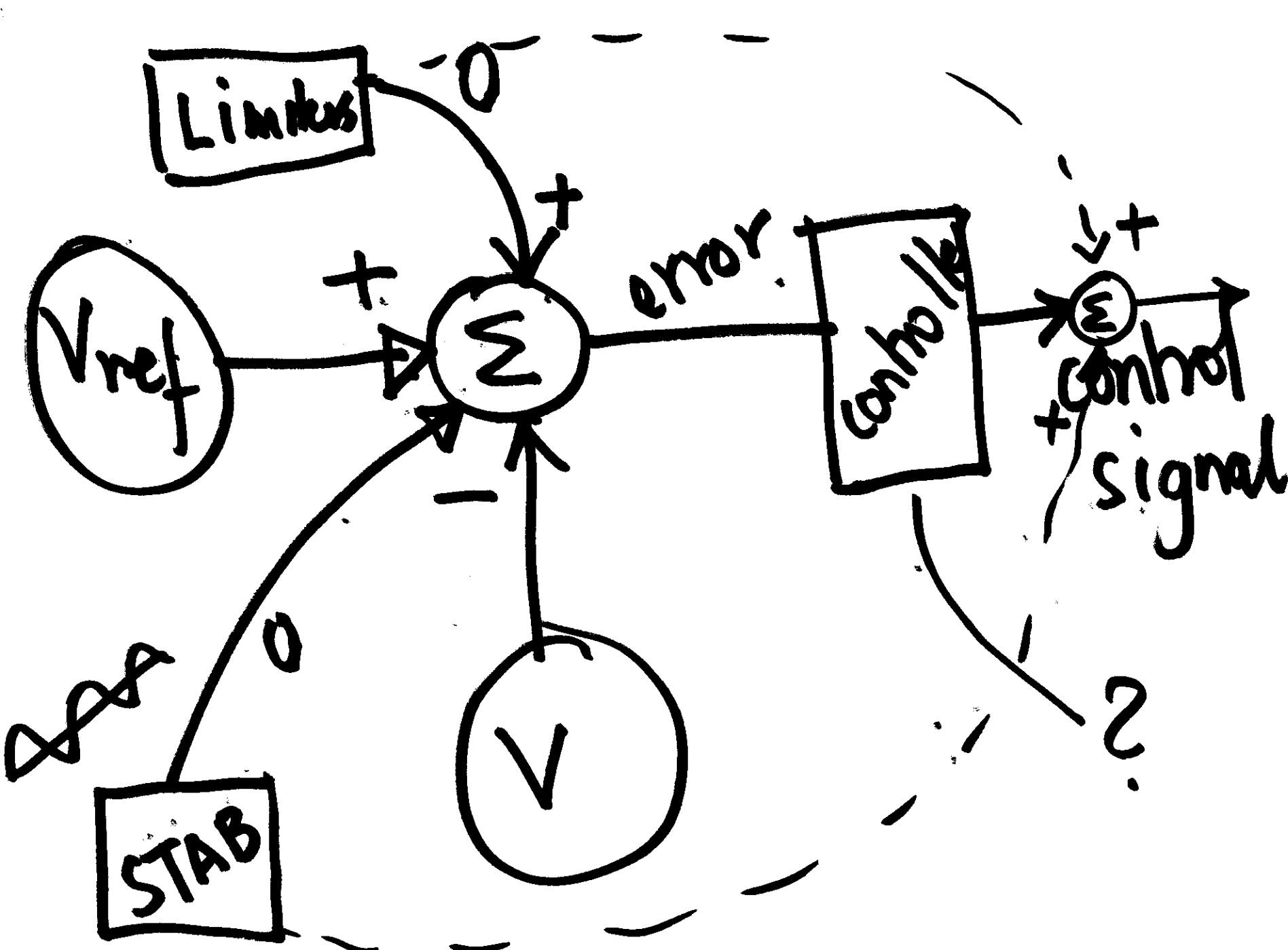
1. 2 identical
2. V_{ref}





$$V_{ref} = 1.05$$

$$f \downarrow 50 \text{ Hz.}$$



V_{ref}



$$V_{ref} = V + 0.05$$
$$V_{ref} - V = 0.05 = 0$$

$$\frac{U(s)}{7} = Y(s)$$

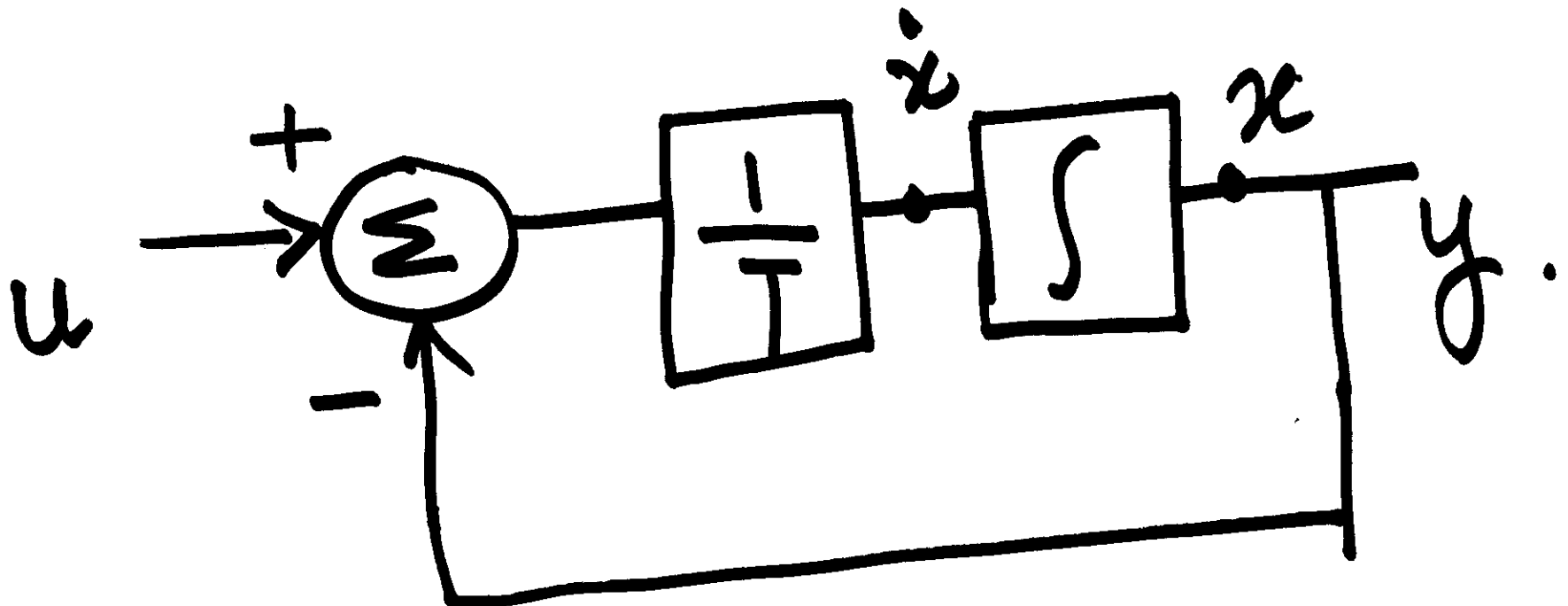
$$= \cancel{Y}$$

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

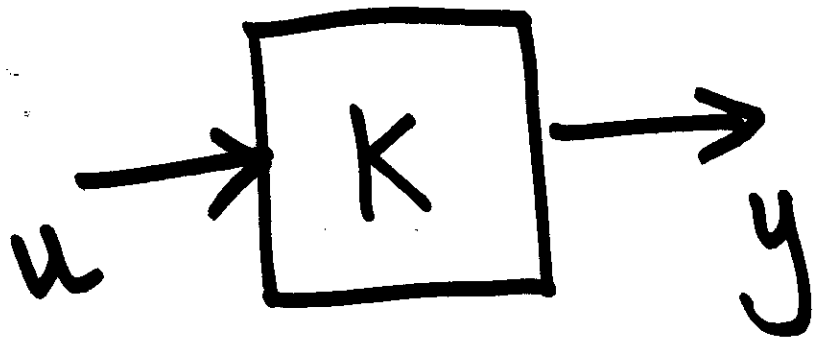
$$y = \frac{1}{T}x$$

$$sX(s) = -\frac{1}{T}X(s) + U(s)$$

$$Y(s) = \frac{1}{T}X(s)$$



block



's'
'1/s'

$$sX(s) = -\frac{1}{T}X(s) + \frac{1}{T}U(s)$$

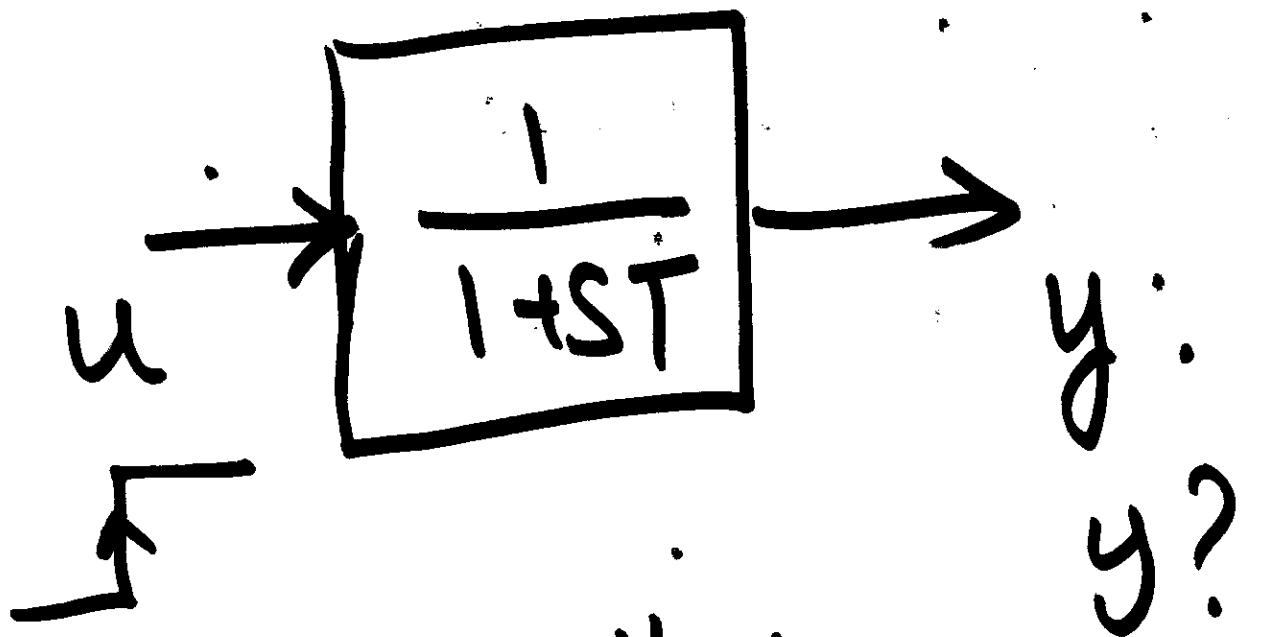
$$Y(s) = X(s)$$

$$(1+sT)X(s) = U(s)$$

$$Y(s) = \left(\frac{1}{1+sT}\right)U(s)$$



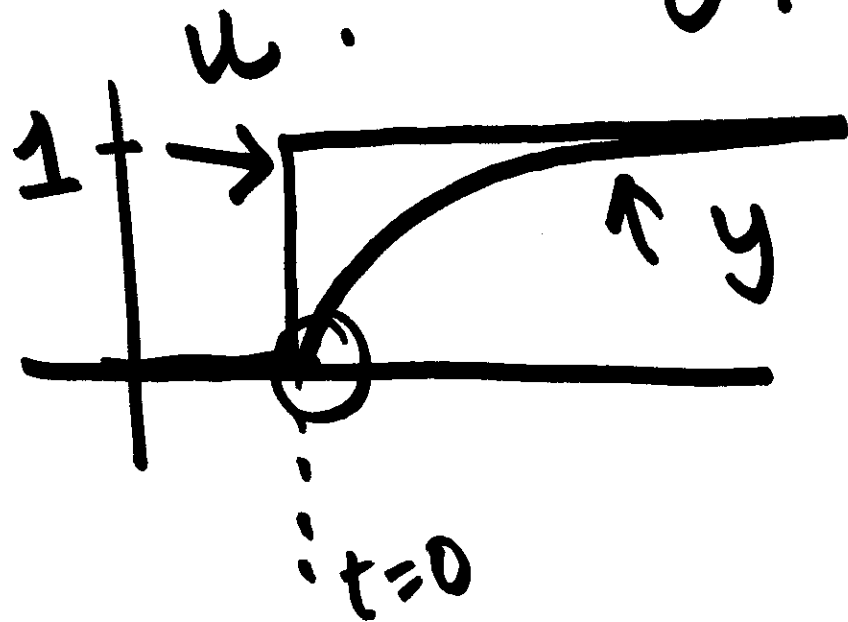
$$Y(s) = \frac{1}{1+sT} U(s)$$



steady state ✓

'1'

's=0'



$$y = 1 - e^{-t/T}$$

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

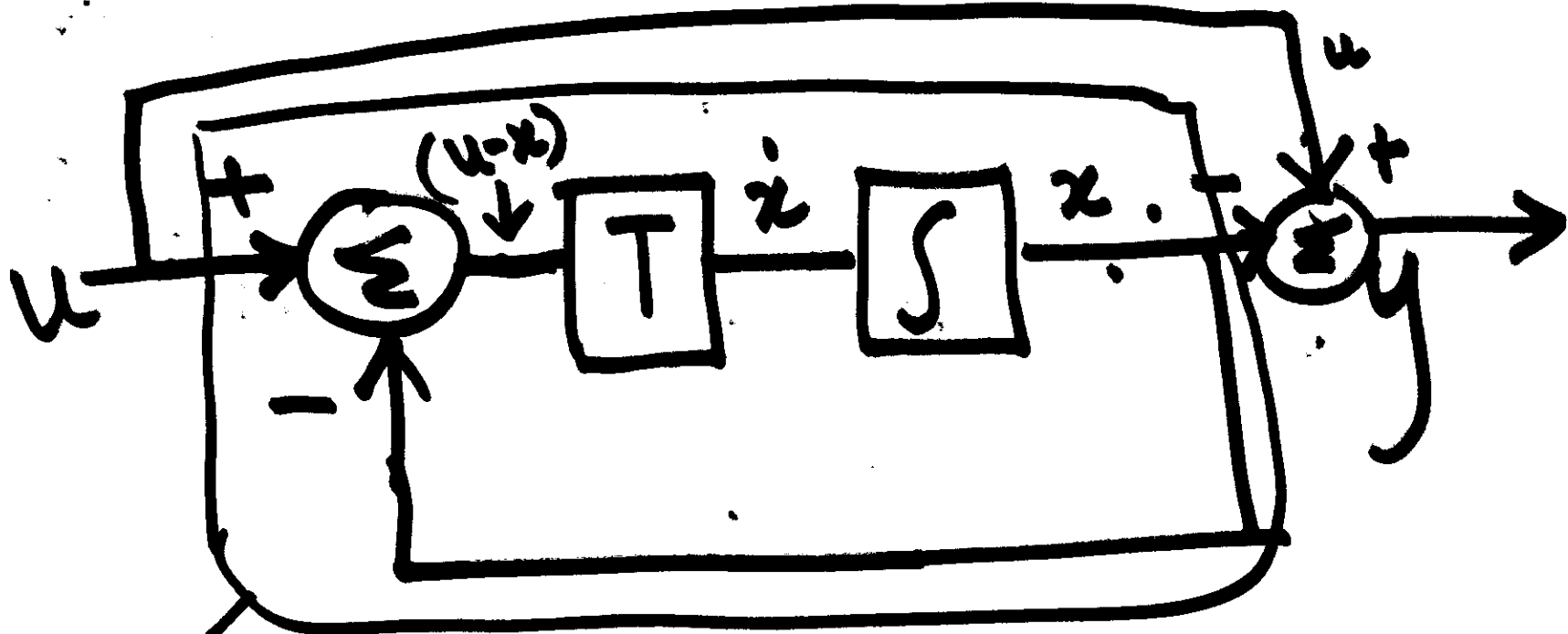
$$s = j\omega$$

$$\frac{Y(j\omega)}{U(j\omega)} = \left(\frac{1}{1+j\omega T} \right)$$

-ve shift

$$1 \leftarrow \omega=0 \rightarrow 0^\circ$$

$$0 \leftarrow T\omega \gg 1 \rightarrow -90^\circ$$

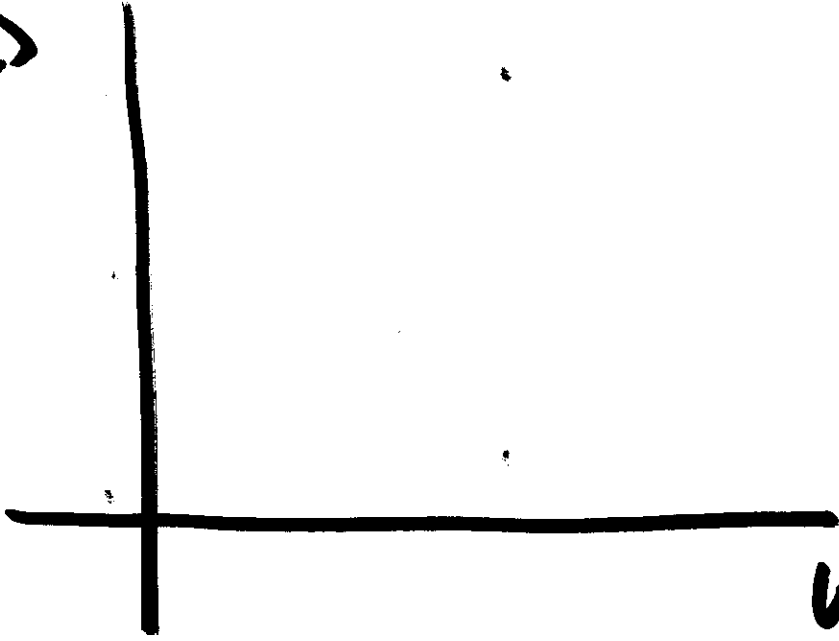


$$\frac{1}{1+ST}$$

$$\int \rightarrow \frac{1}{s}$$

$$\frac{ST}{1+ST} = 1 - \frac{1}{1+ST}$$

$\frac{Y}{U}$



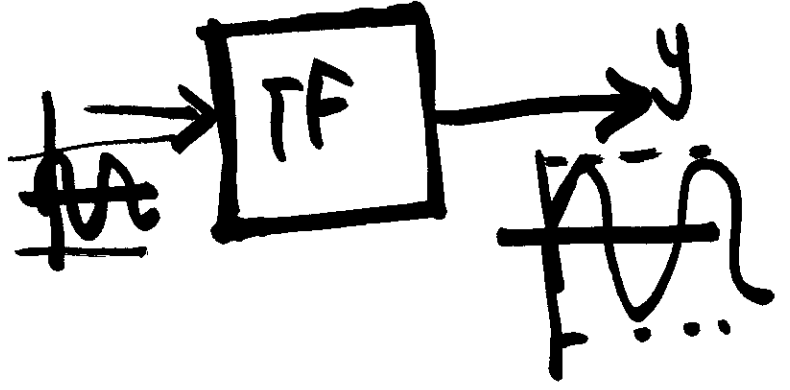
ω

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



1

LOW



$$(1+sT)X(s) = T U(s)$$

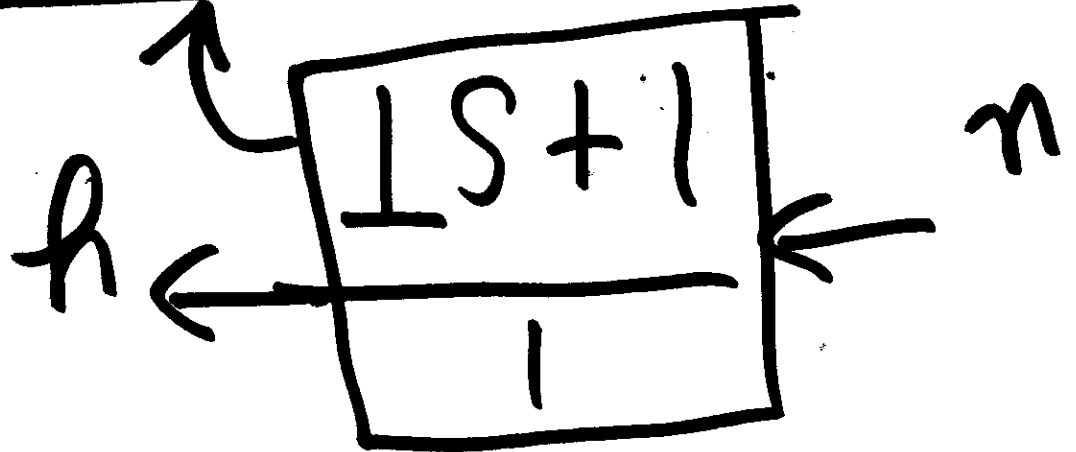
$$Y(s) = \frac{1}{T} U(s)$$

$$Y(s) = \frac{1}{1+sT} U(s)$$

$$\left\{ \frac{(1+sT)}{T} \right\} X(s) = U(s)$$

$$x \neq = h$$

$$n \frac{1}{1} + x \frac{1}{1} = \frac{dp}{dx}$$



Washout

$$\tilde{y} = u - x$$

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

