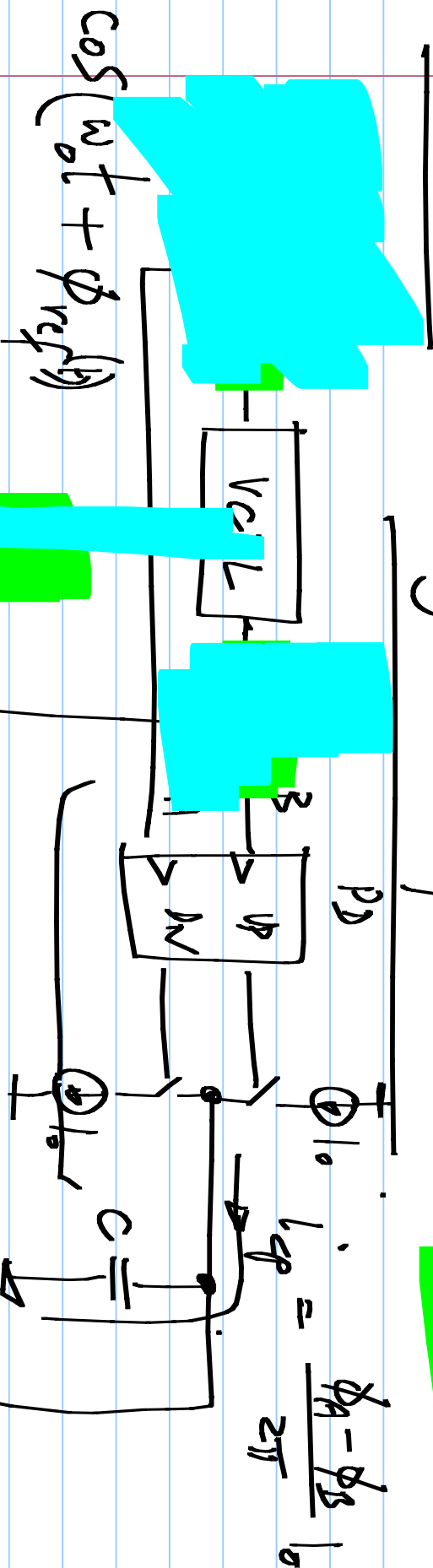


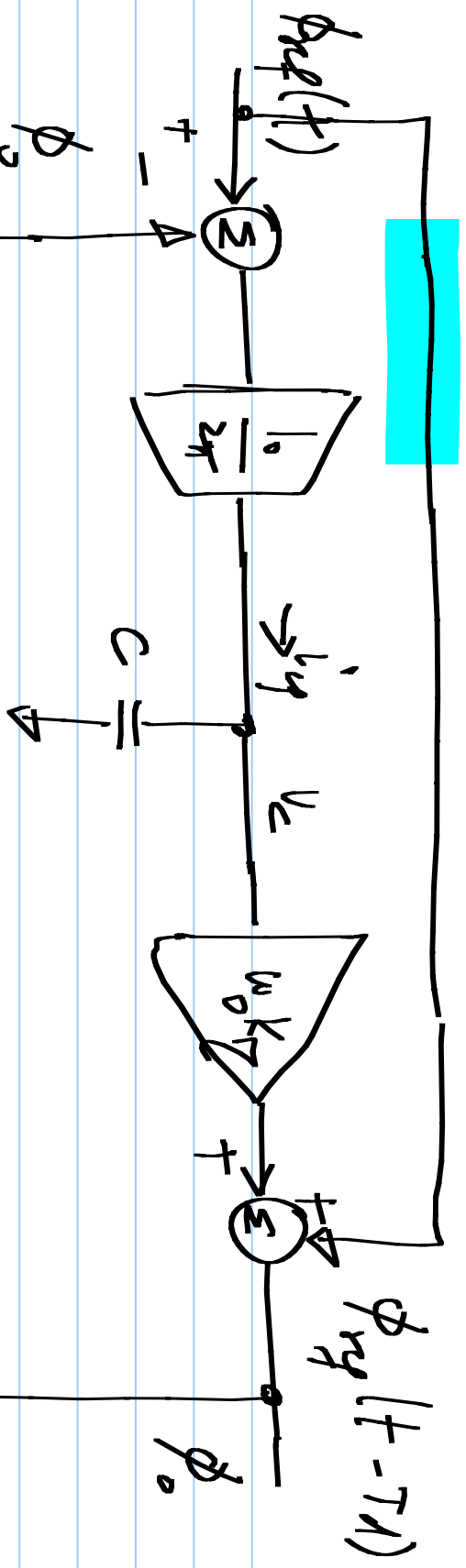
Lecture 25

Delay-locked loop model



$$\cos(\omega_0(t)) + \dots + V_c$$

~~$T_d - \omega_0 k_T \phi_{op}$~~



op. point Incremented.

in: $\omega_0 t + \phi_{ref}$

$\omega_0 t + \phi_{ref} +$

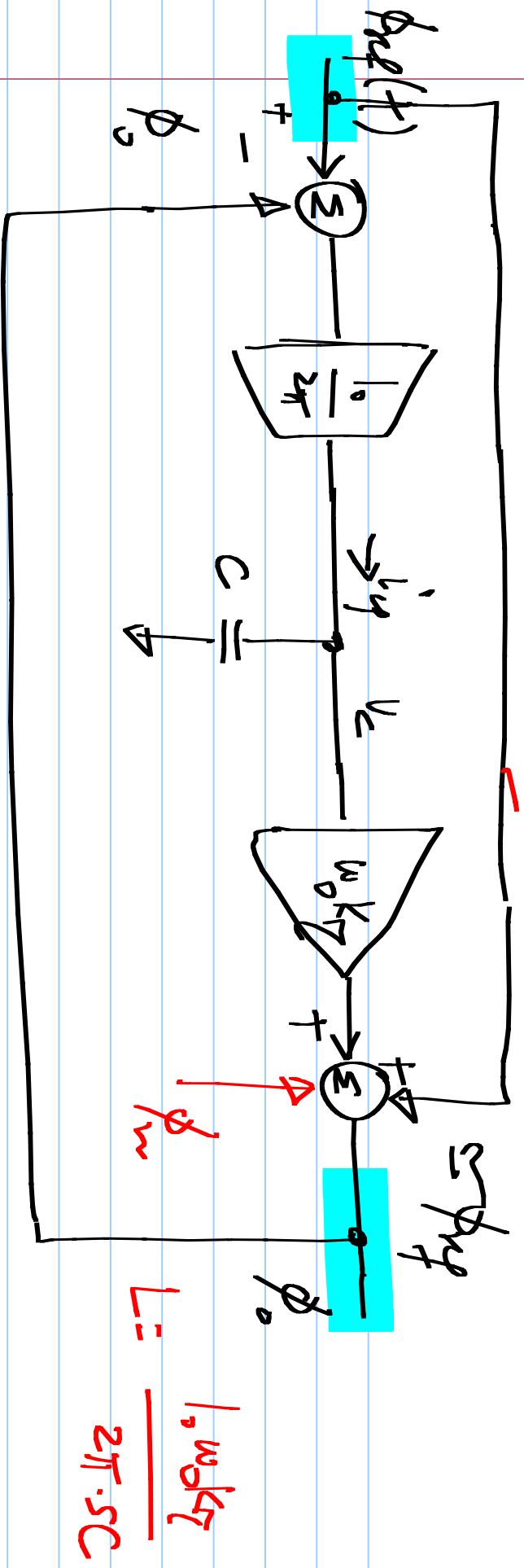
out: $\omega_0 t + \phi_{ref} - \omega_0 T_{d,op}$

$\omega_0 t + \phi_{ref} - \omega_0 T_{d,op} +$

$\phi_{ref}(t - T_d) +$

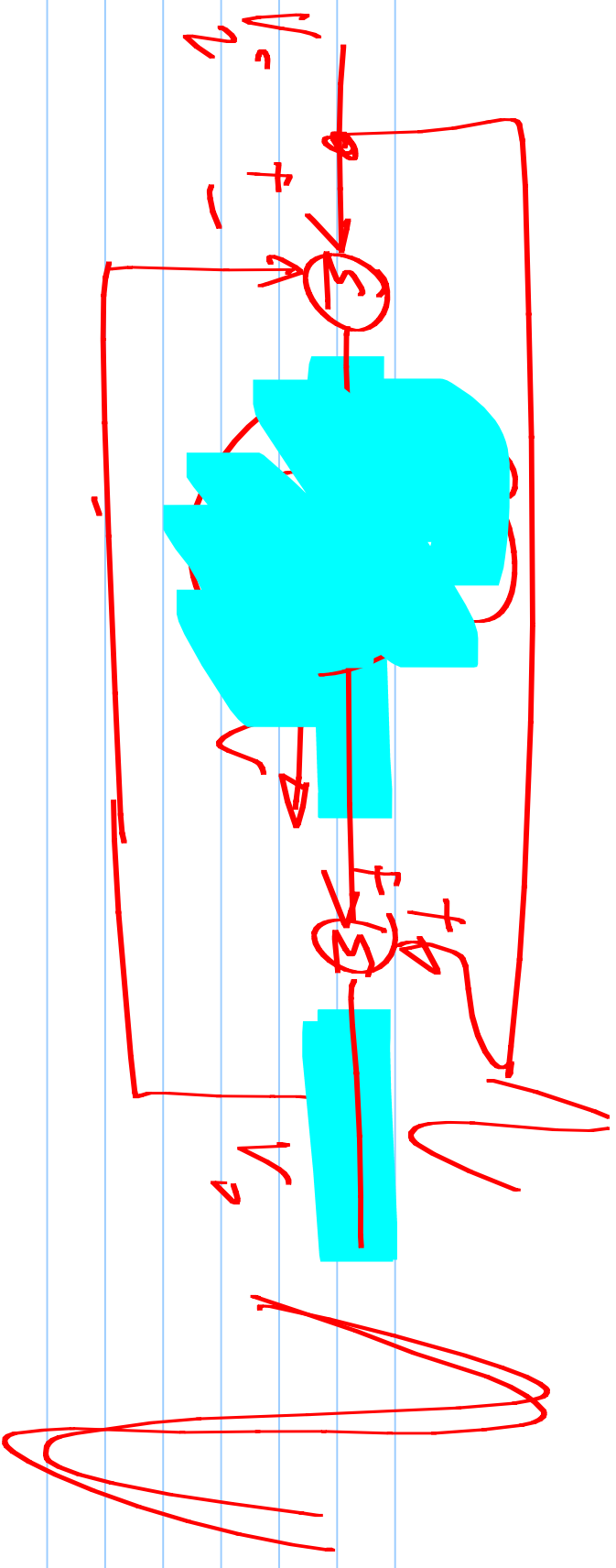
$\omega_0 k_T \cdot V_c$

only the increments

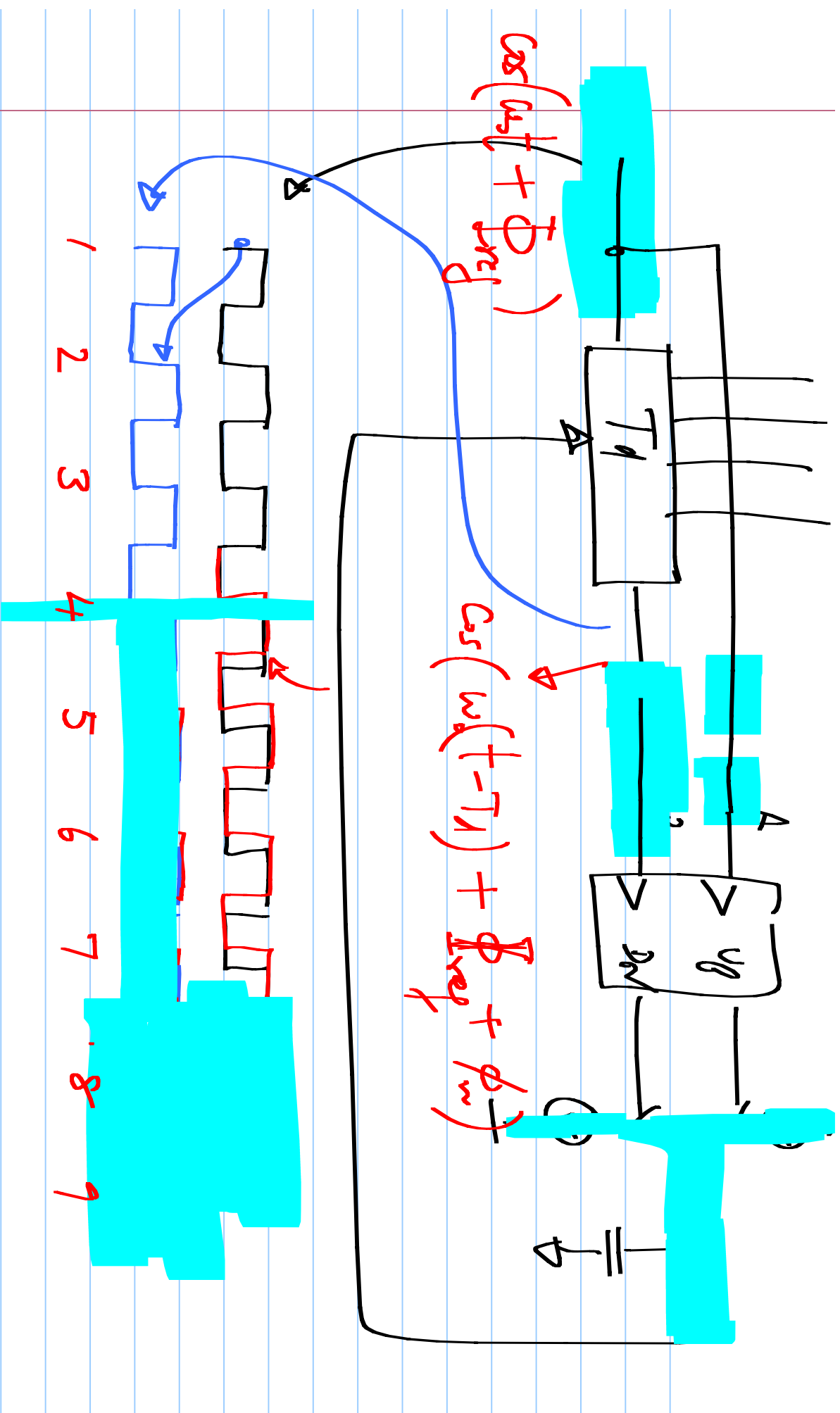


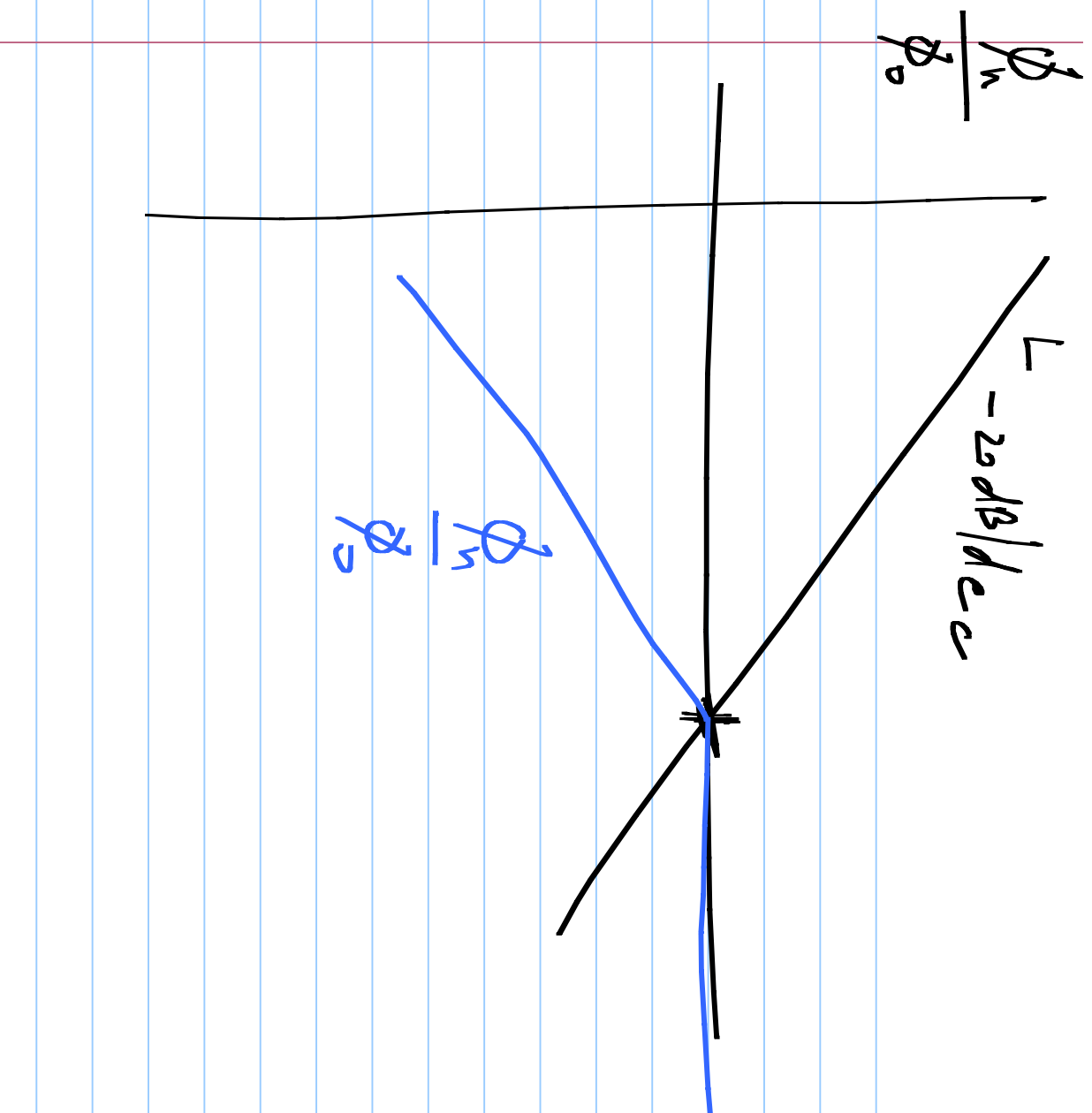
Transfer fn. = 1 because of input feed forward

$$\frac{\phi_o}{\phi_w} = \frac{1}{1+L} = \frac{s/p_1}{1+s/p_1} \quad p_1 = \left(\frac{1 \cdot w_o k_T}{2\pi C} \right) \text{ rad/s}$$



$$\frac{L}{1+L}$$





1st order fit
loop
No stability
concern