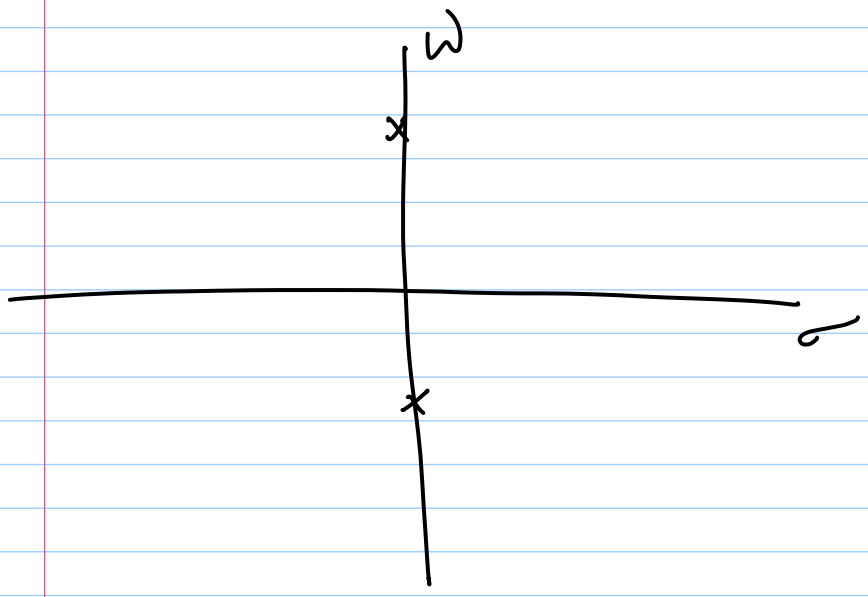
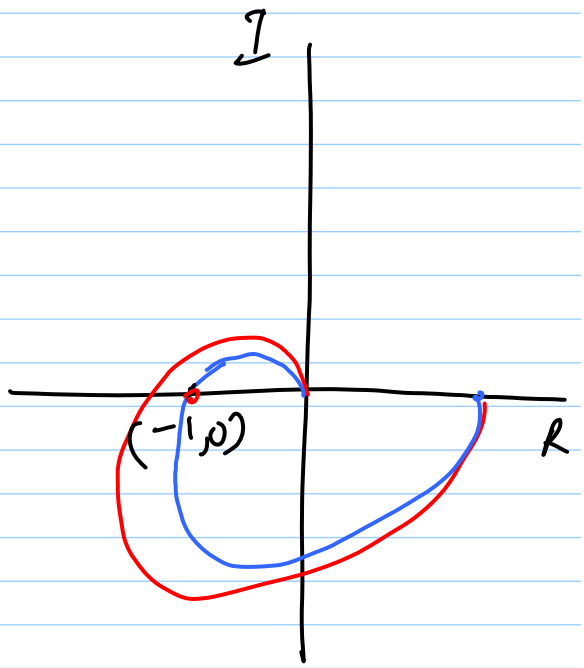
15-2-13

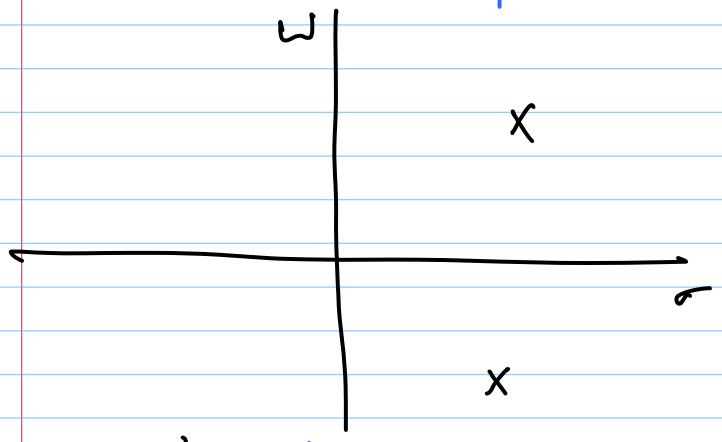
Lec 21

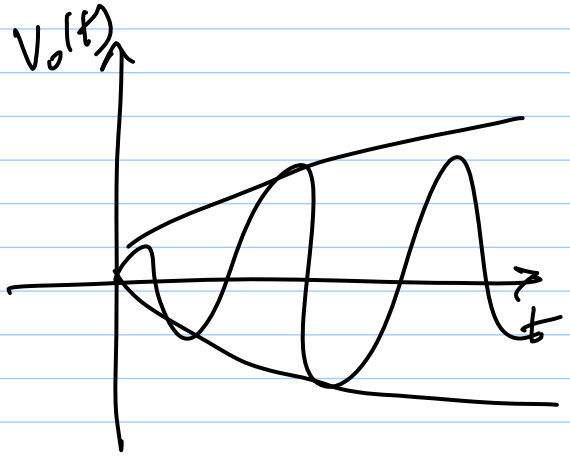
$1+L(s)=0$ @ ω_0

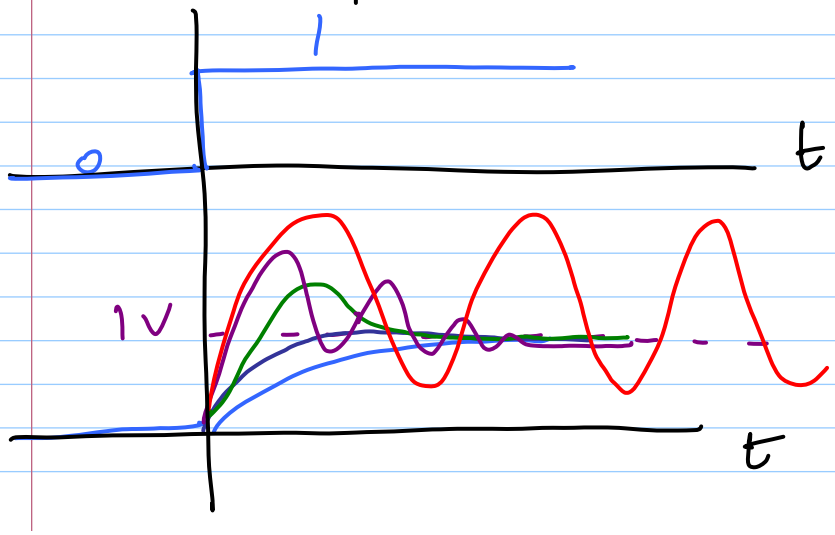




roots are complex: $\sigma \pm j\omega$

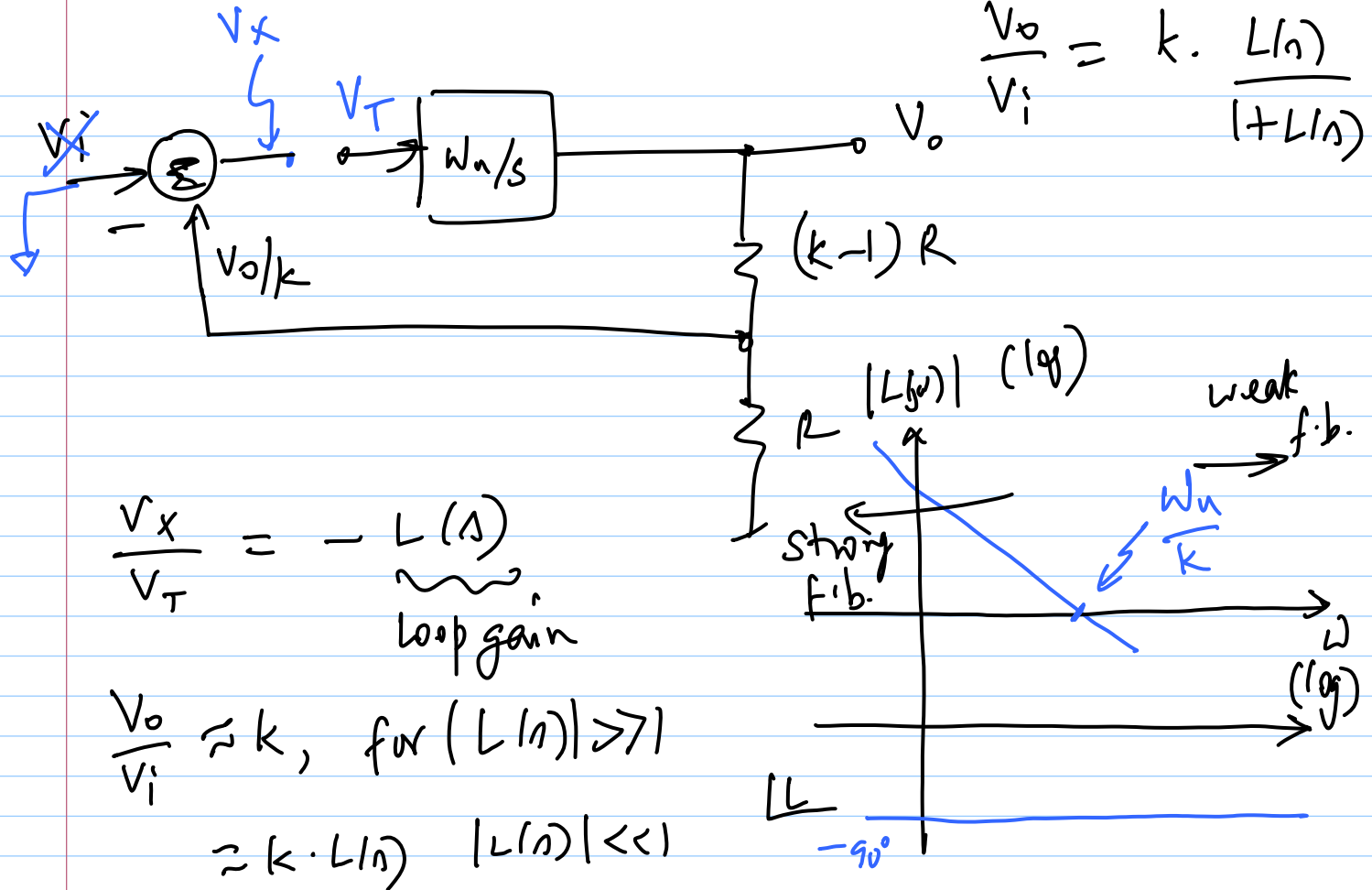


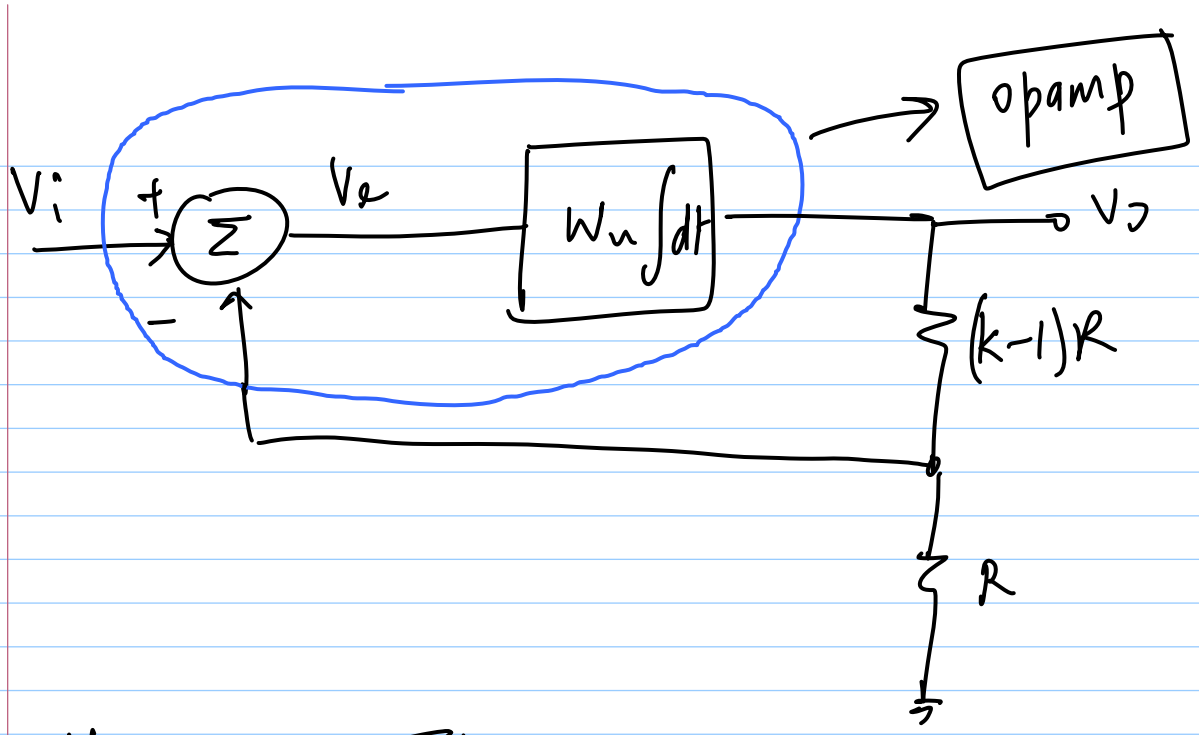


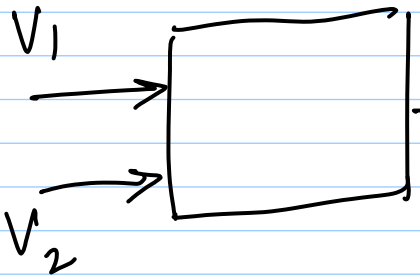


Assignment

Order	$L(s)$	Unstable?	Phase margin
1	$\frac{\omega_u}{s}$	No	$90°$
2.	$\frac{\omega_u}{s} \cdot \frac{1}{(1+s/p_2)}$	stable for certain values of ζ, $p_2 \leftrightarrow \omega_u$	
3)	$\frac{\omega_u}{s} \cdot \frac{1}{(1+s/p_2)^2}$		
.	.	.	.
.	.	.	.
.	.	.	.

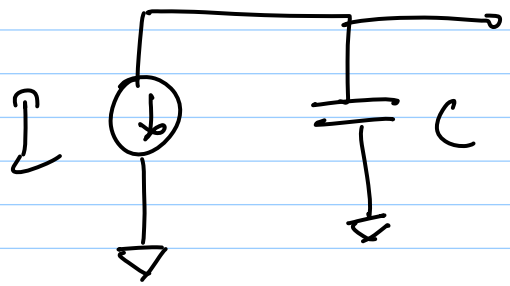




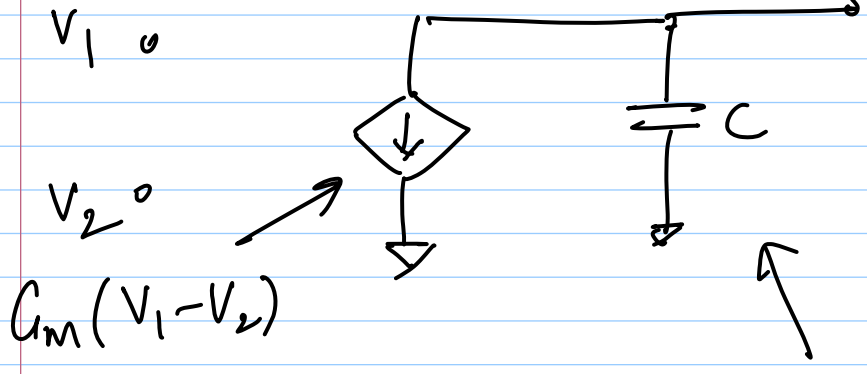


$$V_o = W_u \int (V_1 - V_2)\,dt$$

* Capacitors perform integration

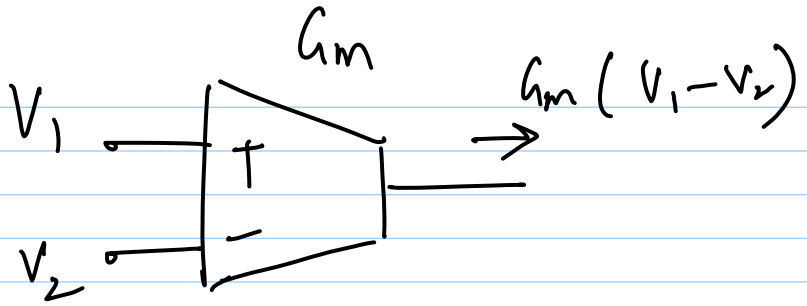


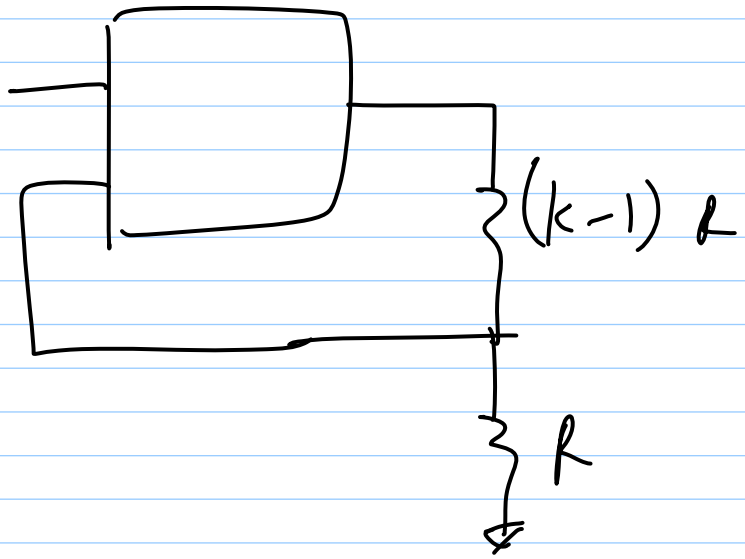
$$V = \frac{1}{C} \int I\,dt$$

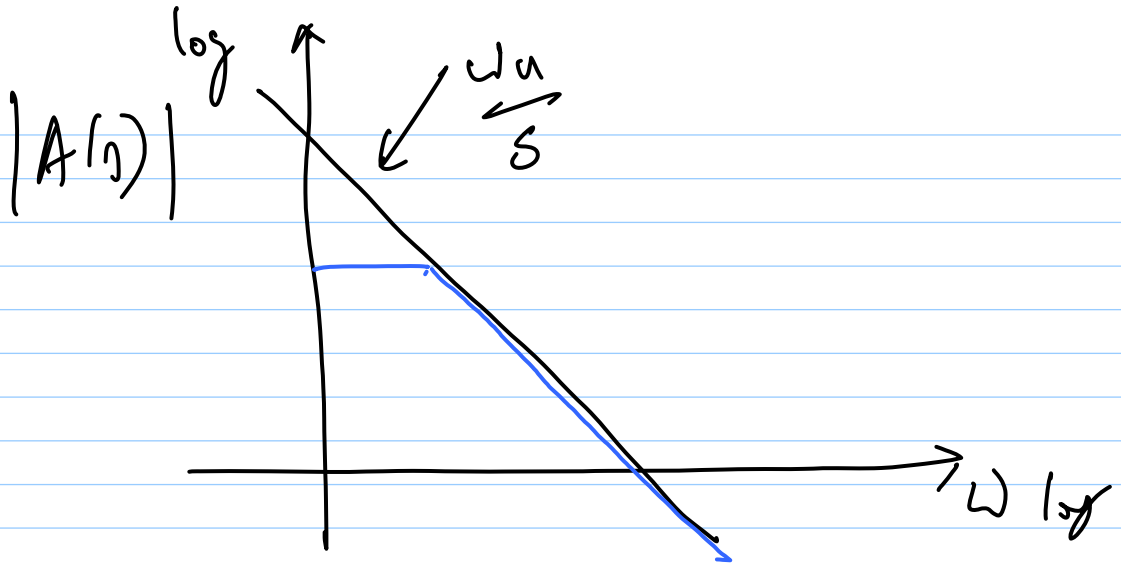


$$V_c = \frac{G_m}{C} \int (V_1 - V_2)\,dt$$

$$W_u = \frac{G_m}{C}$$


Gm
V_1
V_2
+
−
$G_m(V_1 - V_2)$


$(k-1)R$
R


log
$|A(j\omega)|$
ω_u
ω log