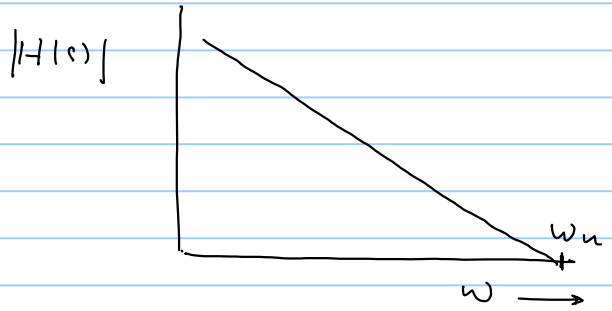
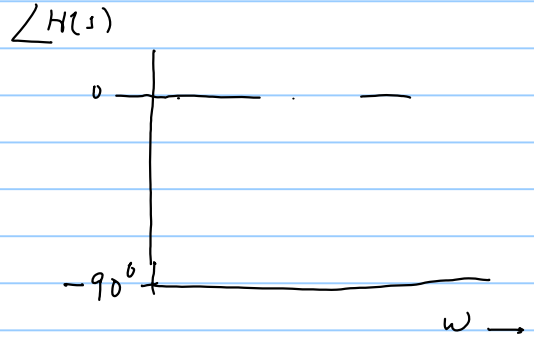
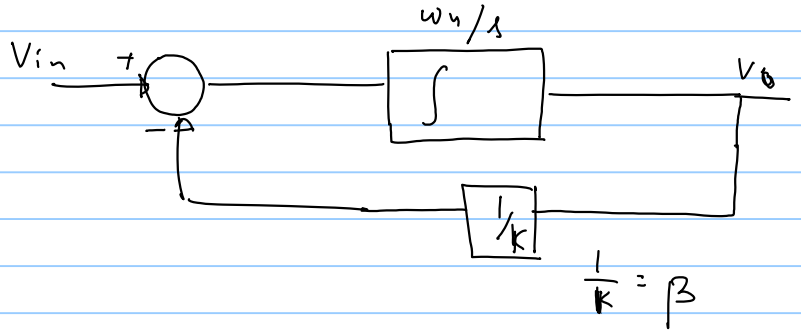
EE2019

Note Title 1/24/2020

$$H(s) = \frac{V_o}{V_{in}} = \frac{\omega_n}{s}$$ integrator





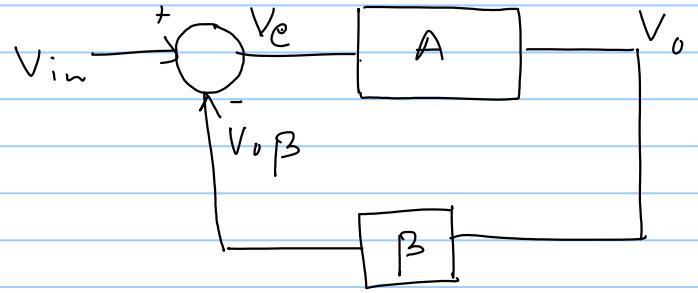


$\frac{1}{K} = \beta$

closed loop T.F.

$$\frac{V_o(s)}{V_{in}(s)} = \frac{1}{s/\omega_n + 1/K}$$

$S = 0, \quad \frac{V_0}{V_{in}} = K$

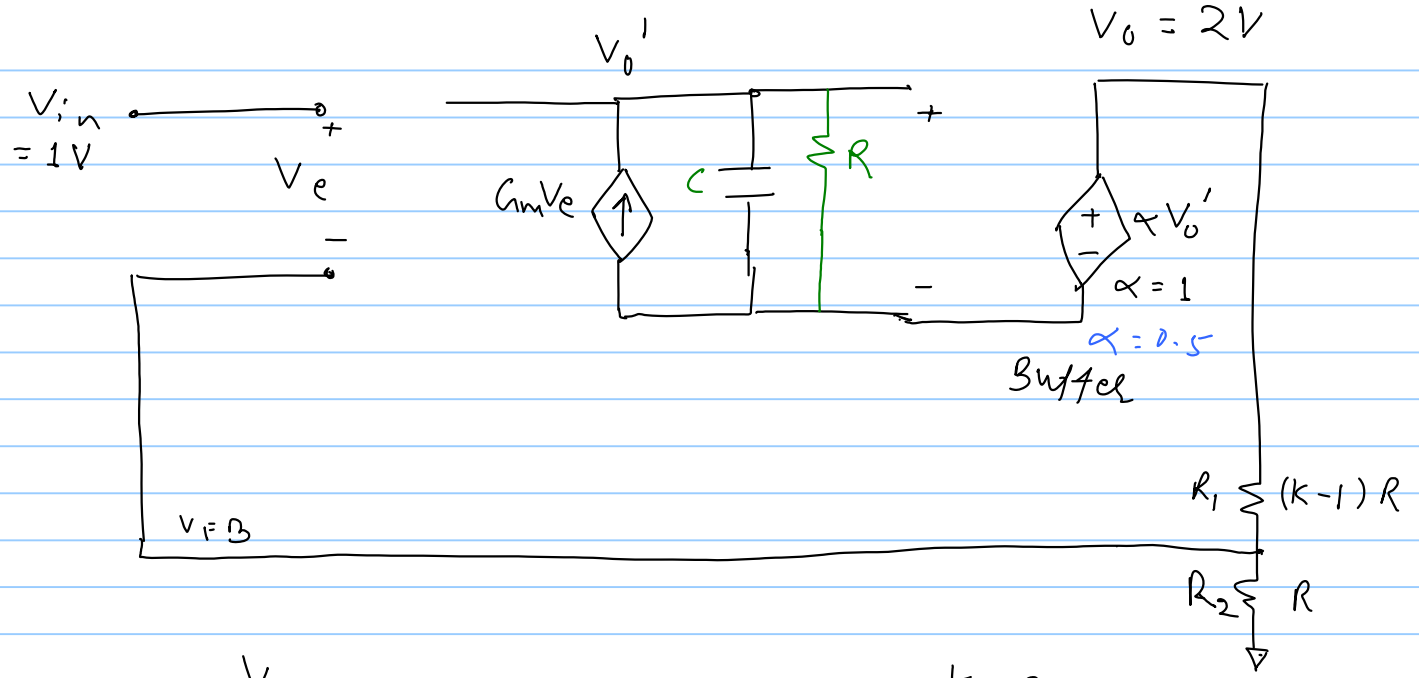


$$\frac{V_0(s)}{V_{in}(s)} = \frac{A}{1 + A\beta}$$

for $A\beta >> 1$

$$\frac{V_0}{V_{in}} = \frac{1}{\beta}$$

$A\beta \rightarrow$ loop gain



$K = 2$

$$\frac{V_o}{V_{in}} = K = 2$$

without R, $\boxed{\frac{V_o'}{V_e} = \frac{G_m}{C} \cdot \frac{1}{s}}$ Ideal

with R

$$\frac{\frac{1}{R}}{\frac{1}{R}+sC} \times G_m V_e = V_o'$$

$$\boxed{\frac{V_o'}{V_e} = \frac{G_m \cdot R}{1 + RCs}}$$ Real

$$\left.\frac{V_o'}{V_e}\right|_{s=0} = G_m R$$