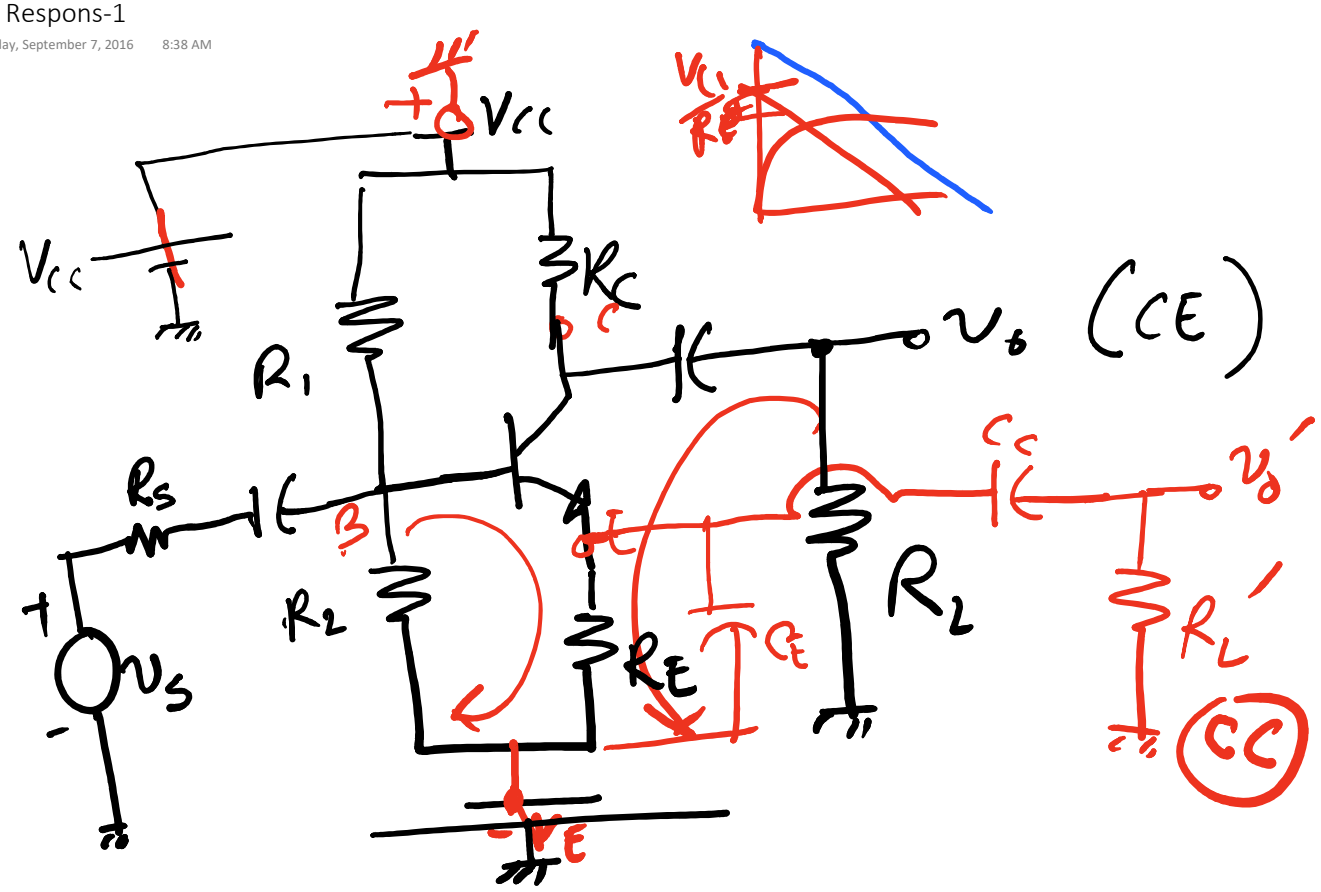
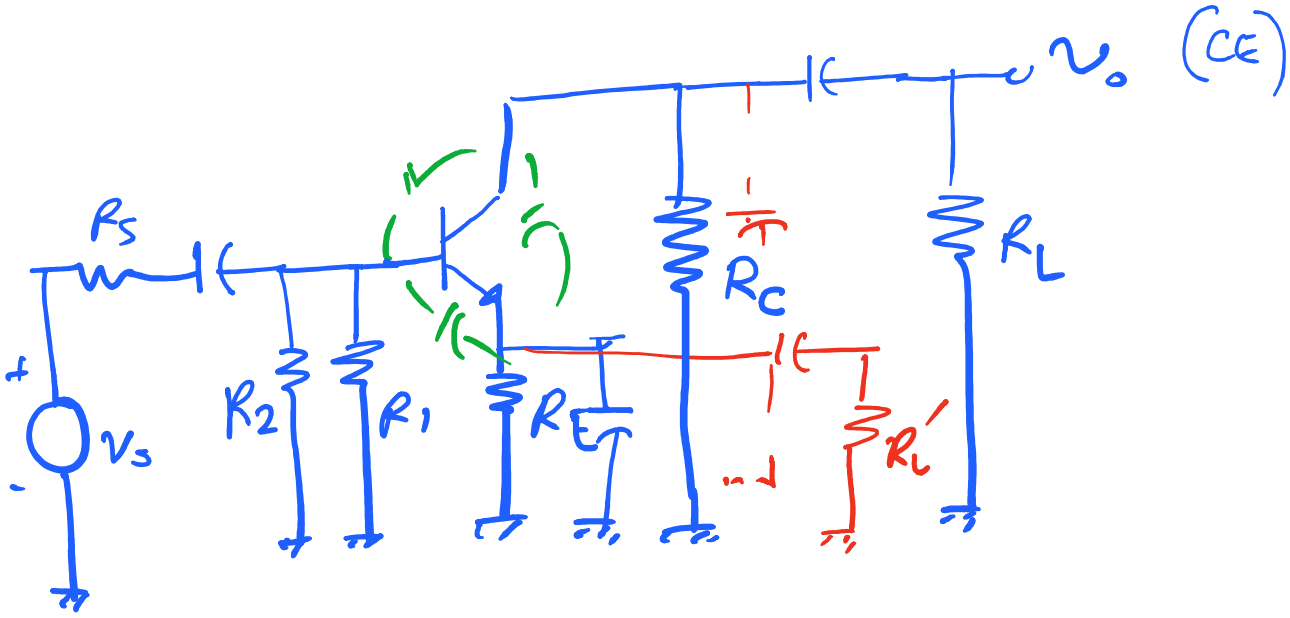
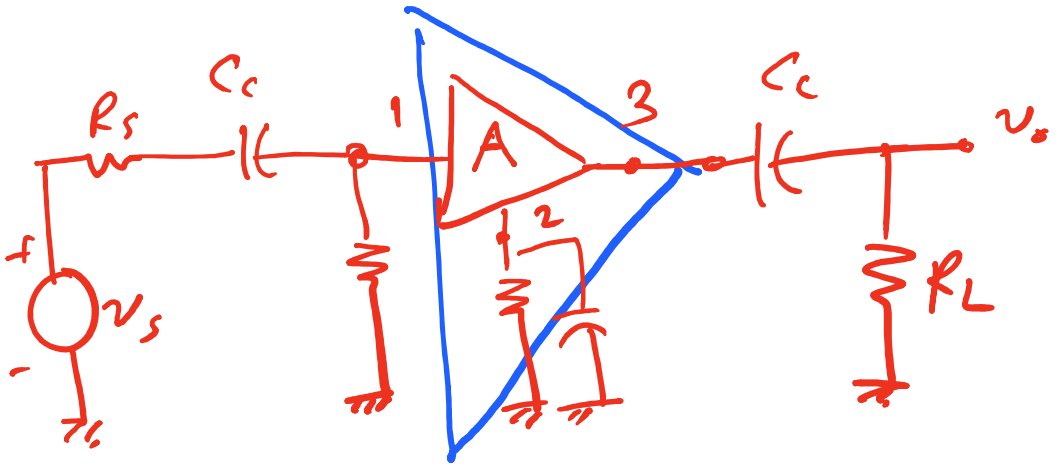
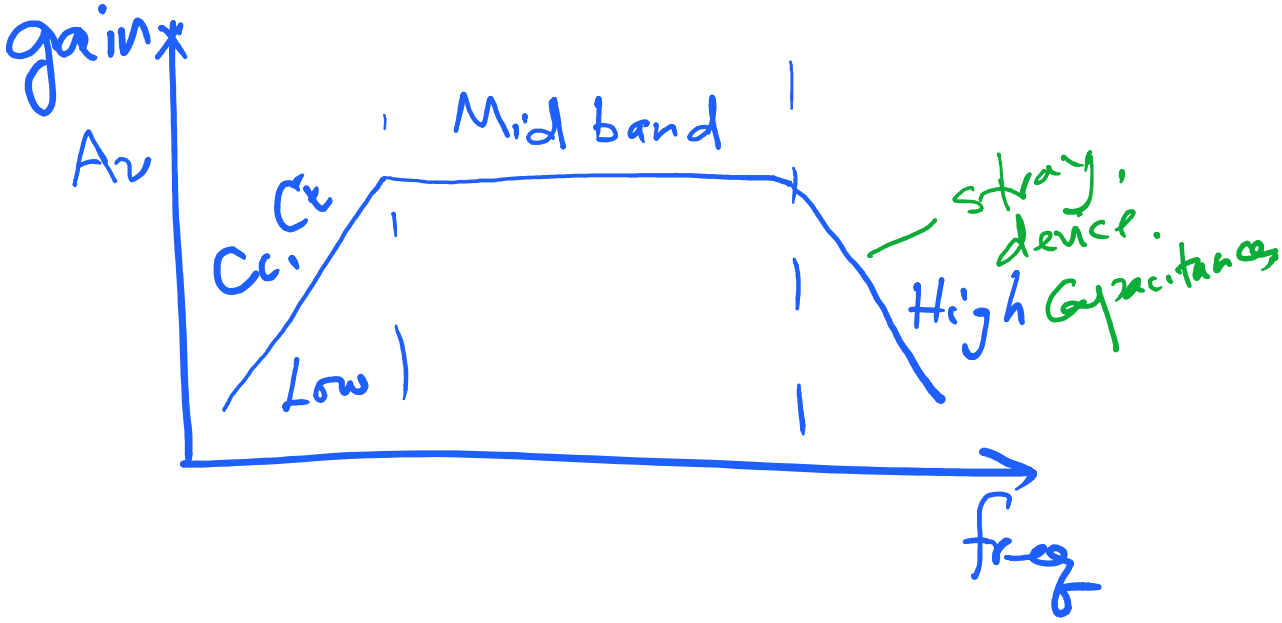
Freq Respons-1

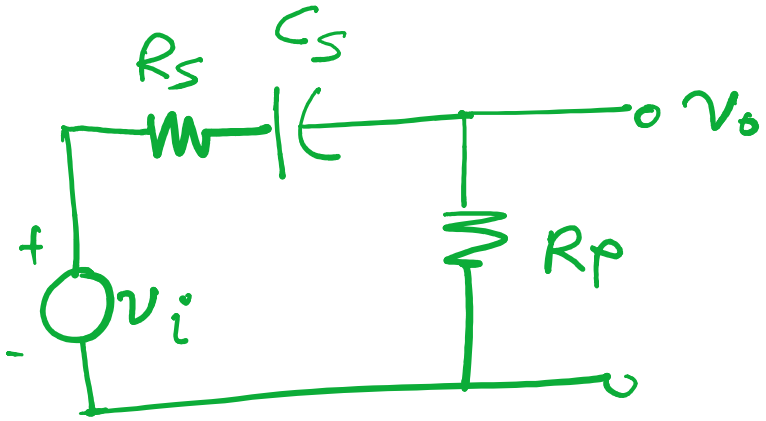
Wednesday, September 7, 2016 8:38 AM











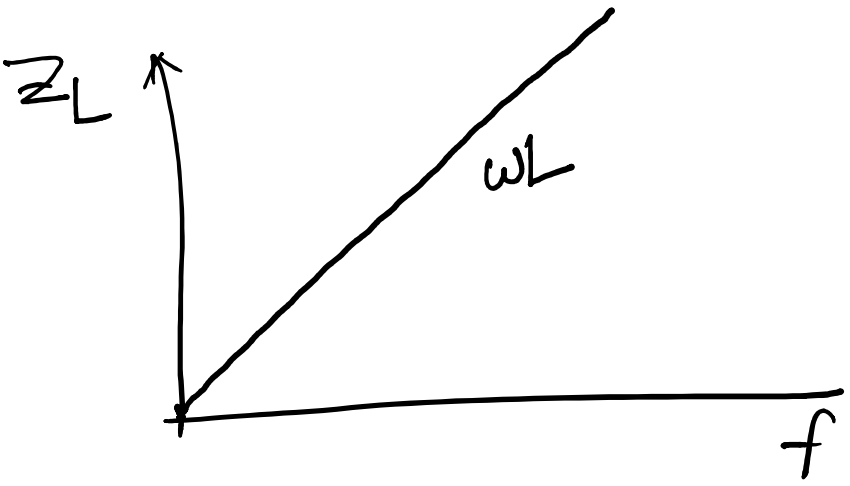
$$Z = R + jX$$

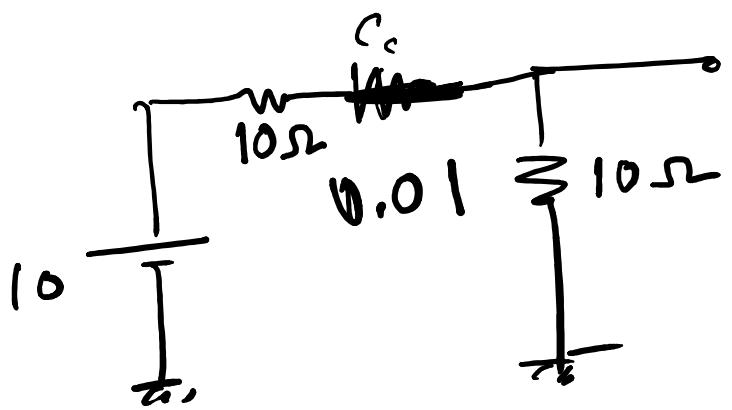
$$R \rightarrow Z_R = R$$

$$L \rightarrow Z_L = j\omega L = sL$$

$$C \rightarrow Z_C = \frac{1}{j\omega C} = \frac{1}{sC}$$

$C \rightarrow Z_C : \frac{1}{j\omega C} = \frac{1}{sC}$





$$v_o = \frac{10}{100\times10^{3}+10}$$

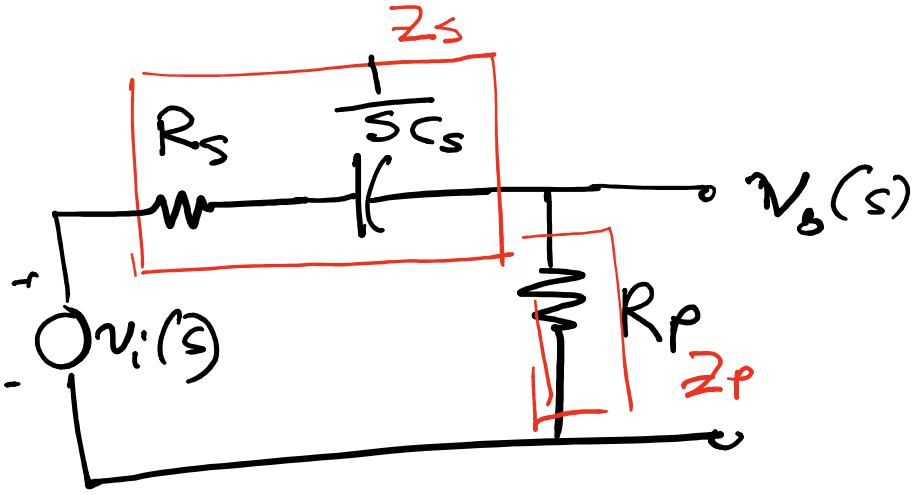
$$= \frac{10}{10\times10^{3}+10}$$

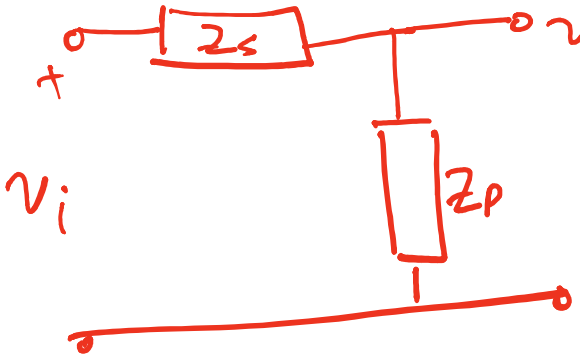
$$= \frac{10}{10+10} = 0.5V$$

$$= \frac{10}{10+0.01} \simeq 5V$$

$$T(s) = \frac{v_o(s)}{}$$

$$T(s) = \frac{v_o(s)}{v_i(s)}$$





$$v_o = \frac{v_i Z_p}{Z_s + Z_p}$$

$$T(s) = \frac{v_o}{v_i} = \frac{Z_p}{Z_s + Z_p}$$

$$Z_s + Z_p = R_s + \frac{1}{sC_s} + R_p$$

$$= (R_s + R_p) + \frac{1}{sC_s}$$

$$= \frac{(R_s + R_p)C_s s + 1}{}$$

$$= \frac{(R_S+R_P)C_S s + 1}{s C_S}$$

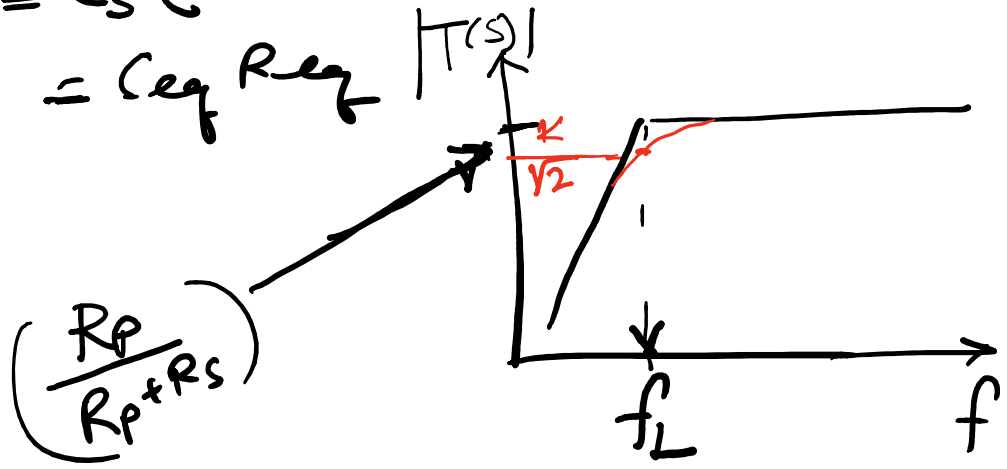
$$T(s) = \frac{Z_P}{Z_S+Z_P} = \frac{R_P s C_S}{1 + s C_S (R_S+R_P)}$$

$$= \frac{R_P}{R_S+R_P} \cdot \frac{s C_S (R_S+R_P)}{1 + s C_S (R_S+R_P)}$$

$$= \frac{R_P}{R_S+R_P} \frac{s\tau_S}{1 + s\tau_S}$$

$$\tau_S = C_S (R_S+R_P) \Rightarrow \text{time const.}$$

$$= C_{eq} R_{eq}$$



$$\boxed{\omega_L = \frac{1}{\tau_S}} = 2\pi f_L$$

$$f_L = \frac{1}{2\pi\tau_S}$$

$$\frac{R_P}{\qquad} \frac{1}{\qquad}$$

$$T(s) = \frac{R_p}{R_p + R_s} \cdot \frac{1}{\frac{1}{s\tau_s} + 1}$$

$$= K \cdot \frac{1}{\frac{1}{j\omega\tau_s} + 1}$$

$$= K \cdot \frac{1}{\frac{\omega_L}{j\omega} + 1}$$

$$= K \cdot \frac{1}{-j + 1} \qquad \boxed{\omega = \omega_L}$$

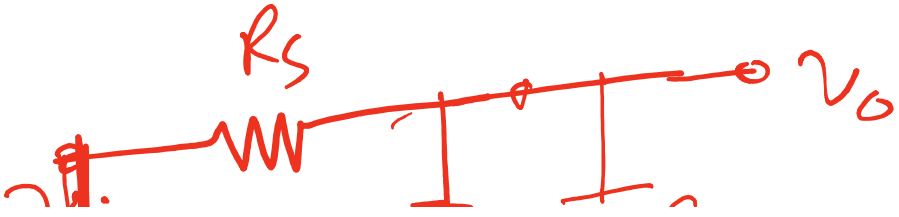
$$|T(s)| = \frac{K}{\sqrt{2}} \longrightarrow$$

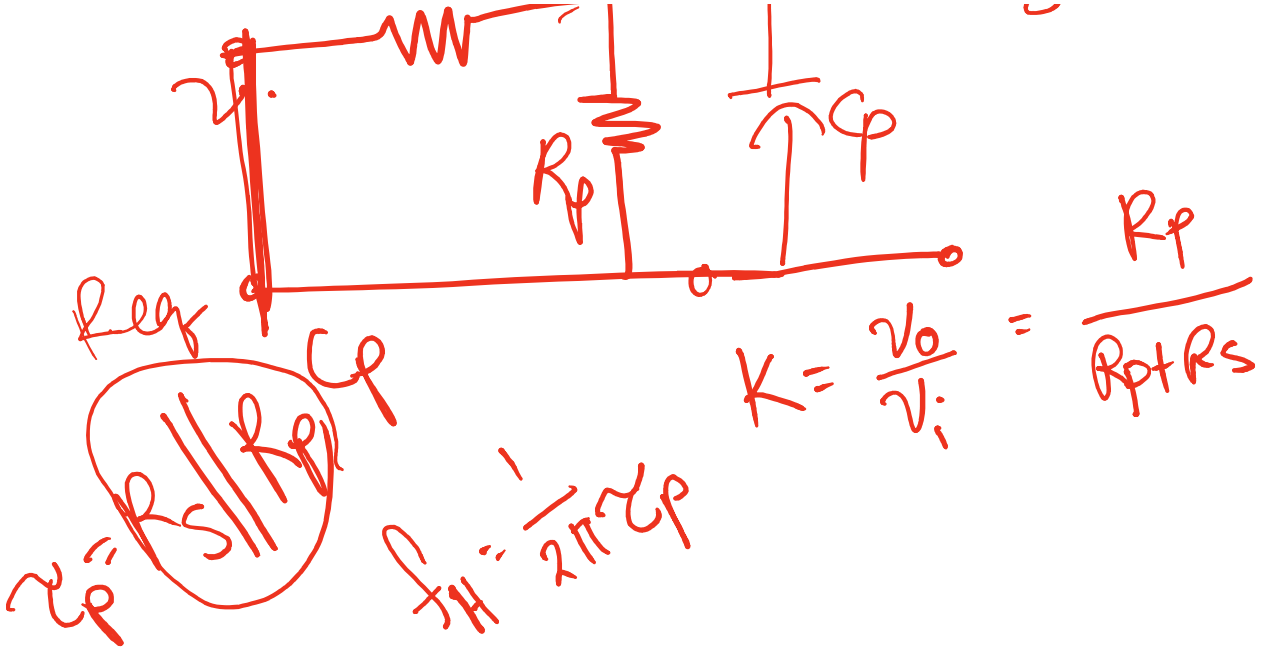
$$\boxed{\omega = \frac{1}{\tau}}$$ Corner freq.

$\tau \Rightarrow C_{eq} R_{eq}$.

$K \Rightarrow$ Max Gain

No Capacitance effect




R_p
C_p
R_{eq}
C_p
$R_S \| R_p$
τ_p
$f_H = \frac{1}{2\pi\tau_p}$
$K = \frac{v_o}{v_i} = \frac{R_p}{R_p + R_s}$