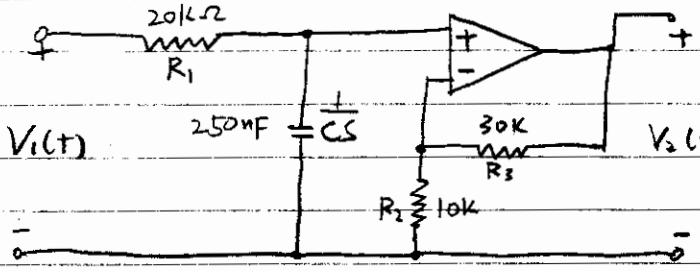
12-3



$R_1 = 20k$

$R_2 = 10k$

$R_3 = 30k$

$C = 250nF$

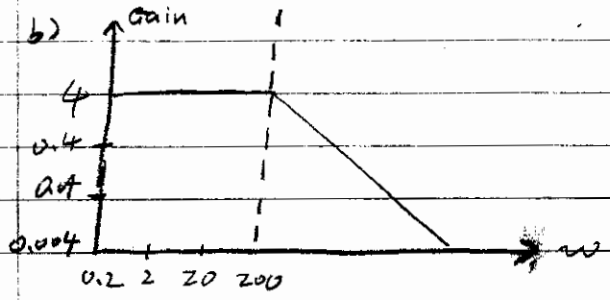
$$\Rightarrow \frac{\frac{1}{CS}}{R_1 + \frac{1}{CS}} = \frac{1}{R_1 CS + 1}$$

$$\Rightarrow T_V(S) = \left[\frac{1}{R_1 CS + 1}\right] \cdot \left[\frac{R_3 + R_2}{R_2}\right] = \frac{R_3 + R_2}{R_1 R_2 CS + R_2} = \frac{40000}{50S + 10000}$$

$$= \frac{800}{S + 200}$$

a) $|T_V(0)| = 4$, $|T_V(\infty)| = 0$, $\omega_c = 200$ rad/s, Low-Pass

b)



c) $$\left.\frac{R_3 + R_2}{R_1 R_2 CS + R_2}\right|_{S=0} = \frac{R_3 + R_2}{R_2}$$

$$\Rightarrow \begin{cases} R_3 + R_2 = 10 \\ R_2 = 1 \end{cases}$$

Since $R_2 = 10k$, change $R_3 = 90k$