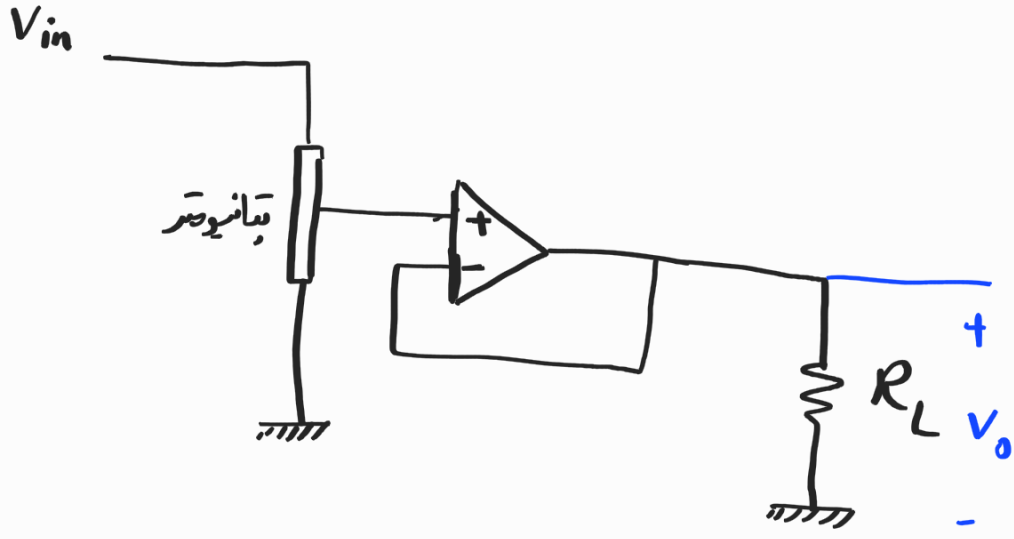
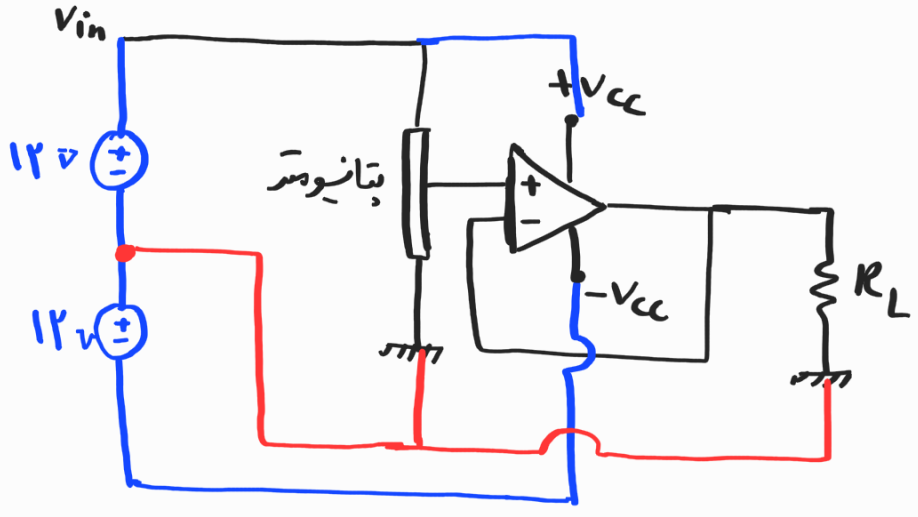
آپ امپ ایده آل

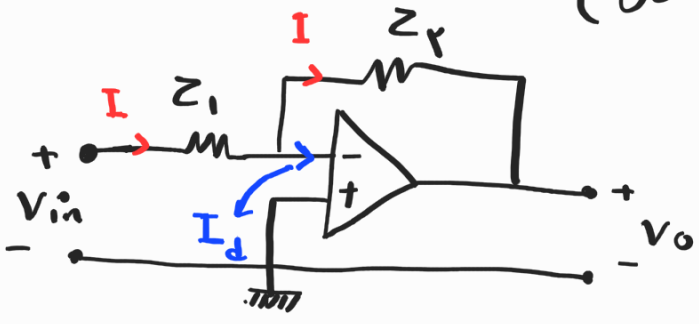
(نرم افزار) opap



(TL074)



تابع تبدیل (انتقال):



آپ امپ ایده‌آل :

$V^+ = V^-$

$I_d = 0 \longrightarrow$ بالا بودن مقاومت ورودی آپ امپ در ناحیه خطی

$V^+ = 0 \longrightarrow V^- = 0$

$V_{in} - Z_1 I = 0$

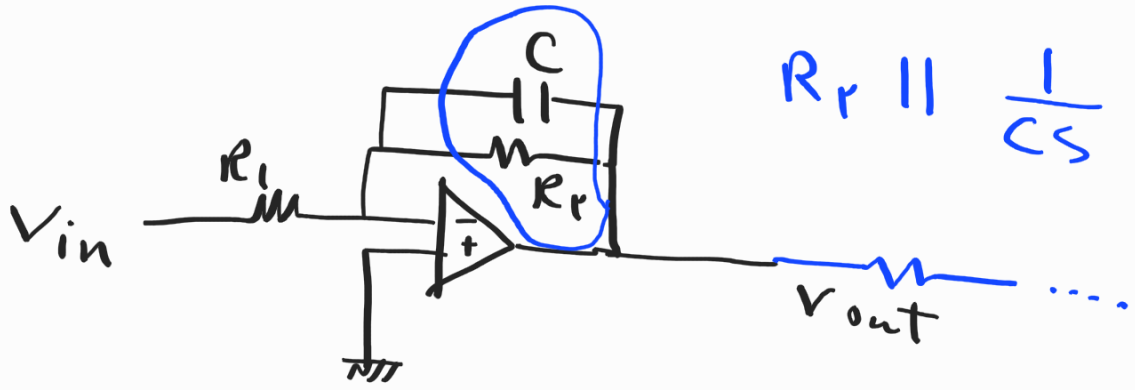
$0 - Z_2 I = V_{out}$ $\Rightarrow$ $\boxed{\frac{V_{out}}{V_{in}} = \frac{-Z_2}{Z_1}}$

ساخت تابع تبدیل $G(s) = \frac{1}{0.033s + 1}$:

$R \longrightarrow R$

$C \longrightarrow \frac{1}{Cs}$

$L \longrightarrow Ls$



$R_f \parallel \frac{1}{Cs}$

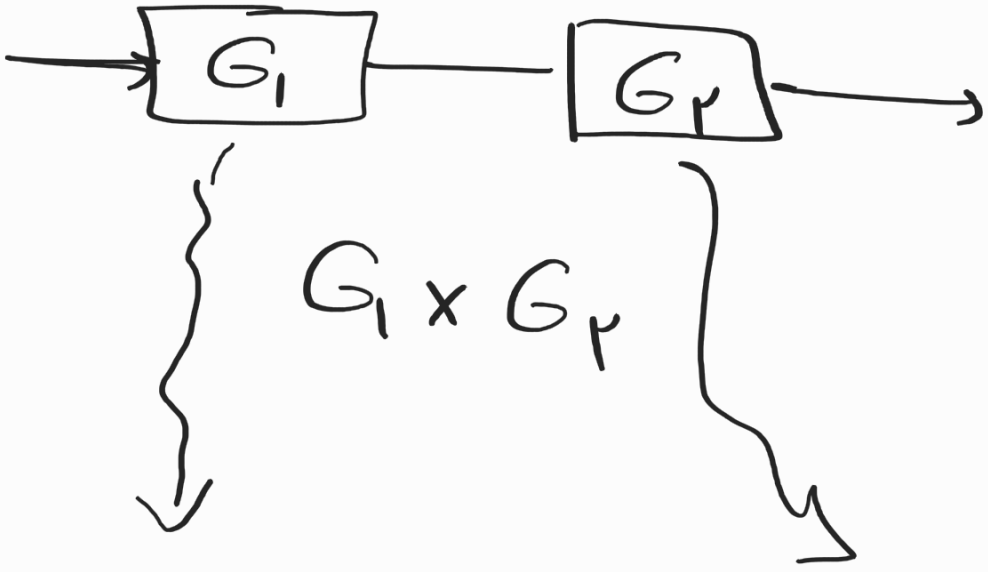
$$Z_1 = R_1$$

$$Z_f = \frac{\frac{R_f}{Cs}}{R_f + \frac{1}{Cs}} = \frac{R_f}{1 + R_f Cs}$$

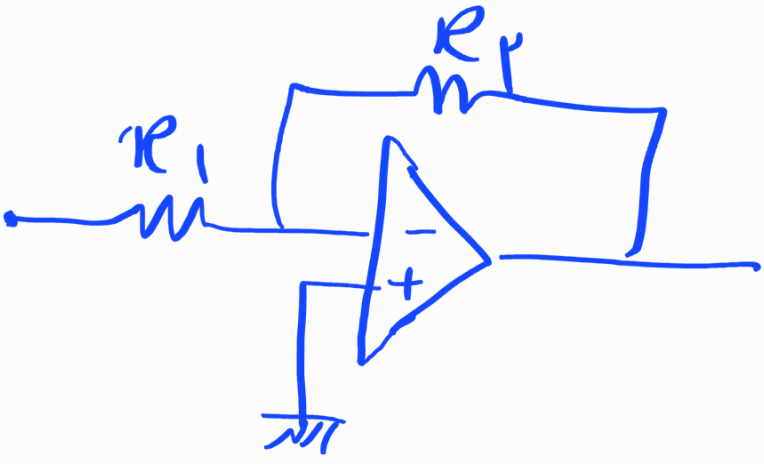
$$\frac{V_{out}}{V_{in}} = -\frac{Z_f}{Z_1} = -\frac{R_f}{R_1(1 + R_f Cs)}$$

$$= \frac{-\frac{R_f}{R_1}}{1 + R_f Cs} = \frac{1}{1 + \%..\mu\mu_s}$$

$$\begin{cases} \frac{R_f}{R_1} = 1 \\ R_f C = \%..\mu\mu \end{cases} \longrightarrow \begin{cases} R_1 = R_f = \mu\mu_k \\ C = 100\ nF \end{cases}$$



$$\frac{-1}{1+0.0033s} \times (-1) = \frac{1}{1+0.0033s}$$



$$\frac{-R_2}{R_1} = -1$$