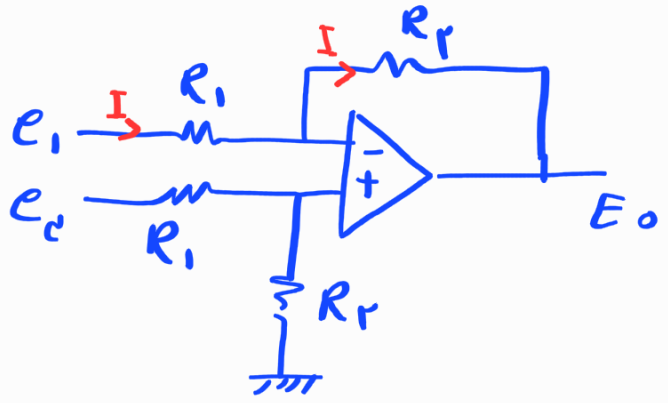
تقویت‌کننده تفاضلی واحد:



① $V^+ = \frac{R_2}{R_1 + R_2} e_2$

② $e_1 - (R_1 + R_2) I = E_0$

③ $V^- - R_2 I = E_0 \xrightarrow{V^- = V^+} \frac{R_2}{R_1 + R_2} e_2 - R_2 I = E_0$

$$\Rightarrow I = \frac{1}{R_1 + R_2} e_2 - \frac{E_0}{R_2} \quad *$$

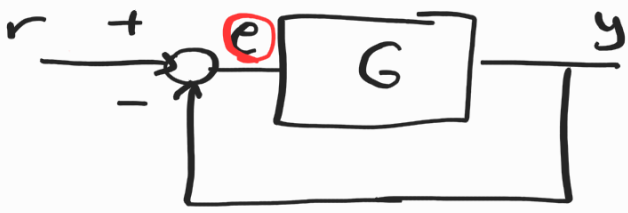
جایگذاری در ② $\Longrightarrow$

$$e_1 - (R_1 + R_2)\left(\frac{1}{R_1 + R_2} e_2 - \frac{E_0}{R_2}\right) = E_0$$

$$\Rightarrow e_1 - e_2 + \frac{R_1}{R_2} E_0 + E_0 = E_0$$

$$\Rightarrow \boxed{E_0 = \frac{R_2}{R_1}(e_2 - e_1)}$$

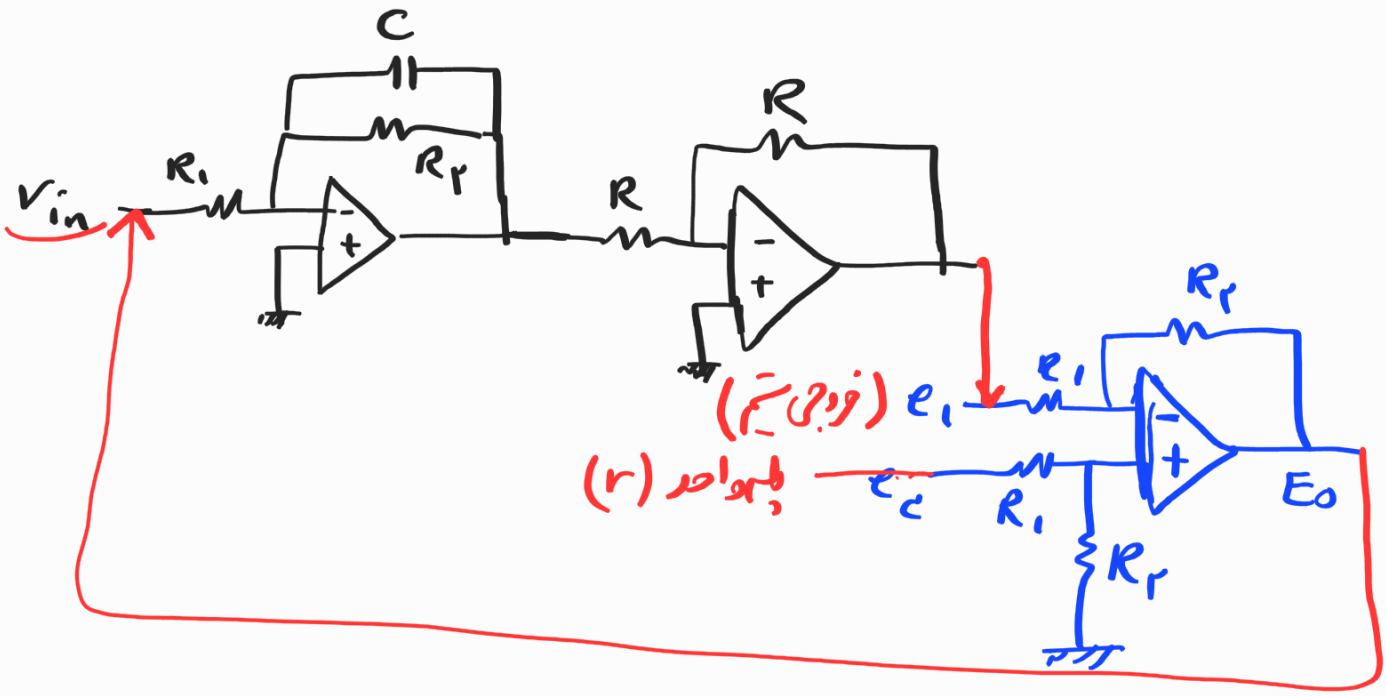
if $\frac{R_2}{R_1} = 1 \longrightarrow E_o = e_2 - e_1$

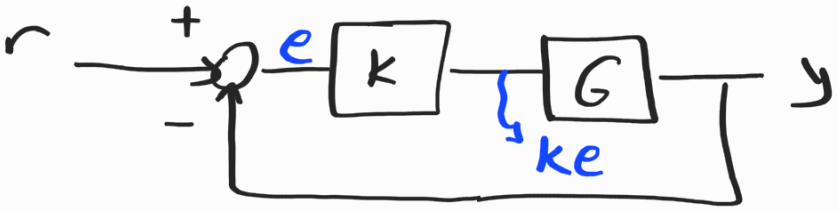


e_2 ← ورودی مرجع

e_1 ← خروجی سیستم

E_o ← سیگنال خطا

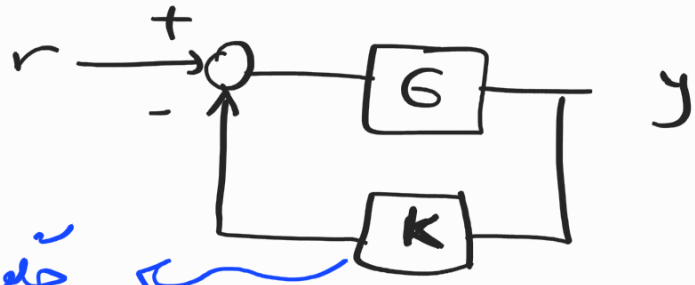




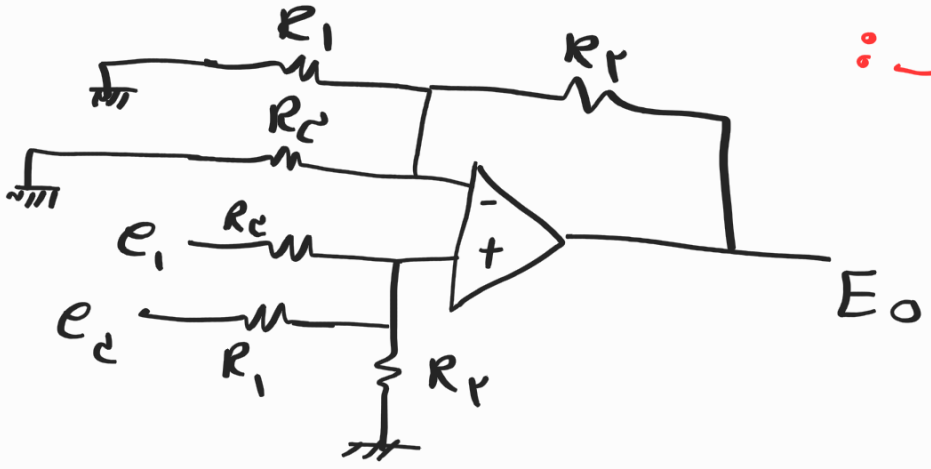
حال اگر

if $\frac{R_2}{R_1} = k$ ✓

حال اگر



!؟

چگونه در عمل تولید شود؟!

فیدبک مثبت: