



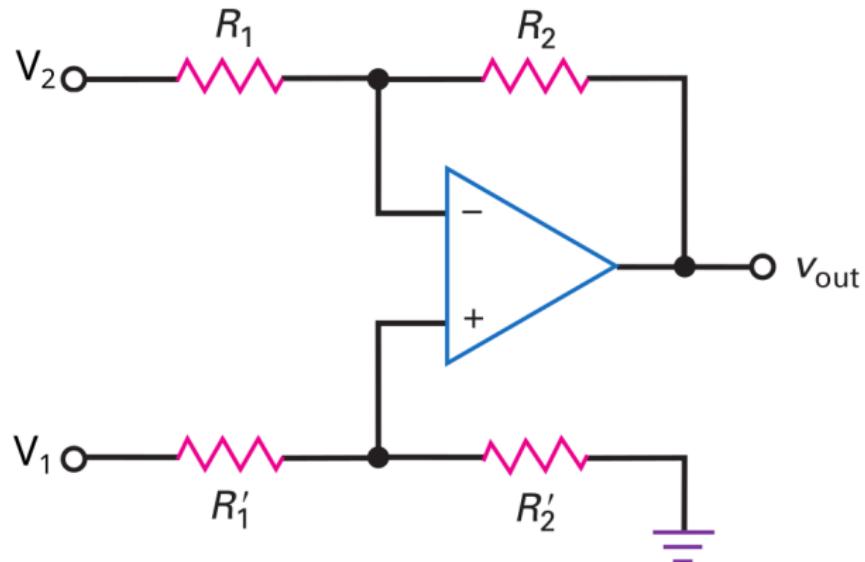
Differential Amplifier

Mifta Nur Farid

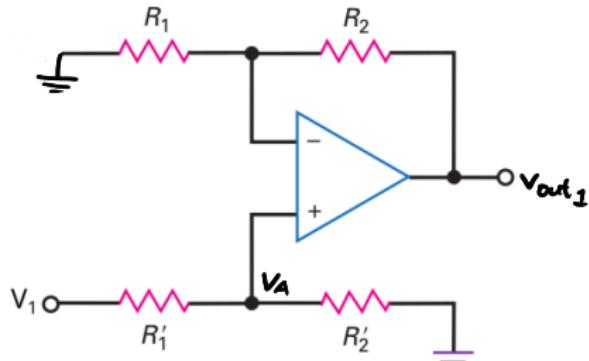
16 March 2023

Electronic Circuit II

Differential Amplifier



Differential Amplifier



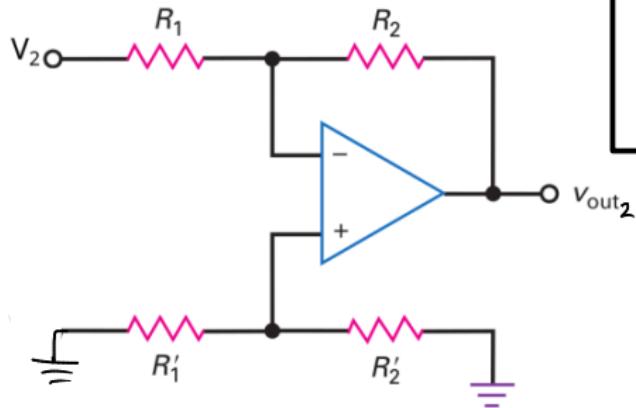
$$V_{out_1} = \left(1 + \frac{R_2}{R_1} \right) V_A$$

$$V_A = \frac{R_2'}{R_1' + R_2'} \cdot V_1$$

sehingga

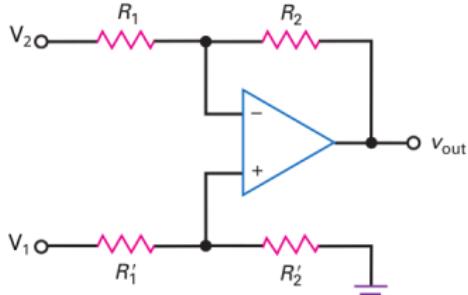
$$V_{out_1} = \left(1 + \frac{R_2}{R_1} \right) \frac{R_2'}{R_1' + R_2'} \cdot V_1$$

Differential Amplifier



$$V_{out2} = - \frac{R_2}{R_1} \cdot V_2$$

Differential Amplifier



$$\begin{aligned}V_{\text{out}} &= V_{\text{out}_1} + V_{\text{out}_2} \\&= \left(1 + \frac{R_2}{R_1}\right) \frac{R_2}{R_1 + R_2} \cdot V_1 - \frac{R_2}{R_1} \cdot V_2\end{aligned}$$

misalkan :

$$R_1 = R_2 = R_1' + R_2' = R$$

maka

$$\begin{aligned}V_{\text{out}} &= \left(1 + \frac{R_2}{R_1}\right) \frac{R_2}{R_1 + R_2} \cdot V_1 - \frac{R_2}{R_1} \cdot V_2 \\&= \left(1 + \frac{R}{R}\right) \frac{R}{R+R} \cdot V_1 - \frac{R}{R} \cdot V_2 \\&= (1+1) \frac{R}{2R} V_1 - V_2 \\&= \cancel{\frac{R}{2R}} V_1 - V_2\end{aligned}$$

$V_{\text{out}} = V_1 - V_2 \quad \text{jika } R_1 = R_2 = R_1' + R_2' = R$