Electronic Circuit II

Negative Feedback

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ELEKTRO ITK

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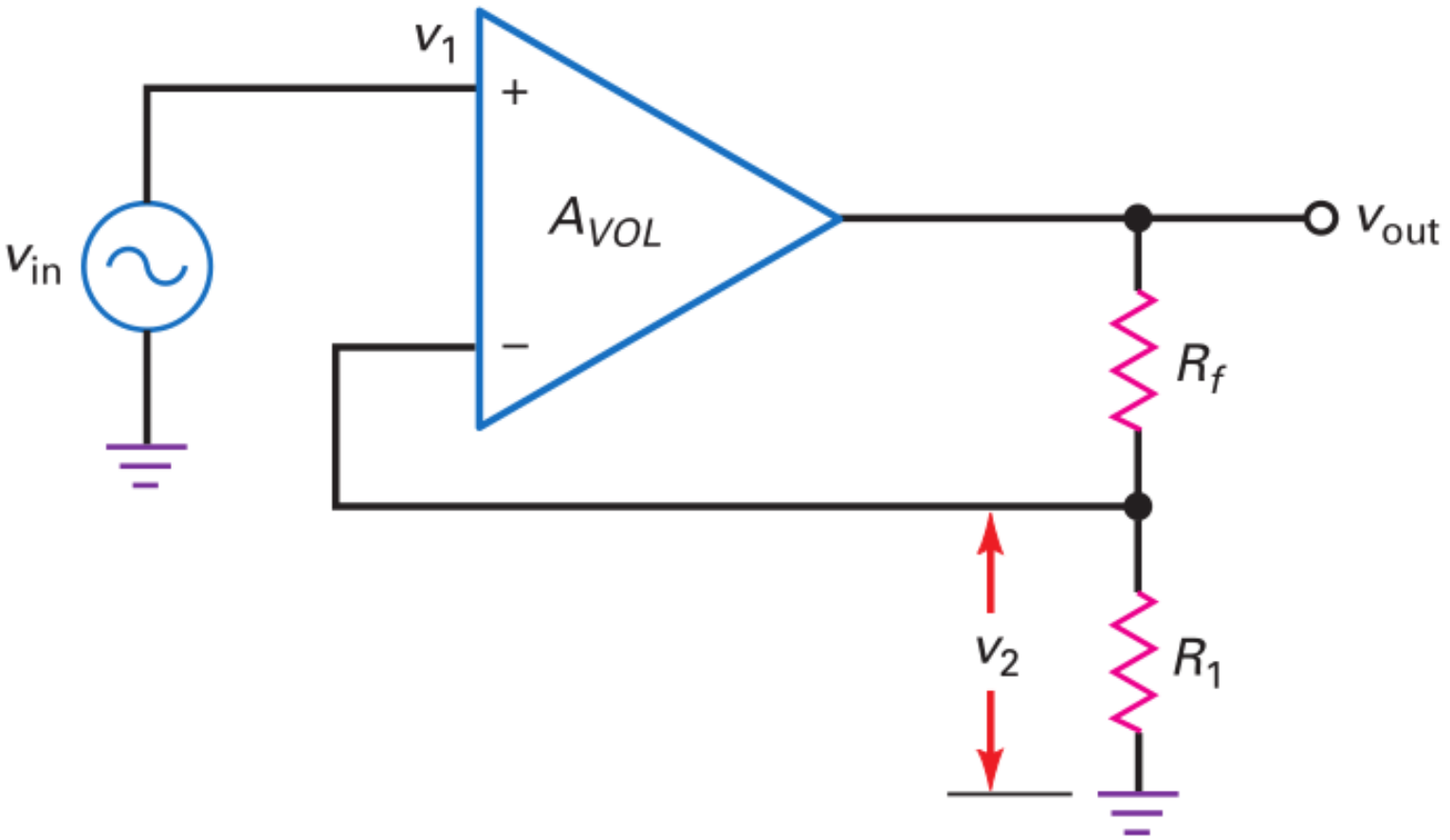
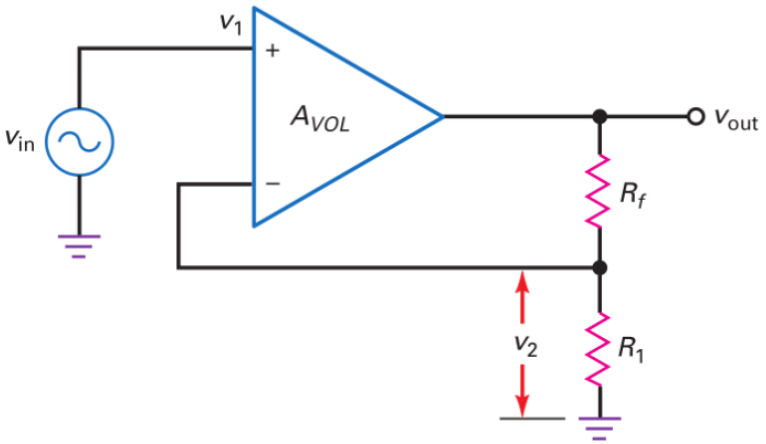
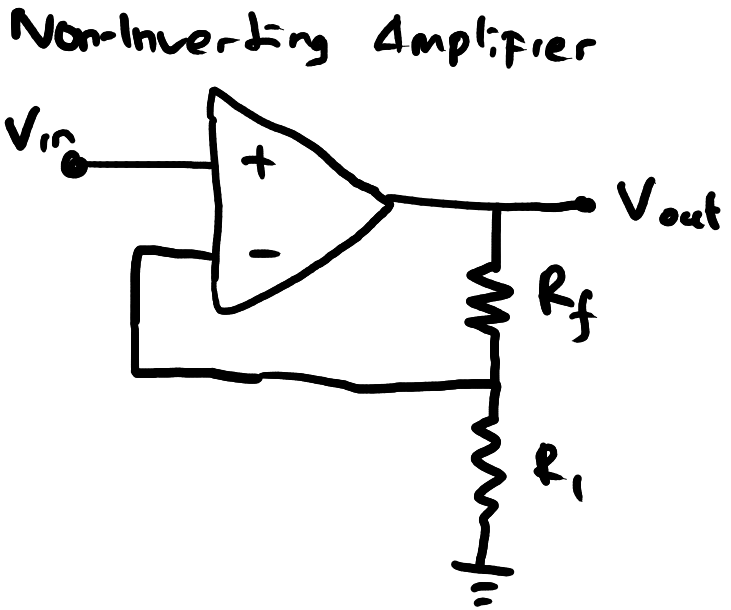
Voltage-Controlled Voltage Source



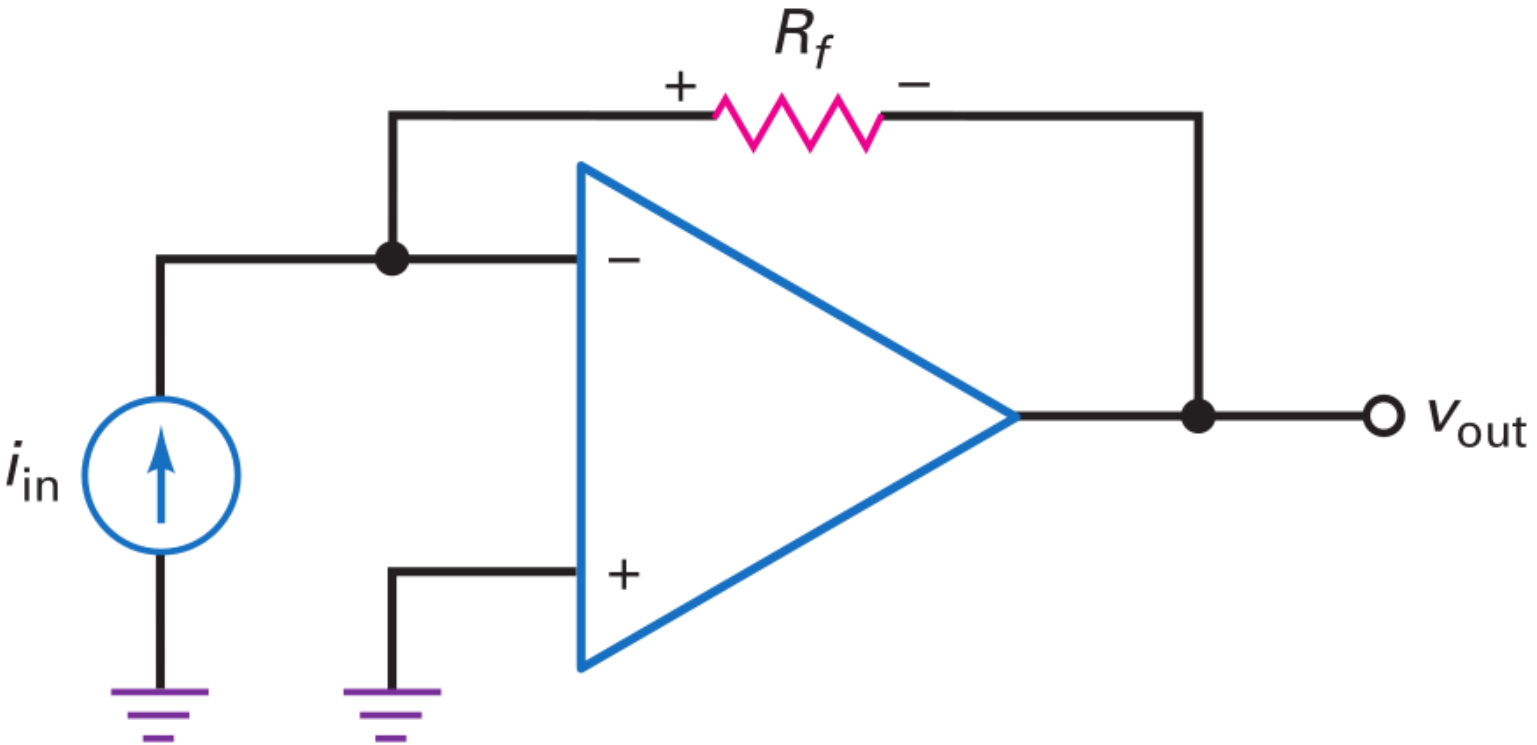
Voltage-Controlled Voltage Source



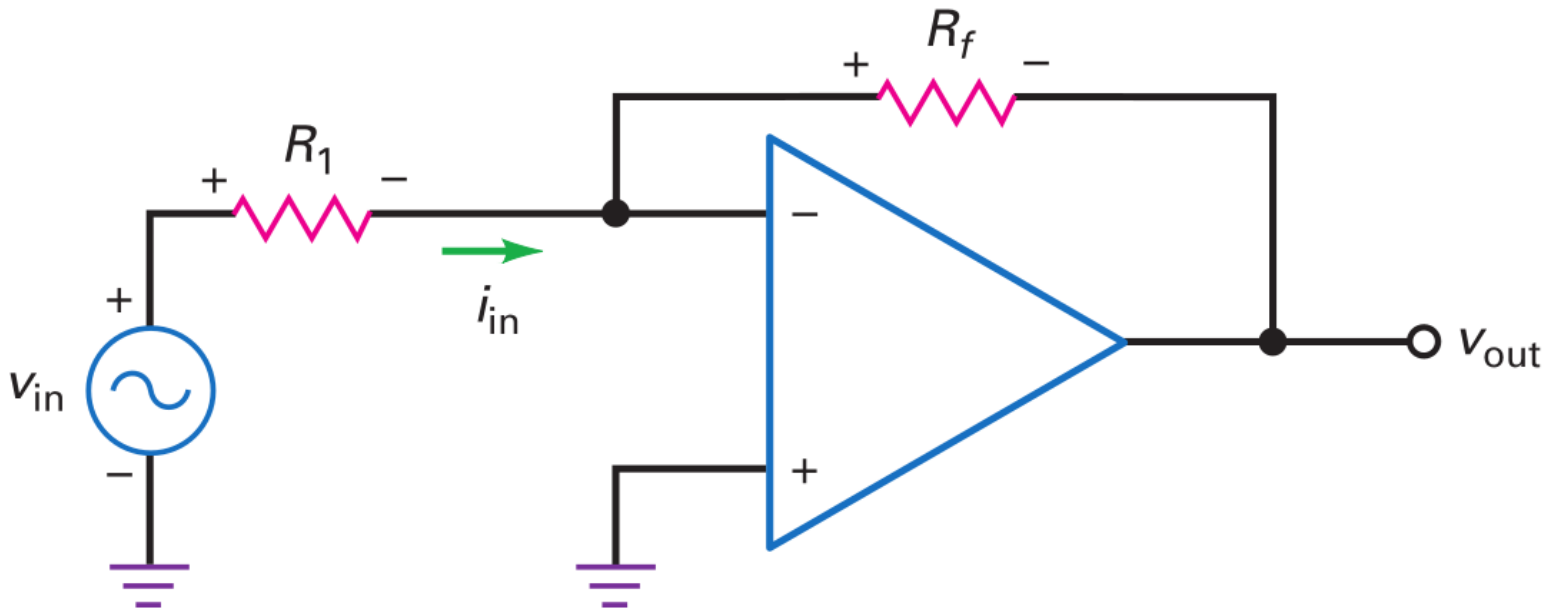


$$V_{out} = \left(\frac{R_f}{R_1} + 1\right) V_{in}$$

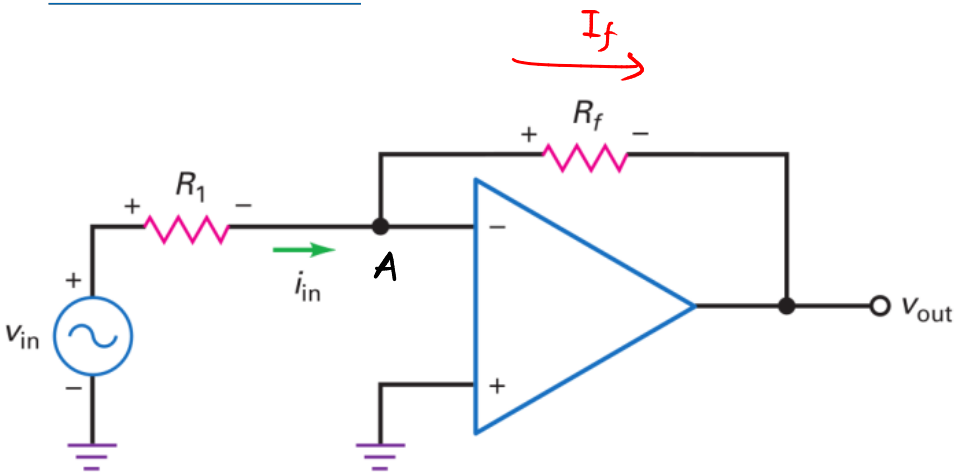
Current-Controlled Voltage Source



Current-Controlled Voltage Source



Current-Controlled Voltage Source



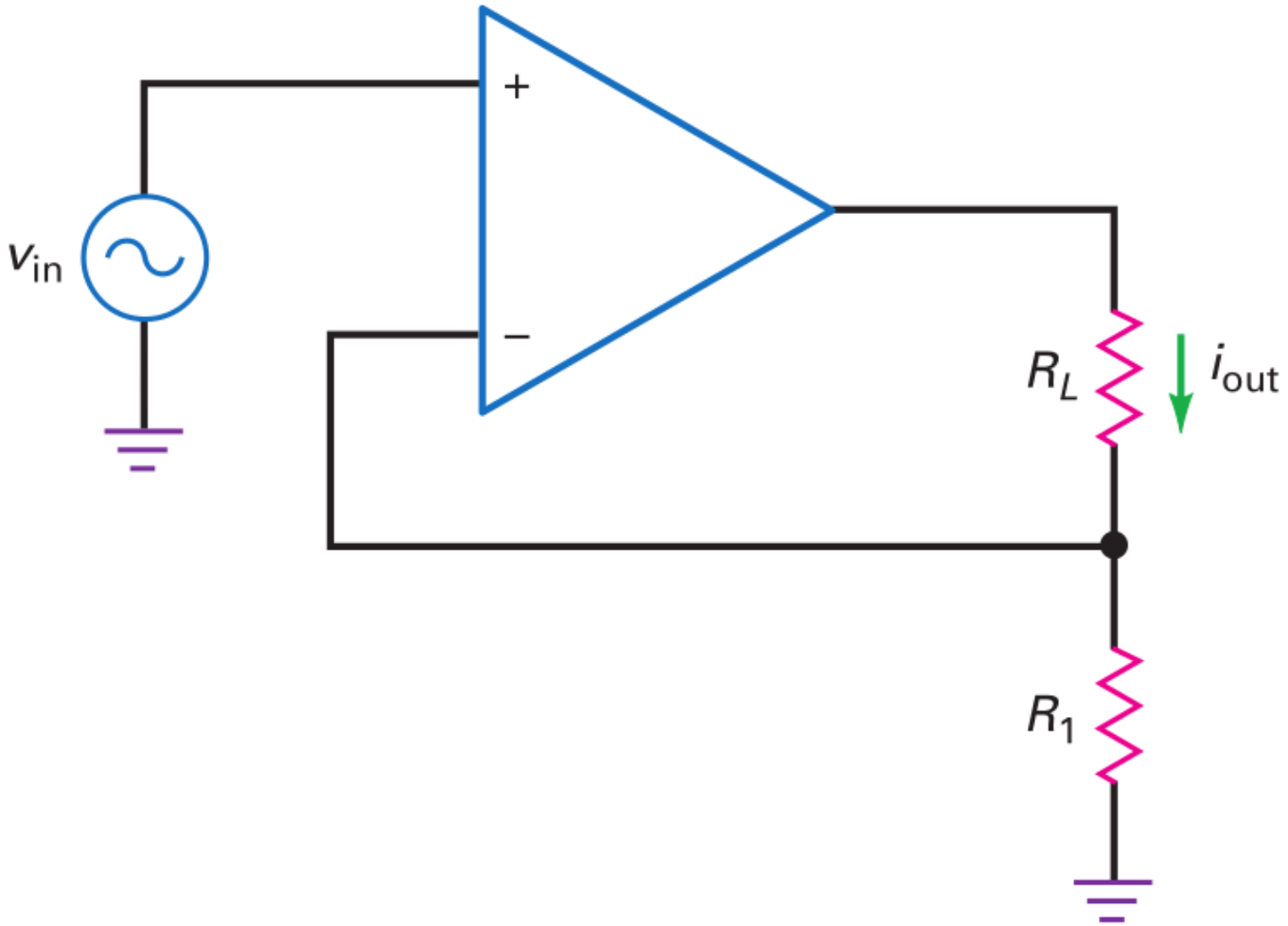
$$I_f = I_{in}$$

$$\frac{V_A - V_{out}}{R_f} = I_{in}$$

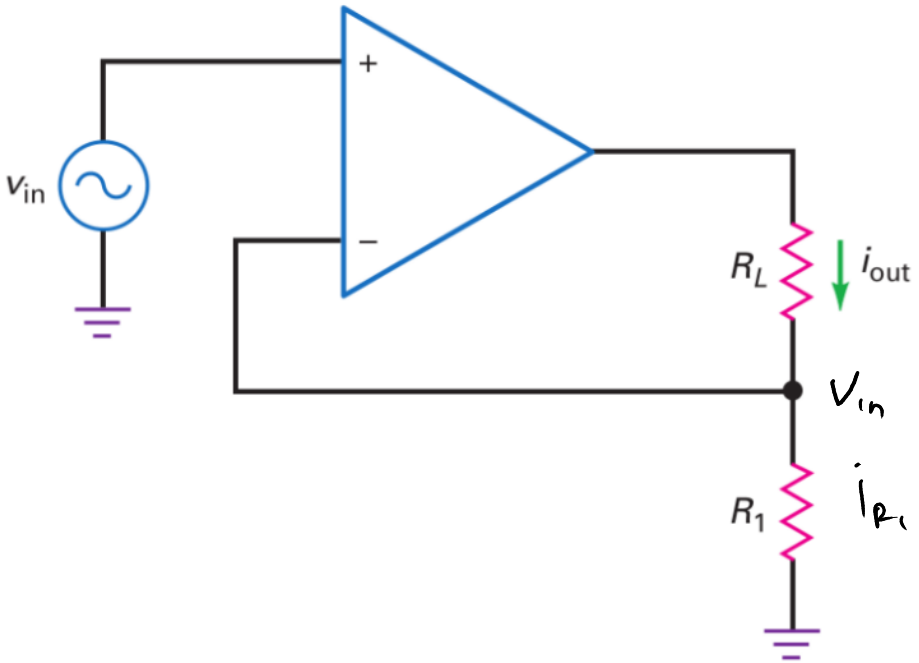
$$-V_{out} = I_{in} \cdot R_f$$

$$V_{out} = -I_{in} R_f$$

Voltage-Controlled Current Source

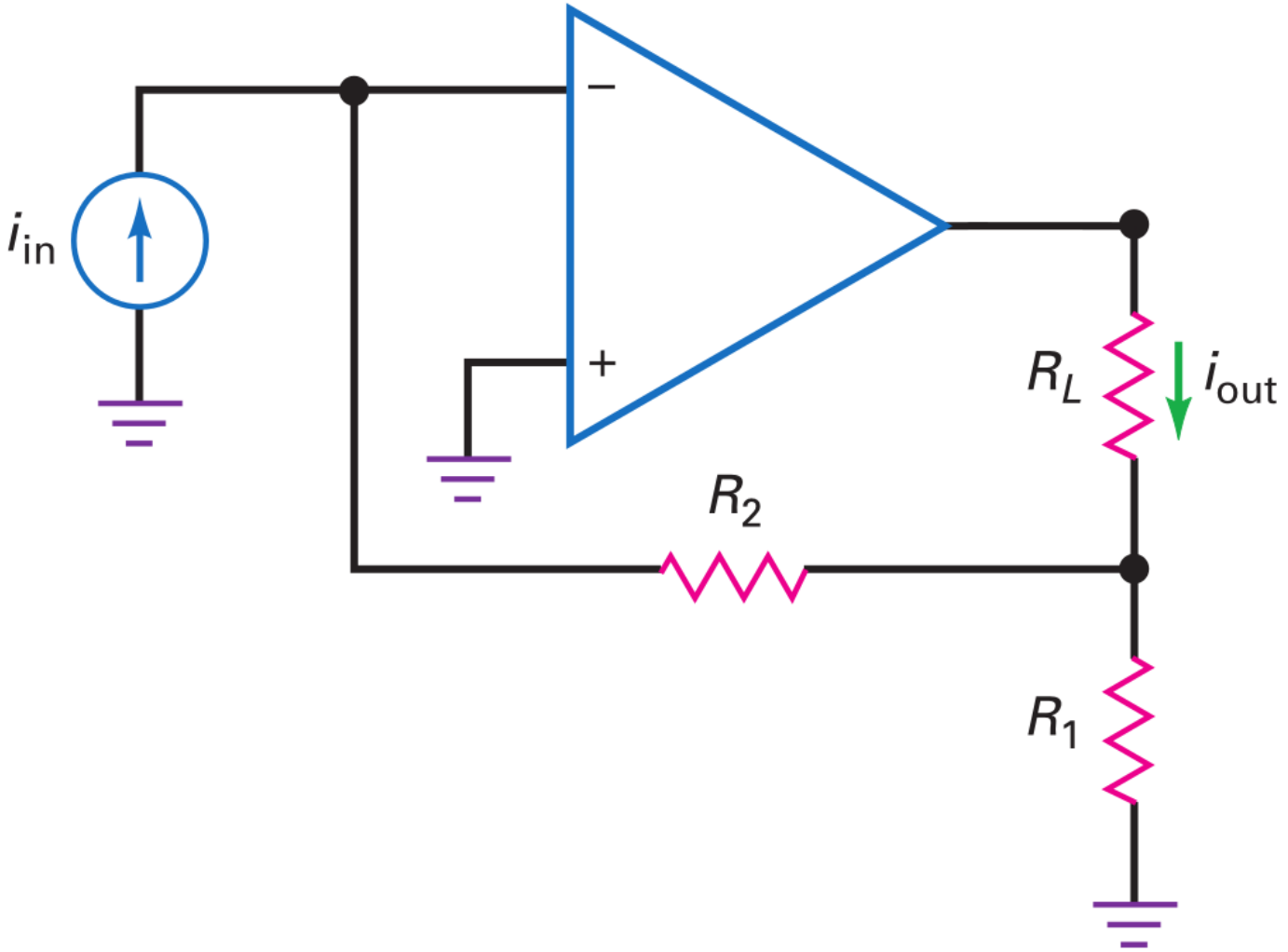


Voltage-Controlled Current Source

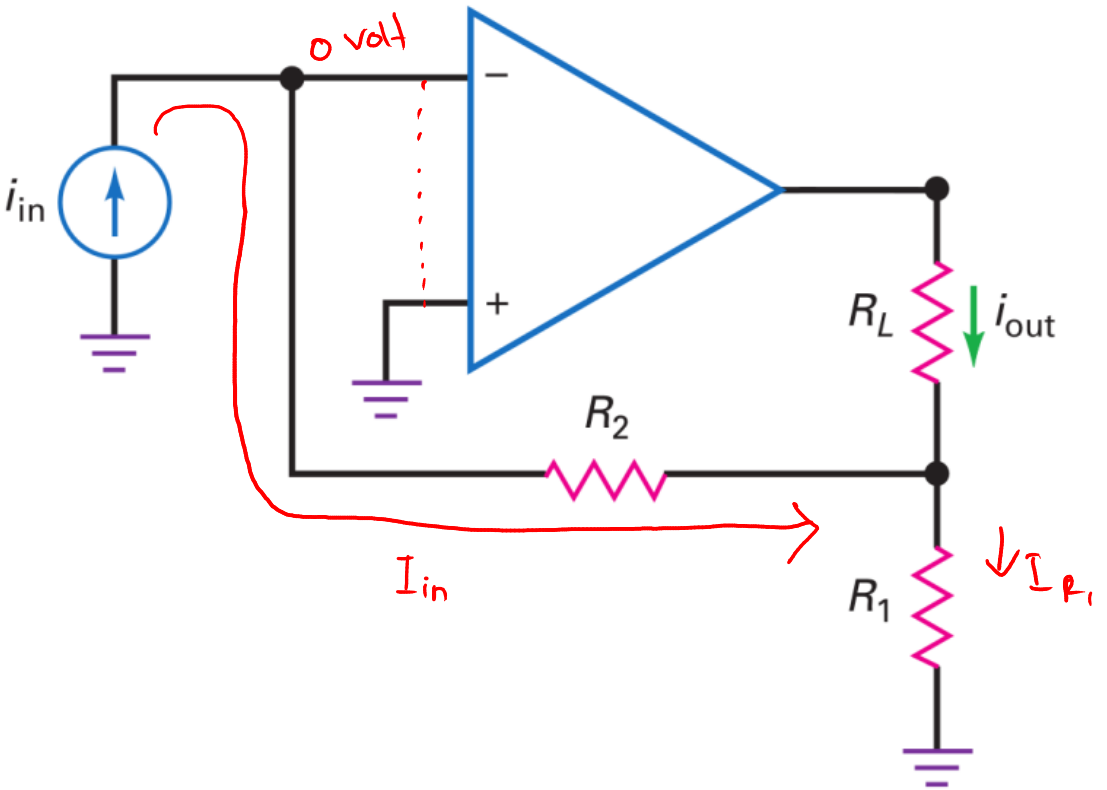


$$i_{out} = i_{R_1} = \frac{V_{in}}{R_1}$$

Current-Controlled Current Source



Current-Controlled Current Source



$$\Sigma V = 0$$

$$I_{in} R_2 + (I_{in} + I_{out}) R_1 = 0$$

$$I_{in} R_2 + I_{in} R_1 + I_{out} R_1 = 0$$

$$I_{in} (R_2 + R_1) + I_{out} R_1 = 0$$

$$-I_{in} \left(\frac{R_2 + R_1}{R_1} \right) = I_{out}$$

$$I_{out} = -\left(\frac{R_2 + R_1}{R_1} \right) I_{in}$$

$$I_{out} = -\left(\frac{R_2}{R_1} + 1 \right) I_{in}$$