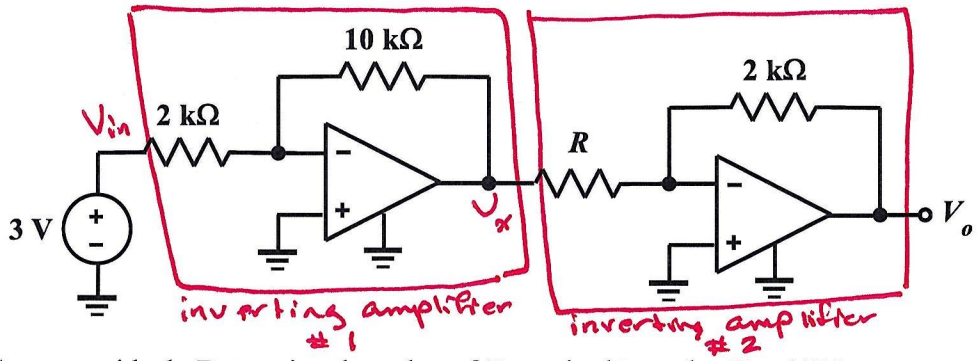
EE 2240

Homework Problem #053



The OpAmps are ideal. Determine the value of R required to make $V_o = 15\,\text{V}$.

$$V_x = -\frac{10\,k\Omega}{2\,k\Omega} \cdot V_{in}$$

$$= -5 \cdot (3\,V)$$

$$= -15\,V$$

$$V_o = -\frac{2\,k\Omega}{R} \cdot V_x$$

$$= -\frac{2\,k\Omega}{R} \cdot (-15\,V)$$

$$= \frac{30}{R}\,k\Omega V$$

$$V_o = 15\,V \Rightarrow \frac{30}{R}\,k\Omega V = 15\,V$$

$$\text{or} \quad R = \frac{30}{15}\,k\Omega$$

$$= 2\,k\Omega$$