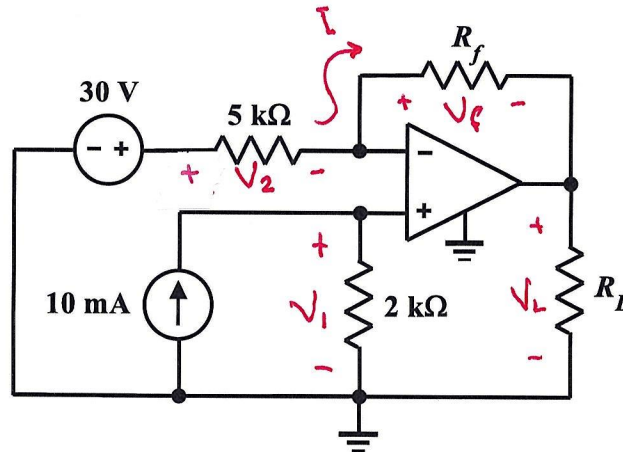


EE 2240
Homework Problem #055



The OpAmp is ideal. Determine the value of R_f that will cause R_L to absorb NO power (0W).

$$V_1 = (2k\Omega)(10mA) = 20V$$

$$V_2 = 30V - V_1 = 10V$$

$$I = \frac{V_2}{5k\Omega} = 2mA$$

$$V_f = R_f I = (2 \times 10^{-3}) R_f$$

$$V_L = -V_f + V_1$$

$$P = 0 \Rightarrow V_L = 0 \Rightarrow V_f = V_1$$

$$(2 \times 10^{-3}) R_f = 20$$

$$\Rightarrow R_f = \frac{20}{2 \times 10^{-3}} = 10k\Omega$$