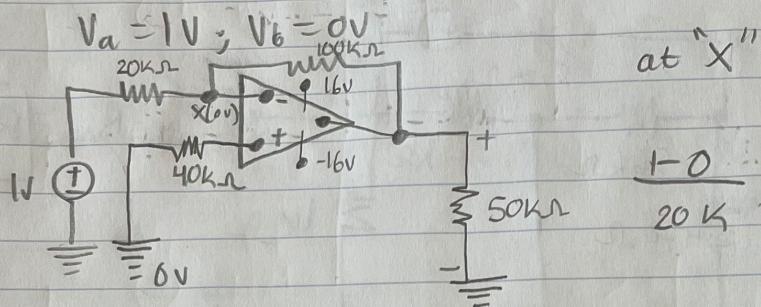


# Homework #6-1

Problem 1: Assuming an ideal OpAmp, compute  $V_o$  when  $V_a = 1V$ ,  $V_b = 0V$   
Is the OpAmp operating in the linear region?

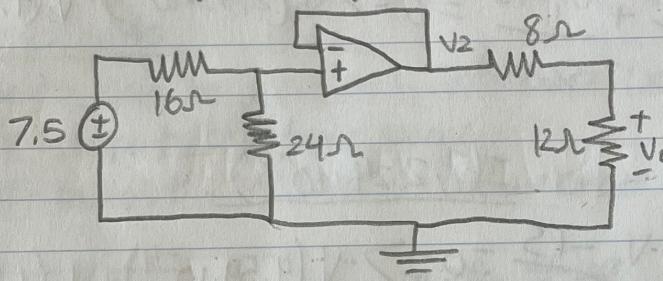


$$\frac{1 - O}{20k} = \frac{O - V_o}{100k}$$

$$\frac{1}{20k} = \frac{V_o}{100k}$$

$$\frac{100}{20} = V_o \Rightarrow -5V$$

Problem 2: Find  $V_o$  assuming an ideal OpAmp



$$V_i = \frac{7.5 \cdot 24}{24 + 16} = 4.5V$$

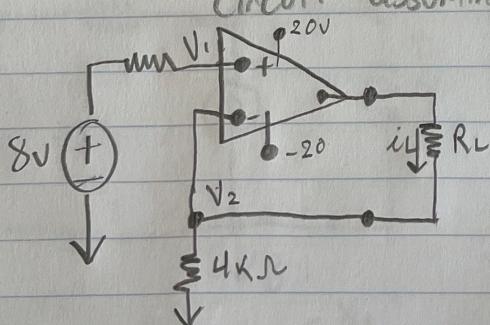
$$V_i = V^-$$

$$V^- = V_2 = 4.5V$$

$$V_o = \frac{V_2 \cdot 12}{12 + 8} = \frac{4.5 \cdot 12}{20} = -2.7V$$

Problem 3: a) Find the value of the current  $i_L$  in the following OpAmp

circuit assuming linear operating



$$V_i = 8 - 0 \cdot 50 = 8V$$

$$V_2 = V_i = 8V \rightarrow$$

$$i_L = 2A$$

$$V_2 / 4 + 0 - i_L = 0 \Rightarrow i_L = \frac{V_2}{4} = \frac{8}{4} = 2A$$