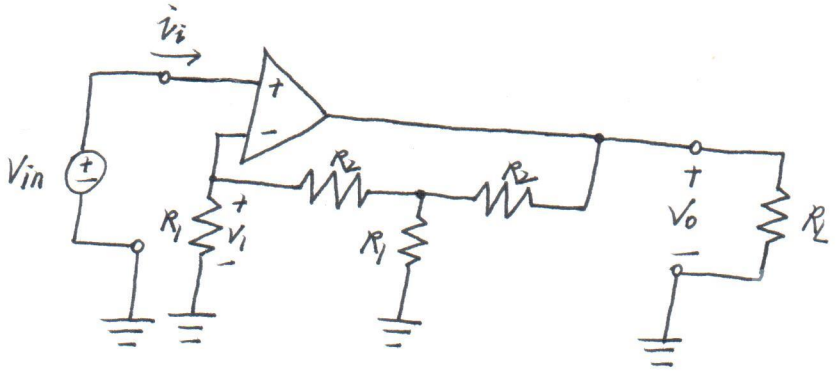
4.6



First, we verify that negative feedback is present

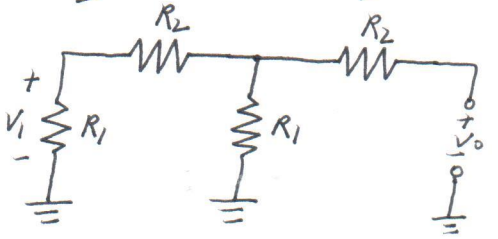
(a)

According to the summing-point constraint:

$i_i = 0$

$V_{in} = V_1$

According to the voltage-divider principle:



$$V_{in} = V_1 = V_o \frac{R_1^2}{R_1^2 + 3R_1R_2 + R_2^2}$$

$$A_V = \frac{V_o}{V_{in}} = 1 + \left(\frac{R_2}{R_1}\right)^2 + 3\left(\frac{R_2}{R_1}\right)$$

(b)

For $R_1 = 1k\Omega$ and $R_2 = 10k\Omega$

$A_V = 131$

(c)

$R_{in} = \frac{V_{in}}{i_i} = \infty$ (theoretically)

(d)

$R_o = 0\Omega$