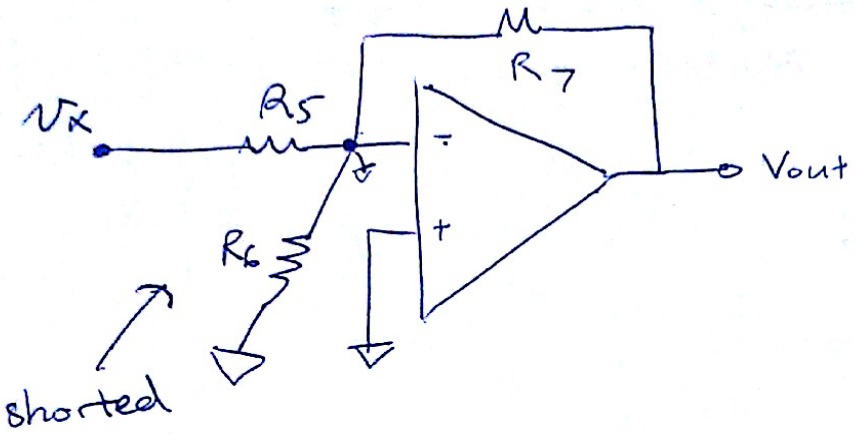
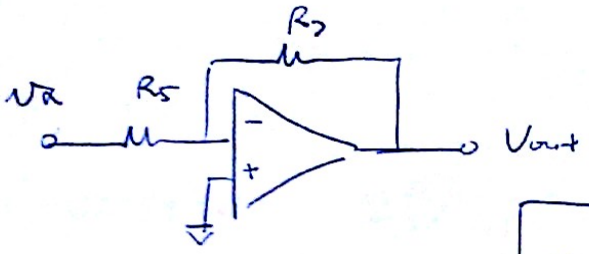
Grader = Andre

MT # 2 Problem 4

a)

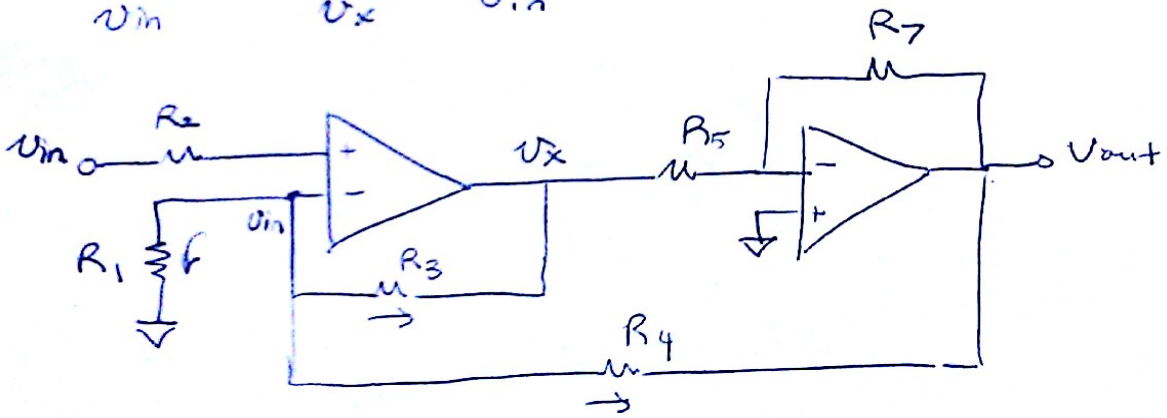




$\Rightarrow$ Inverting amp $\Rightarrow$ $\boxed{\frac{v_{out}}{v_x} = -\frac{R_7}{R_5}}$

b)

$$\frac{v_{out}}{v_{in}} = \frac{v_{out}}{v_x} \cdot \frac{v_x}{v_{in}}$$



$$\frac{v_{in}}{R_1} + \frac{v_{in} - v_x}{R_3} + \frac{v_{in} - v_{out}}{R_4} = 0$$

$$\frac{v_{in}}{R_1} + \frac{v_{in}}{R_3} + \frac{v_{in}}{R_4} = \frac{v_{out}}{R_4} + \frac{v_x}{R_3} = \frac{v_{out}}{R_4} - \frac{R_5}{R_7 R_3} v_{out}$$

$$\boxed{\frac{v_{out}}{v_{in}} = \frac{1/R_1 + 1/R_3 + 1/R_4}{1/R_4 - \frac{R_5}{R_3 R_7}} = \frac{R_3 R_4 R_7 + R_1 R_4 R_7 + R_1 R_3 R_7}{R_1 R_3 R_7 - R_1 R_4 R_5}}$$