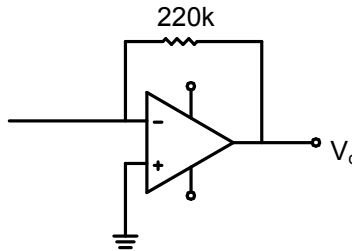ET 438a
Continuous and Digital Control
OP AMP Averaging Circuits

1a.) Complete the schematic of the circuit started below so that it will give an output that is -3 times the average of 4 input voltages. Label the values of the resistors necessary to design the circuit on the completed schematic.

220k

V_o

b.) For the circuit designed above, find the output value, V_o, if the four input voltages are 0.35, -.125, 0.67, -0.45 Vdc

2a.) Complete the circuit shown below to construct a 3 input non-inverting averaging circuit that has a gain of 2. The resistors available for this design are limited to 1 MΩ, 500 kΩ, 5 kΩ, and 2.5 kΩ. You can use any number of these values in the design. Design the circuit to have minimum loading effect on the devices attached to the input and use the minimum number of resistors.

10k

V_o
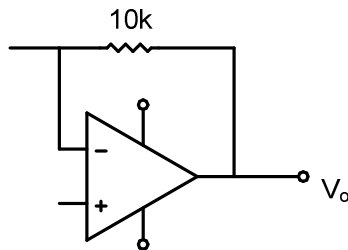
b.) Compute the value of the second averaged input voltage, V_2 if the output is 6.78 Vdc and the other two inputs are 3.75 and 2.55 Vdc.