

Use ideal op-amps and resistors to design a circuit that implements the function

$$v_o = -0.5v_1 + 8v_2 - 5v_3 + 5v_4.$$

There are four inputs to the circuit. Note that you cannot arbitrarily change the polarity of one of the input voltages. (You cannot “turn it upside down” to get a negative value.)

You can use up to three op amps and as many resistors as you want, but a “better” design would use fewer components. (This can be done with one op amp! See Prob. 2.47 in the text book.)

Sketch your circuit below and show mathematically that it implements the desired function. Be sure to include the resistor values.