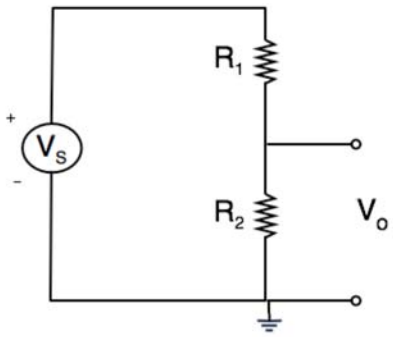
Problem Wk.7.2.2: Resistor Dividers

Part 1: Unloaded

The questions below refer to the following circuit



1. For a given set of values for R1 and R2, if R2 is then increased, will the voltage V_o increase or decrease? (Enter either `increase` or `decrease`)

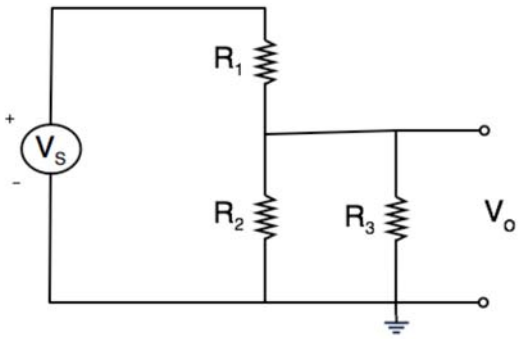
2. If R1 = 100 Ohm and R2 = 10,000 Ohm, *approximately* what is the ratio V_o/V_s? (Enter a floating point number)

3. If R1 = 10,000 Ohm and R2 = 100 Ohm, *approximately* what is the ratio V_o/V_s? (Enter a floating point number)

4. If V_o = 1/5 V_s what is the ratio R1/R2? (Enter a floating point number)

Part 2: Loaded

The questions below refer to the following circuit



Note that the only difference between this circuit and the one in the previous part is the addition of R3. We are interested in the effect on V_o of adding this resistor. Call the voltage across R2 when R3 is not present V_d. Assume R1 and R2 are 1000 Ohm.

1. If R3 has a very high value, say 100,000 Ohm, how does the new value of V_o compare to the value V_d (defined above)? Enter the approximate numerical value of V_o/V_d. (Enter a number with two digits to the right of the decimal point)

2. If R3 has a very low value, say 10 Ohm, how does the new value of V_o compare to the original value V_d? Enter the approximate numerical value of V_o/V_d. (Enter a number with two digits to the right of the decimal point)

3. If R1 = R2 = R3, how does the new value of V_o compare to the original value V_d? Enter the approximate numerical value of V_o/V_d. (Enter a number with two digits to the right of the decimal point)

6.01SC Introduction to Electrical Engineering and Computer Science

Spring 2011