**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)