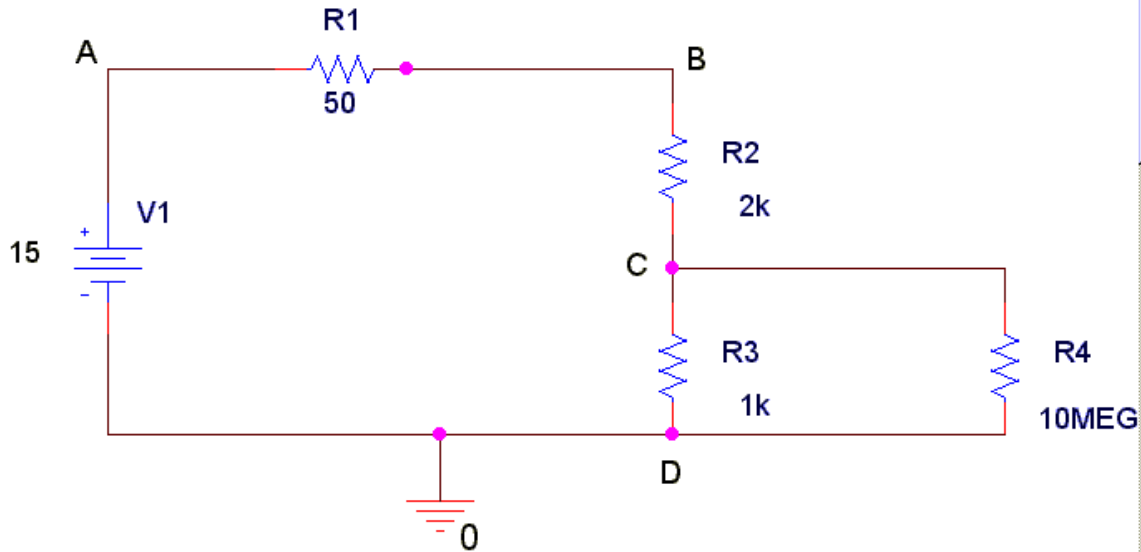


Homework #1
Equivalent Resistance

One of the essential skills that you need to acquire for this class is the ability to analyze DC circuits, which means that you must be able to determine the voltages and currents through all of the devices in the circuit.



1. In the above circuit, please find the following (Show your work.)
 - a. The equivalent resistance of the circuit.
 - b. The current through R1, R2, R3 and R4.
 - c. The voltage across R1, R2, R3 and R4.
 - d. The voltage relative to ground at points A, B, C and D.

2. Enter this circuit in Capture/Pspice and run a simulation. Use the VDC source. (Note that the values you use for step size and time are not very important, since it is DC.) Use these buttons to show the DC voltage and current at all points: Print your circuit out with this information on it.

Also place these probes across each resistor. Put the + marker on the positive side and the - marker on the negative side of each resistor. The information from these markers will be on the graph in the plot window. All should be greater than or equal to zero. Verify that the voltages given at each point relative to ground can be found by adding up the voltages across resistors between the point and ground. Also, check your answers to part 1. Generate a copy of your plot by using the Window menu and the copy to clipboard command. Once you have a copy of the plot in the clipboard, you can paste it into paint or word or wherever you would like. Include this plot with your homework, also. (Note for future reference that you can also copy circuits to the clipboard.)

3. Go to the following website: http://civil.colorado.edu/courseware/struct_labs/wheatstone.html. Read it. Hand draw a picture of what a wheatstone bridge would look like in Capture/Pspice. (Keep in mind that Pspice doesn't do diagonals. Also, you can model Rg as a fourth resistor.)