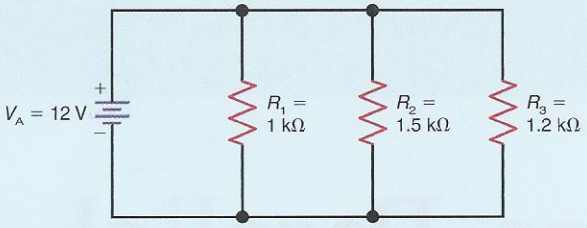
Figure 5–38



Construct the parallel circuit in Fig. 5–38. Measure and record the following values. (Note that the power supply connections must be removed to measure R_{EQ}.)

I_1 = ____, I_2 = ____, I_3 = ____, I_T = ____, R_{EQ} = ____

How does the ratio I_1/I_2 compare to the ratio R_2/R_1?_____

What is unique about comparing these ratios? _____

Add the measured branch currents I_1, I_2, and I_3. Record your answer. _____

How does this value compare to the measured value of I_T? _____

_____

Does the sum of these individual branch currents satisfy KCL? ___

In Fig. 5–38, which branch resistance dissipates the most power?

Which branch resistance dissipates the least amount of power?

_____

Remove the voltage source connections in Fig. 5–38, and add another 1.2 kΩ resistor to the right of resistor R_3. Measure and record the equivalent resistance, R_{EQ}: R_{EQ} = _____. How did adding another branch resistance affect the equivalent resistance, R_{EQ}? _____

Explain why R_{EQ} changed as it did._____

_____

Design Challenge

Examine the parallel circuit in Fig. 5–39. Determine the values for R_1, R_2, R_3, and R_4 that will provide the division of currents represented in the figure. The equivalent resistance, R_{EQ}, must equal 450 Ω. The applied voltage, V_A, can have any value.

Recommended Procedure

1. Make sure you understand the problem before you begin.
2. Draw a workable schematic on a separate sheet of paper.
3. Show all known circuit values on your hand-drawn schematic.
4. Show all your calculations in solving for R_1, R_2, R_3, and R_4.
5. Select standard values for R_1, R_2, R_3, and R_4 that are within ±10% of your calculated values.
6. Construct the circuit using the standard values from step 5.
7. If your results are way off from what you expect, seek help from your instructor.
8. If your results are close to the specified design criteria, adjust the values of R_1, R_2, R_3, or R_4 for best results.
9. You must show all calculations!
10. Have an instructor check your results, and receive your just reward.

Figure 5–39