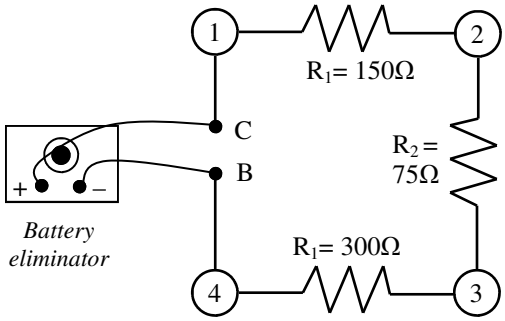
A-day: Due Mon, Apr 28

2008 PreAP Circuits 3

1. The circuit at the right has four ammeters in it to measure the current at each corner.
   A. If the battery eliminator is on, is the circuit open or closed?
   B. What happens if you put a wire between C and B?
   C. What is the total resistance of the circuit?



   D. If the battery eliminator is set to 9v, find the current in the circuit.

   E. What do the different ammeters read?

   I_1 = _____, I_2 = _____, I_3 = _____, I_4 = _____ .

   F. How much current is flowing thru the R1?
   G. How much voltage does R_1 use?

   H. Calculate the voltage used by each resistor.

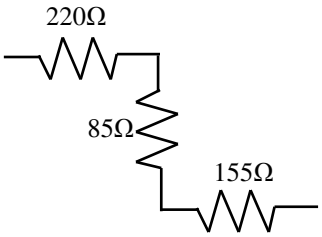
   I. Since V = IR and P = VI,
      i. Derive an equations for power that does not include voltage.

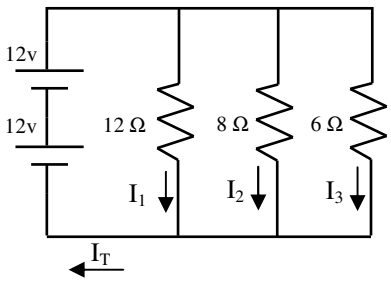
      ii. Derive an equation for power that does not include current.

   J. If each of the resistors is a light bulb, which one is the brightest?

   K. Then the 75Ω resistor is replaced by a wire.
      i. Which ammeter changes?
      ii. What does each ammeter read ?

2. What is the total resistance of the three resistors shown at the right?





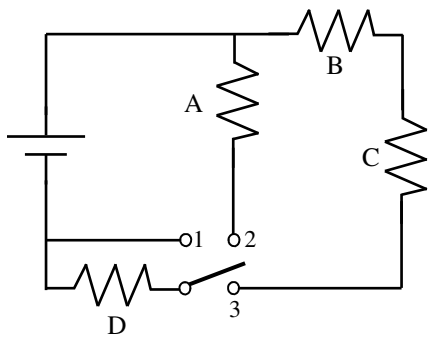
3. A. Calculate the total resistance of the three resistors in the circuit at the left.

   B. Calculate V_{total}.

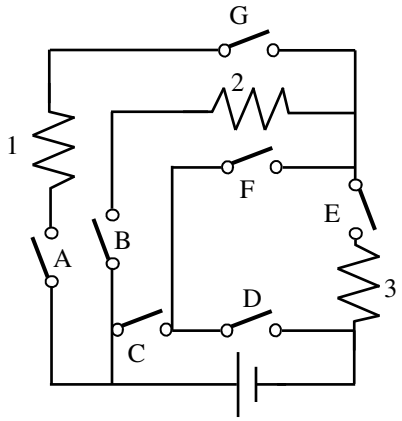
   C. What is the difference of voltage across each of the three resistors?

   D. Calculate (and label) I_1, I_2, and I_3.

   E. What is the total current?



4. A. In order for resistor A to light, the switch must be at position: _____.
   B. Are resistor A and B in series or parallel?
   C. If the switch is at position 3, B, C, and D are in series or parallel?



5. A. To make only resistor 1 on:
   B. To make only resistor 3 on:
   C. To make only resistor 1 and 3 on:

Work these problems from the book:
Starting on page 717:
Q10, 11, 14, 16, 17, 18, 21, 23, 34.
And on page 755: Q 16, 17, 18, 19