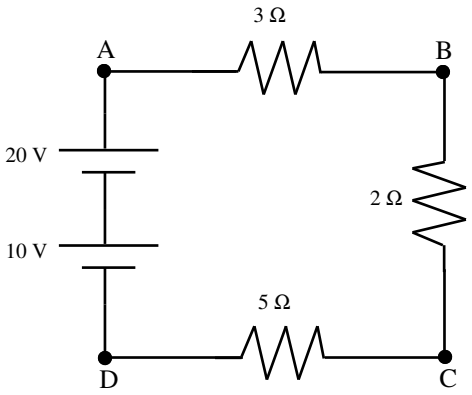
Due Tues., May 6

2008 PreAP Circuits 5

1. After working the circuit at the right, answer the following questions.

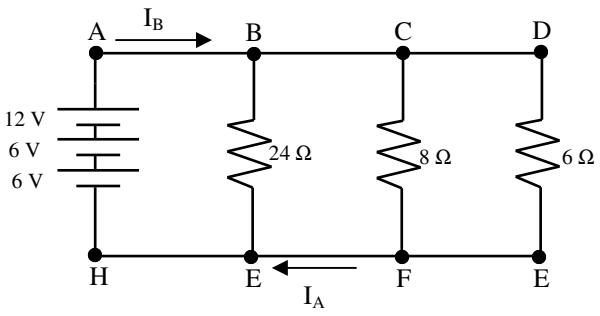


   A) $I_{\text{thru } 2\Omega} =$
   B) $I_{\text{thru batteries}} =$
   C) $V_{\text{used by } 5\Omega} =$
   D) $P_{\text{used by } 3\Omega} =$
   E) $V_{\text{at C}} =$
   F) $P_{\text{total}} =$
   G) If the 5Ω resistor is increased to a 10Ω resistor, what happens to the current?
   H) Which resistor uses the most voltage?
   I) Which resistor uses the most power?
   J) If they were light bulbs, which one would be the dimmest?

   K) In what situation could there be 0A flowing thru point D?

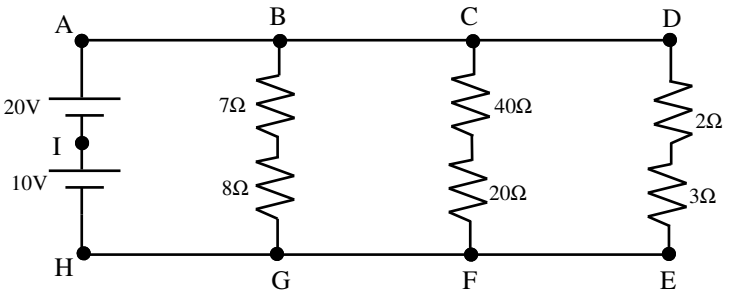
   L) The second battery is then replaced by a 9v battery (*so that there is less total voltage*). Which resistor would have the most current flowing thru it?

2. After working the circuit at the right, answer the following questions.



   A) $I_{\text{thru } 6\Omega} =$
   B) $I_{\text{thru batteries}} =$
   C) $V_{\text{used by } 24\Omega} =$
   D) $P_{\text{used by } 8\Omega} =$
   E) $V_{\text{at C}} =$
   F) $I_A =$
   G) $I_B =$
   H) $P_{\text{total}} =$
   I) Which resistor uses the most voltage?
   J) Which resistor allows the most current?
   K) Which resistor uses the most power?
   L) If they were light bulbs, which one would be the brightest?
   M) The 6 Ω is then replaced by a 12Ω resistor.
      i) The current flowing thru the 12Ω would increase or decrease?
      ii) The current flowing thru the 8Ω would increase or decrease?
      iii) The total current provided by the batteries would increase or decrease?
      iv) The voltage used by the new 12Ω would increase or decrease?

3. Answer the following questions about the circuit below.



   A) The 40Ω and 20Ω are in parallel or series which each other?
   B) $I_{\text{from F to G}} =$
   C) $I_{\text{Total}} =$
   D) $I_{\text{from C to D}} =$
   E) $V_{\text{from B to D}} =$
   F) $V_{\text{at F}} =$
   G) $V_{\text{used by the 2 } \Omega} =$
   H) $P_{\text{used by the 8 } \Omega} =$
   I) If the 20Ω resistor is changed to 10Ω,
      i) how does the current from B to G change?
      ii) how does the total current change?
   J) How much energy does the 8Ω resistor use in 20 seconds?
   K) What are the units for heat?
   L) How much energy does the 8Ω resistor dissipate in 20 seconds?

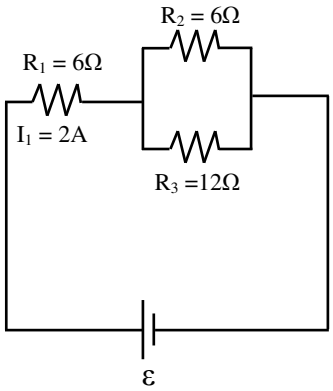
4. If your electric company were to sell electricity at a cost of 8 cents per kilowatt hour, how much would it cost to run a 400 W appliance for 3 hours?

5. Why is it that metals are good conductors. Also talk about them on an atomic or at least molecular level.

6. Using the electrical symbols, draw a diagram with two light bulbs, two batteries and a switch so that each of the light bulbs can be turned off independently.

7. In a circuit the words "potential difference" refers to what quantity?

8. Using the circuit at the right answer the following questions.



   A) Calculate the total equivalent resistance.

   B) Calculate the EMF of the battery.

   C) Calculate the power dissipated by the 12Ω resistor.

   D) If the three resistors were light bulbs, which one would be brightest? (*You must justify your answer.*)

   E) How many electrons travel thru R_1 in 10 seconds?