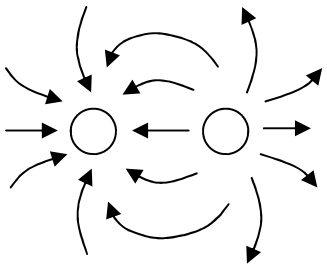
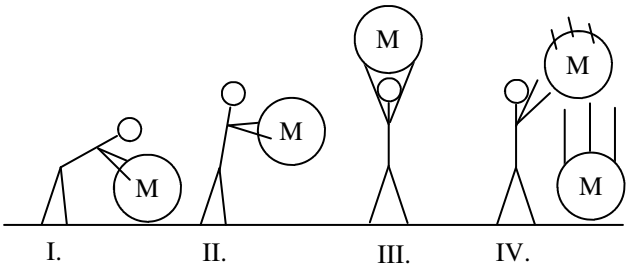
A-day: Due Wed., May 6
B-day: Due Thurs., May 7

2009 Electricity 11
Test Review

Name: _____

1. How does an object become positive?
2. How does an object become negative?
3. Identify the charges in the diagram at the right.





4. Slim Jim lifts an object above his head.
   A. Does the mass want to go down or up?
   B. When does Jim have to use a force: to move the object up or down?
   C. When does the object gain potential energy: when Jim uses a force or when he lets go?
   D. When the object is released, so that it is moving the way it wants to move, does it gain or lose potential energy?
   E. If the mass was a positive charge, the earth would have to be a _____ charge to pull the object down.

5. Use the same logic as before to answer the following about the two charges at the left.
   A. Do they feel an attractive or repulsive force?
   B. If released from this position, will they move toward or away from each other?
   C. To increase the potential energy of the two, would you move them closer together or farther apart?

For help with the following questions refer to Q5 on Electricity 2.

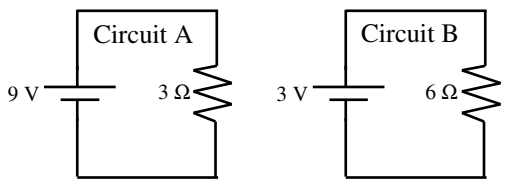
$$F_e = k_c \frac{q_1 q_2}{r^2}$$

6. How does the force change?
   A. If the distance between two charges is doubled?
   B. If the distance between two charges is tripled?
   C. If one of the charges is halved?
   D. If the distance between two charges is halved?
   E. If one of the charges is four times as big?

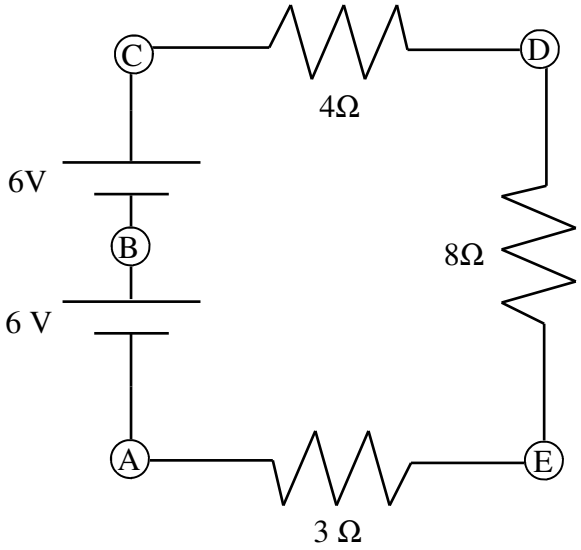
7. Does the resistance of the wire increase or decrease?
   A. If the wire is made shorter?
   B. If the wire is heated (becomes hotter)?
   C. If the wire is replaced with a thinner wire?
   D. If the voltage is increased?
   E. If the wire is replaced with a superconductor?

Superconductor—*a material that has zero resistance below a critical temperature. A superconductor has no resistance (none) when VERY cold (very far below 0ºC). We say that wires in circuits have no resistance, but they have some. And long wires (like power lines) have enough resistance to use up 40% of the power electric companies generate!*

8. Two cars are driving down the road. Car 1 is going very fast. Car 2 is moving slowly.
   A. Which one goes farther?
   B. Why?



9. (*Using the same logic.*)
   A. What is the current in circuit A?
   B. What is the current in circuit B?
   C. Which one moves more current thru the resistor?
   D. Which one moves more electrons (more charge)?



10. After working the circuit at the left, answer the following.
    A. Are the batteries in parallel or series?

    B. What is the total resistance (R_{total})?

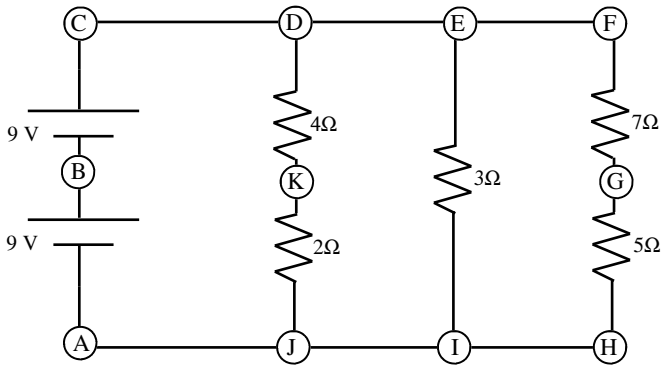
    C. What is the total current (I_{total})?

    D. How much voltage is used by the 8Ω resistor?

    E. How much power is used by the 4Ω resistor?

    F. What is the total power used by the circuit (P_{total})?

BIG NOTE: *We all know that the voltage at the bottom of the first battery (letter A above and below), is 0 volts. This is our reference point. When we say that point C above is 12 volts we actually mean: "12 volts above letter A". It is always the difference of voltage that matters. "$V_{A\ to\ C}$" means "what is the difference of voltage between points A and C".*



11. After working the circuit at the left, answer the following.
    A. V_{total} =
    B. $V_{at\ A}$ =
    C. $V_{at\ C}$ =
    D. $V_{at\ F}$ =
    E. $V_{C\ to\ F}$ = (The difference in voltage between C and F) =

    F. $I_{thru\ point\ K}$ =

    G. $I_{thru\ the\ 5\Omega\ resistor}$ =

    H. I from I to J =

    I. $V_{used\ by\ the\ 2\Omega\ resistor}$ =

    J. $P_{used\ by\ the\ 3\ \Omega\ resistor}$ =

    K. P_{total} =

Be sure to study the last few homework!!!

You will have to make a series and parallel circuit for your test. Come in early and practice, if you need to.

Important Study Helps:
Circuit Components (has real pictures)
Electric Field and Force
Understanding Circuits