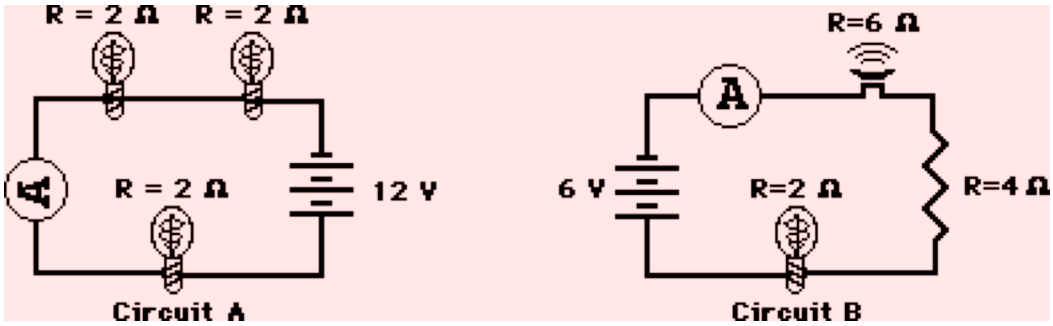
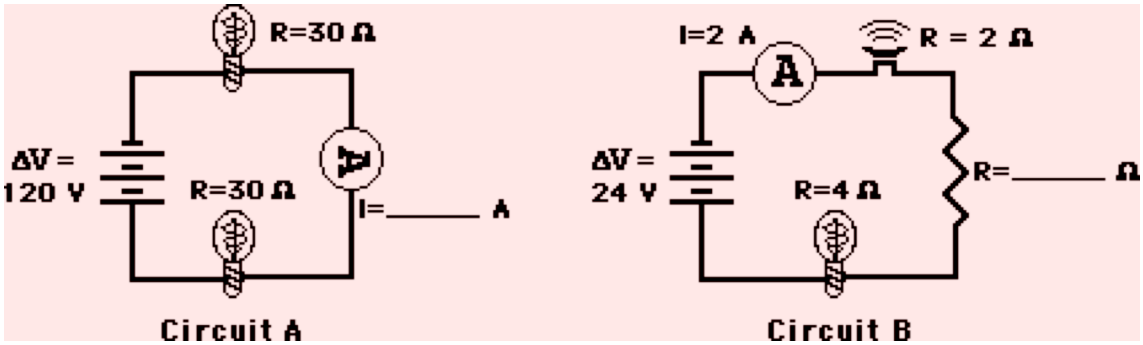
7. Analyze the following circuit and determine the equivalent or total resistance. Then determine the current at the ammeter location.

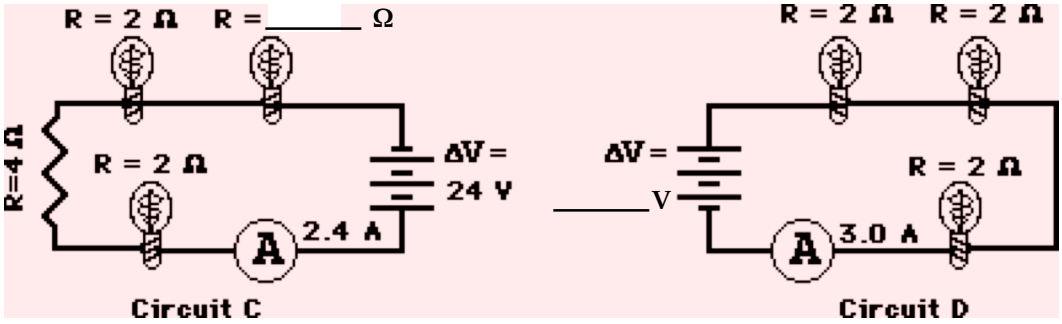


R_{tot} = _____ R_{tot} = _____

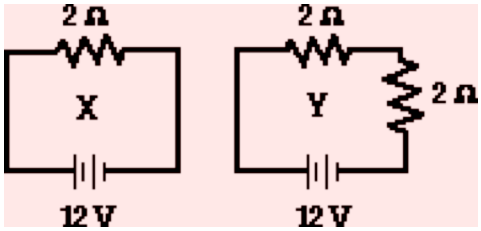
I = _____ I = _____

8. For the following diagrams, utilize the concept of equivalent resistance and Ohm's Law in order to fill in the blank.

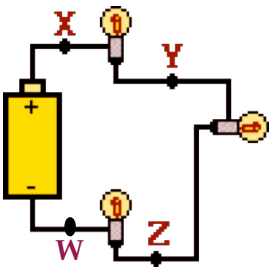




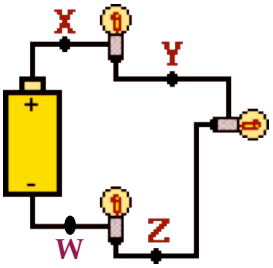
9. Compare circuits X and Y. Consider circuits X and Y below. Each circuit is powered by the same battery and contains identical resistors. Circuit X has one resistor and circuit Y has two resistors. The equivalent resistance of circuit X will be _____ (> or < or =) that of circuit Y. The current in the battery in X will be _____ (> or < or =) that in the battery in Y.



10. Three identical light bulbs are connected to a battery as shown below. Which adjustments could be made to the circuit that would increase the current being measured at X? Circle all that apply.
    a. Increase the resistance of one of the bulbs.
    b. Decrease the resistance of two of the bulbs.
    c. Increase the resistance of two of the bulbs.
    d. Decrease the voltage of the battery.
    e. Increase the voltage of the battery.
    f. Remove one of the bulbs (and re-connect the circuit).



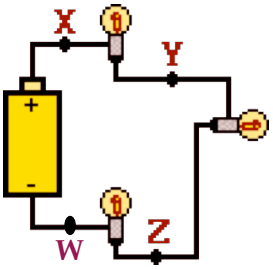
11. Three identical light bulbs are connected to a battery as shown below. W, X, Y and Z represent locations along the circuit. Which one of the following statements is true?



a. The potential difference between X and Y is greater than that between Y and Z.
b. The potential difference between X and Y is greater than that between Y and W.
c. The potential difference between Y and Z is greater than that between Y and W.
d. The potential difference between X and Z is greater than that between Z and W.
e. The potential difference between X and W is greater than that across the battery.
f. The potential difference between X and Y is greater than that between Z and W.

12. Three identical light bulbs are connected to a battery as shown below. Which one of the following statements is true?
    a. All three bulbs will have the same brightness.
    b. The bulb between X and Y will be the brightest.
    c. The bulb between Y and Z will be the brightest.
    d. The bulb between Z and the battery will be the brightest.

    Justify your answer to this question using the language of physics.



13. Compare a circuit with three light bulbs to a circuit with two light bulbs. All light bulbs are identical. In which circuit will the overall power be the greatest? Intelligently defend your answer.

