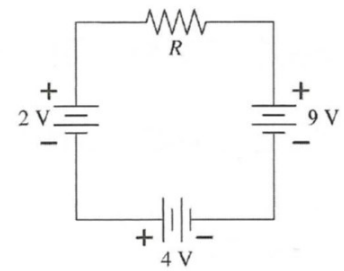


1.

a. In which direction does current flow through resistor R ?



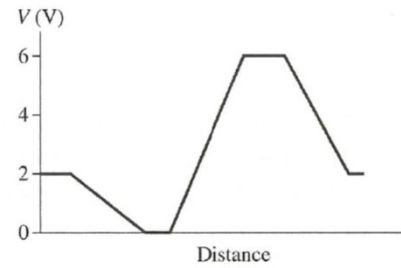
b. Which end of R is more positive? Explain.

c. If this circuit were analyzed in a clockwise direction, what numerical value would you assign to ΔV_{res} ? Why?

d. What value would ΔV_{res} have if the circuit were analyzed in a counterclockwise direction?

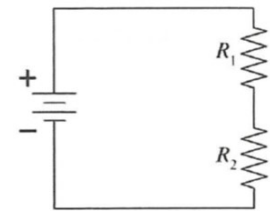
2.

The current in a circuit is 2.0 A. The graph shows how the potential changes when going around the circuit in a clockwise direction, starting from the lower left corner. Draw the circuit diagram.



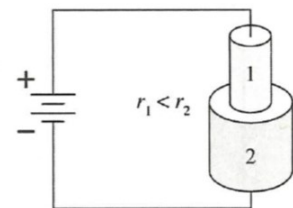
3.

This circuit has two resistors, with $R_1 > R_2$. Which of the two resistors dissipates the larger amount of power? Explain.



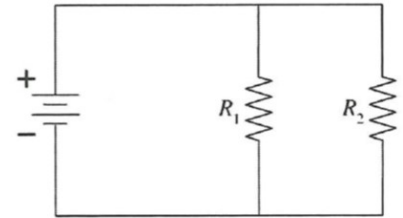
4.

Two conductors of equal lengths are connected to a battery by ideal wires. The conductors are made of the same material but have different radii r . Which of the two conductors dissipates the larger amount of power? Explain.



5.

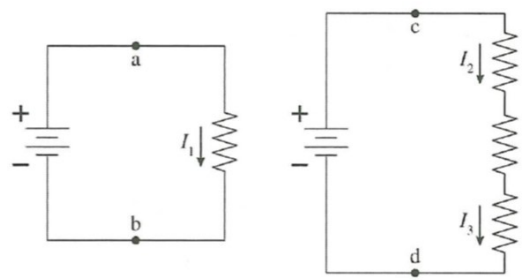
The circuit shown has a battery and two resistors, with $R_1 > R_2$. Which of the two resistors dissipates the larger amount of power? Explain your reasoning.



6.

The figure shows two circuits. The two ideal batteries are identical and the four resistors all have exactly the same resistance.

a. Is ΔV_{ab} larger than, smaller than, or equal to ΔV_{cd} ? Explain.



b. Rank in order, from largest to smallest, the currents I_1 , I_2 , and I_3 .

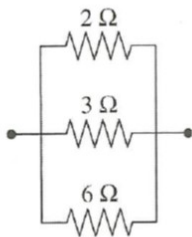
Order:

Explanation:

7.

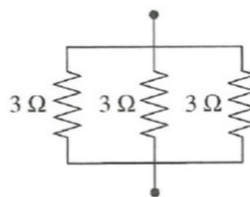
What is the equivalent resistance of each group of resistors?

a.



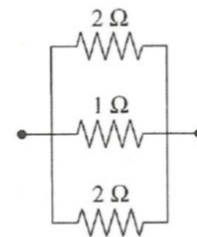
$R_{eq} =$ _____

b.



$R_{eq} =$ _____

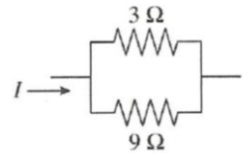
c.



$R_{eq} =$ _____

8.

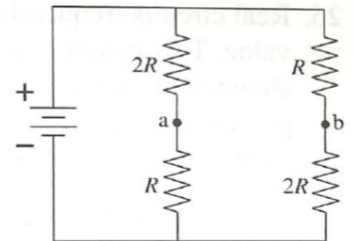
a. What fraction of current I goes through the $3\ \Omega$ resistor?



b. If the $9\ \Omega$ resistor is replaced with a larger resistor, will the fraction of current going through the $3\ \Omega$ resistor increase, decrease, or stay the same?

9.

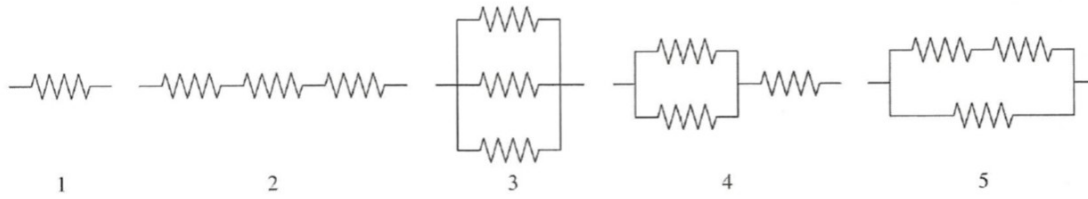
a. Consider the points a and b. Is the potential difference $\Delta V_{ab} = 0$? If so, why? If not, which point is more positive?



b. If a wire is connected between points a and b, does a current flow through it? If so, in which direction—to the right or to the left? Explain.

10.

The figure shows five combinations of identical resistors. Rank in order, from largest to smallest, the equivalent resistances $(R_{eq})_1$ to $(R_{eq})_5$.



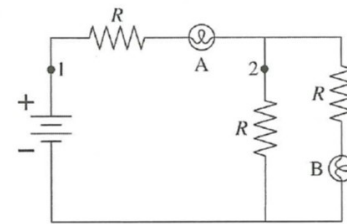
Order:

Explanation:

11.

Bulbs A and B are identical. Initially both are glowing.

a. Bulb A is removed from its socket. What happens to bulb B? Does it get brighter, stay the same, get dimmer, or go out? Explain.



b. Bulb A is replaced. Bulb B is then removed from its socket. What happens to bulb A? Does it get brighter, stay the same, get dimmer, or go out? Explain.

c. The circuit is restored to its initial condition. A wire is then connected between points 1 and 2. What happens to the brightness of each bulb?