Name _____ Date _____ Period _____

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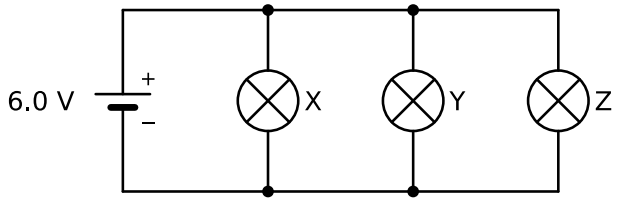
Parallel Circuits

Physics

Part A: Concepts

1. Three identical bulbs X, Y, and Z are connected in parallel to a 6.0 V battery.



a. What is the voltage across each bulb? Explain.

b. Bulb Y burns out. What happens to bulbs X and Z? Explain.

c. A fourth identical bulb is added on a new branch. What happens to the total resistance, the total current from the battery, and the brightness of X?

Part B: Solving Parallel Circuits

Show your equations, substitutions, and answers with units.

2. A 10. Ω resistor and a 15 Ω resistor are connected in parallel. Find their total resistance. Explain why your answer must be less than 10. Ω.

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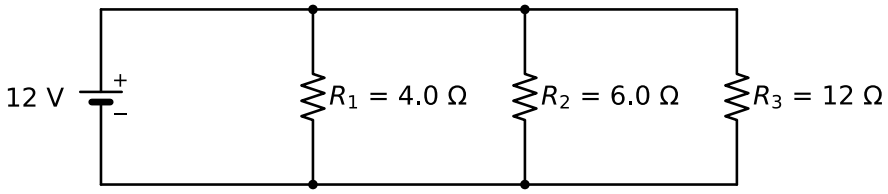
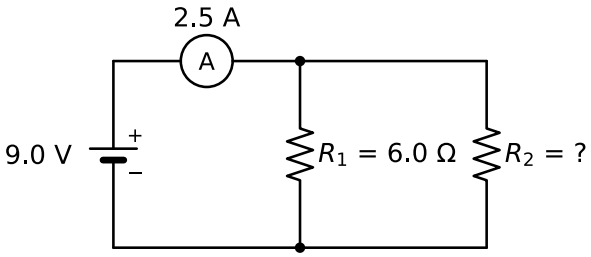
3. For the circuit shown, find the current in each branch, the total current, and the total resistance.



4. The ammeter on the main wire reads 2.5 A. Find the current through R_1, the current through R_2, and the resistance R_2.



5. A 120 V kitchen circuit has a 20. A breaker. A 12 Ω coffee maker, a 20. Ω blender, and a 24 Ω toaster are all plugged in and turned on at the same time.

a. Find the current through each appliance.

b. Will the breaker trip? Show how you know.

c. Which one appliance should be unplugged to lower the total current the most? What is the new total current?

d. Why are homes wired in parallel instead of series?

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