Series and Parallel A Name_____

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1. A 7 ohm resistor and a 5 ohm resistor are connected in series with a battery. The potential difference across the 5 ohm resistor is measured as 15V. Find the potential difference across the battery.

2. A 9.0 ohm resistor and a 6.0 ohm resistor are connected in parallel to a battery, and the current in the 9.0 ohm resistor is found to be 2 A. Find the potential difference across the battery.

3. A 9.0 ohm resistor and a 6.0 ohm resistor are connected in series to a battery, and the current through the 9.0 ohm resistor is 2 A. What is the potential difference across the battery?

4. A toaster is rated at 1000W, and a grill is rated at 1200W. Can I use both at the same time on a single 120V circuit protected with a 20A breaker?

5. You can obtain only four 20 ohm resistors from the stock room. How can you achieve a resistance of 30 ohms?

Answers to Part B

1. 45 V
2. 96 V
3. 4 A
4. Connect four 20 ohm resistors in parallel for a resistance of 5 ohms, then connect a 20 ohm resistor in series with those.
5. Yes

Series and Parallel B Name_____

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1. A 9.0 ohm resistor and a 6.0 ohm resistor are connected in series with an emf source (like a battery, but maybe fed from the power grid). The potential difference across the 6.0 ohm resistor is measured with a voltmeter to be 18 V. Find the potential difference across the emf source.

2. An 12 ohm, 9 ohm, and 3 ohm resistor are connected in series with an emf(voltage) source. The current in the 12 ohm resistor is measured to be 4 A. Find the potential difference across the emf(voltage) source.

3. A 12 ohm resistor is connected in parallel to a 6 ohm resistor. These are joined in series to a 5 ohm resistor and a source with a potential difference of 36V. Calculate the current drawn from the source.

4. You can obtain only five 20 ohm resistors from the stock room. How can you achieve a resistance of 25 ohms?

5. Your toaster and space heater each dissipate 800W of power. Can you operate both of these appliances at the same time if the 120V line you use is your kitchen has a circuit breaker rated at 15A?

Answers to A

1. 36V
2. 18V
3. 30V
4. Yes
5. Connect two 20 ohm resistors in parallel for an equivalent resistance of 10 ohms, and then connect a 20 ohm resistor in series for 30 ohms.