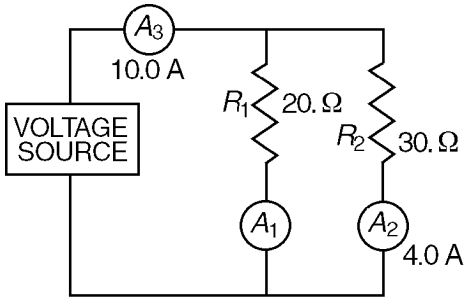
Name: _____

Parallel Circuits Worksheet

Show all work (including equations, substitutions and units) for full credit.

Questions 1 and 2 refer to the following:

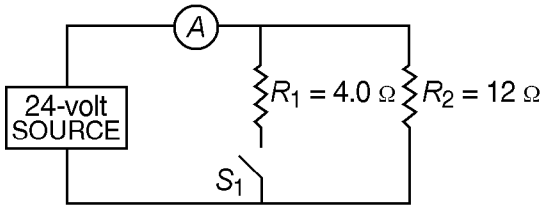
The diagram below shows two resistors and three ammeters connected to a voltage source.



1) What is the potential difference across the source in the circuit shown?

2) What is the current reading of ammeter A_1 in the circuit shown?

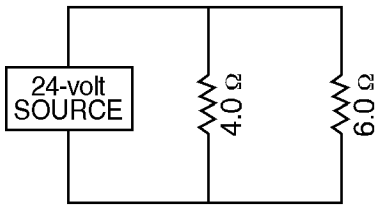
Questions 3 and 4 refer to the following:



3) If switch S_1 in the given diagram is open, the reading of ammeter A is

4) If switch S_1 in the given diagram is closed, the equivalent resistance of the circuit is

5) The circuit diagram below shows two resistors connected to a 24-volt source of potential difference.



What is the total resistance of the circuit shown in the diagram?

6) An 18-ohm resistor and a 36-ohm resistor are connected in parallel with a 24-volt battery. A single ammeter is placed in the circuit to read its total current.

Draw a diagram of the circuit described using symbols from the *Circuit Symbols* physics reference table. [*Assume the availability of any number of wires of negligible resistance.*]

7) You are given a 12-volt battery, ammeter *A*, voltmeter *V*, resistor R_1, and resistor R_2. Resistor R_2 has a value of 3.0 ohms.

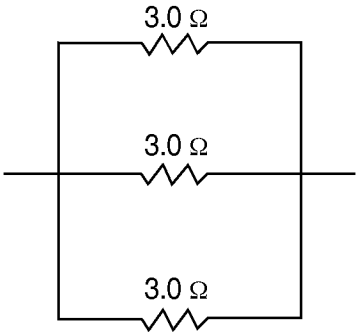
(a) Using appropriate symbols from the *Circuit Symbols* physics reference table, draw and label a complete circuit showing:

- resistors R_1 and R_2 connected in parallel with the battery
- the ammeter connected to measure the current through resistor R_1, only
- the voltmeter connected to measure the potential drop across resistor R_1

(b) If the total current in the circuit is 6.0 amperes, determine the equivalent resistance of the circuit.

(c) If the total current in the circuit is 6.0 amperes, determine the resistance of resistor R_1. [*Show all calculations, including the equation and substitution with units.*]

8) What is the total resistance of the circuit segment shown in the diagram below?

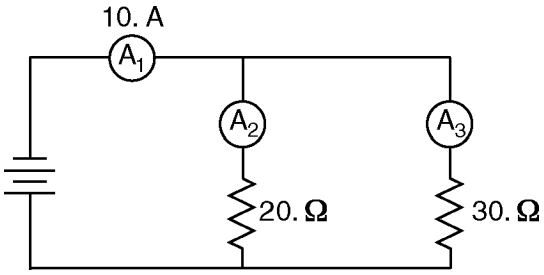


A) 27 Ω B) 1.0 Ω C) 3.0 Ω D) 9.0 Ω

9) If a 15-ohm resistor is connected in parallel with a 30.-ohm resistor, what is the equivalent resistance?

A) 10. Ω B) 15 Ω C) 45 Ω D) 2.0 Ω

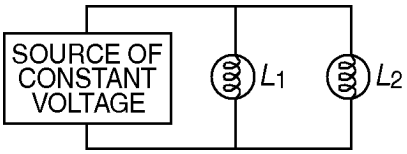
10) In the circuit diagram shown below, ammeter A_1 reads 10. amperes.



What is the reading of ammeter A_2?

A) 4.0 A B) 20. A C) 10. A D) 6.0 A

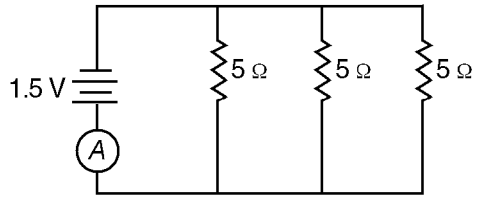
11) In the diagram below, lamps L_1 and L_2 are connected to a constant voltage power supply.

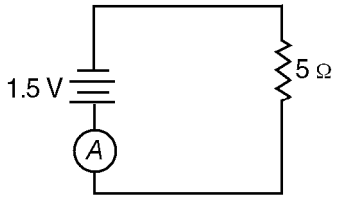


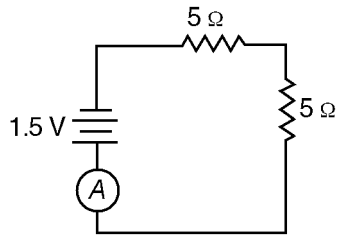
If lamp L_1 burns out, the brightness of L_2 will

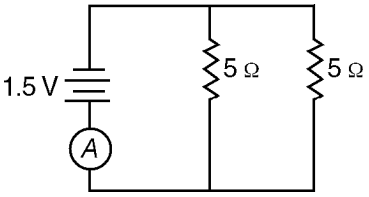
A) increase B) decrease C) remain the same

12) In which circuit would ammeter *A* show the *greatest* current?

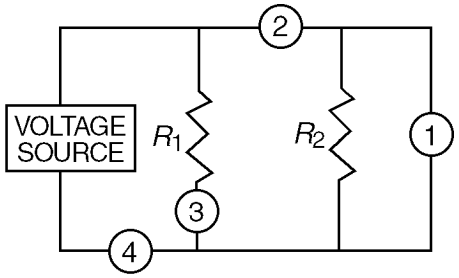
A) 

C) 

B) 

D) 

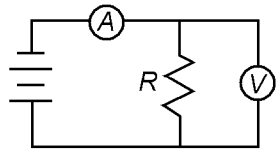
13) Two resistors are connected to a source of voltage as shown in the diagram below.

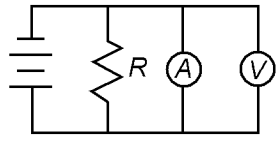


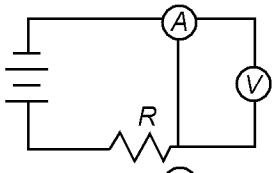
At which position should an ammeter be placed to measure the current passing only through resistor R_1?

A) 1 B) 2 C) 3 D) 4

14) Which circuit diagram below correctly shows the connection of ammeter *A* and voltmeter *V* to measure the current through and potential difference across resistor *R*?

A) 

B) 

C) 

D)