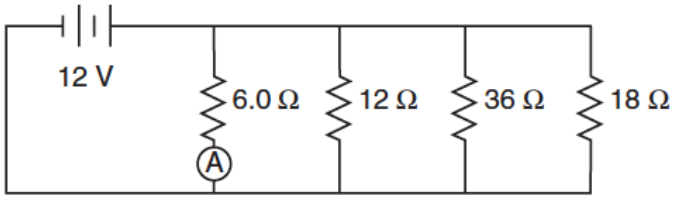
STUDENT NAME……..…….……Period……..…Date:.....
SPS22H: HONORS PHYSICS
Dr. Majewski

HOMEWORK # 8 Circuit Analysis

Base your answers to questions 1 through 3 on the diagram below, which represents an electrical circuit consisting of four resistors and a 12-volt battery.



1. What is the current measured by ammeter A?

   Equations:…… ….……

   Substitution of Values with Units:……..…

   Answers with Units:……..

2. What is the equivalent resistance of this circuit?

   Equations:…… ….……

   Substitution of Values with Units:……..…

   Answers with Units:……..

3. How much power is dissipated in the 36-ohm resistor?

   Equations:…… ….……

   Substitution of Values with Units:……..…

   Answers with Units:……..

4. Three resistors, 4 ohms, 6 ohms, and 8 ohms, are connected in parallel in an electric circuit. The equivalent resistance of the circuit is
   a) less than 4 ohms
   b) between 4 ohms and 8 ohms
   c) between 10 ohms and 18 ohms
   d) 18 ohms

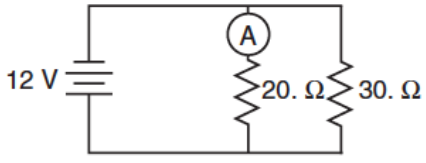
5. A simple circuit consists of a 100-ohm resistor connected to a battery. A 25-ohm resistor is to be connected in the circuit. Determine the smallest equivalent resistance possible when both resistors are connected to the battery.

   Equations:…… ….……

   Substitution of Values with Units:……..…

   Answers with Units:……..

Base your answers to questions 6 through 8 on the information and diagram below.
A 20-ohm resistor and a 30-ohm resistor are connected in parallel to a 12-volt battery as shown. An ammeter is connected as shown.



6. What is the equivalent resistance of the circuit?

   Equations:…… ……

   Substitution of Values with Units:……..…

   Answers with Units:……..

7. What is the current reading of the ammeter?

   Equations:…… ……

   Substitution of Values with Units:……..…

   Answers with Units:……..

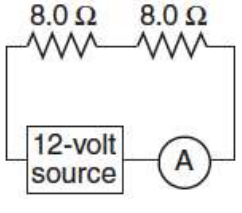
8. What is the power of the 30-ohm resistor?

   Equations:…… ……

   Substitution of Values with Units:……..…

   Answers with Units:……..

9. The diagram below shows a circuit with two resistors.



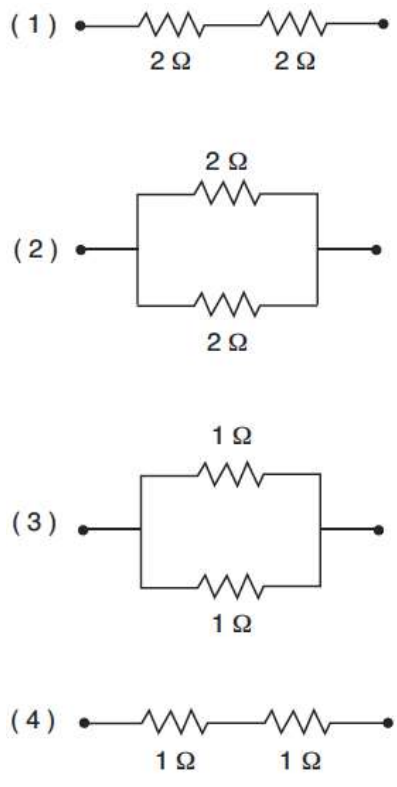
   What is the reading on ammeter A?

   Equations:…… ……

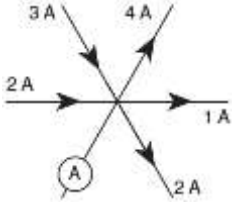
   Substitution of Values with Units:……..…

   Answers with Units:……..

10. Which combination of resistors has the smallest equivalent resistance?



11. The diagram below represents currents in a segment of an electric circuit.



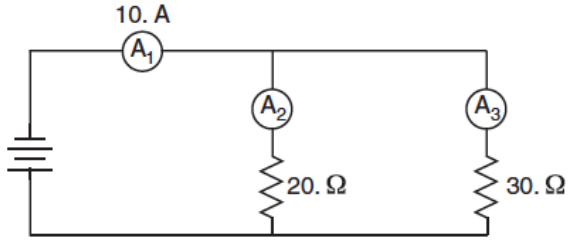
What is the reading of ammeter A?

Equations:…… ……

Substitution of Values with Units:……

Answers with Units:…….

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



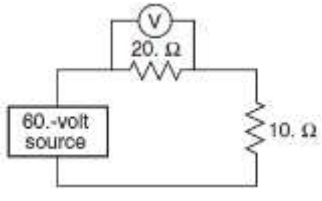
What is the reading of ammeter A2?

Equations:…… ….……

Substitution of Values with Units:……..…

Answers with Units:……..

13. In the circuit represented by the diagram below, what is the reading of voltmeter V?

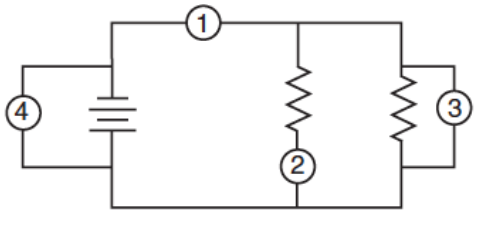


Equations:…… ….……

Substitution of Values with Units:……..…

Answers with Units:……..

14. In the electric circuit diagram below, possible locations of an ammeter and a voltmeter are indicated by circles 1,2, 3, and 4.



Where should an ammeter be located to correctly measure the total current and where should a voltmeter be located to correctly measure the total voltage?

a) ammeter at 1 and voltmeter at 4
b) ammeter at 2 and voltmeter at 3
c) ammeter at 3 and voltmeter at 4
d) ammeter at 1 and voltmeter at 2

Base your answers to questions 15 and 16 on the information below.

A 15-ohm resistor and a 20-ohm resistor are connected in parallel with a 9-volt battery. A single ammeter is connected to measure the total current of the circuit.

15. Draw a diagram of this circuit using standard circuit schematic symbols.
    (Use an edge for drawing, e.g. ruler or metro card or ID card. Drawing without an edge will not be accepted.)

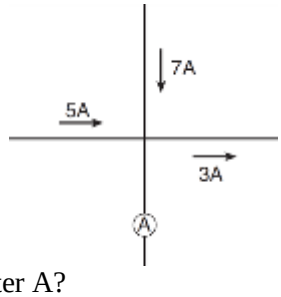
16. Calculate the equivalent resistance of the circuit.

    Equations:…… ….……

    Substitution of Values with Units:……..…

    Answers with Units:…….

17. The diagram below shows currents in a segment of an electric circuit.



What is the reading of ammeter A?

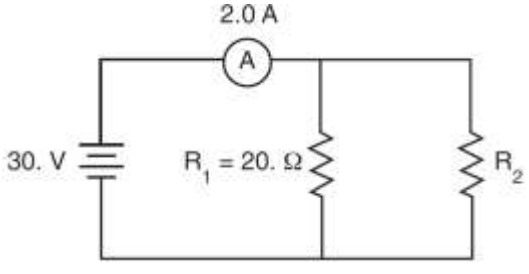
Equations:…… ….……

Substitution of Values with Units:……..…

Answers with Units:……..

Base your answers to questions 18 and 19 on the information below.

A 20-ohm resistor, R_1, and a resistor of unknown resistance, R_2, are connected in parallel to a 30-volt source, as shown in the circuit diagram below. An ammeter in the circuit reads 2.0 amperes.



18. Determine the equivalent resistance of the circuit.

Equations:…… ….……

Substitution of Values with Units:……..…

Answers with Units:……..

19. Calculate the resistance of resistor R_2.

Equations:…… ….……

Substitution of Values with Units:……..…

Answers with Units:……..