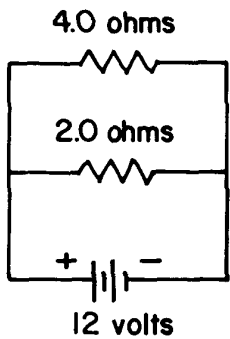1. In a simple electric circuit, a 24-ohm resistor is connected across a 6.0-volt battery. What is the current in the circuit?

   A) 0.25 A   B) 1.0 A
   C) 4.0 A   D) 140 A

2. In the circuit shown at the right, the potential difference across the 4.0-ohm resistor is

   A) 6.0 volts   B) 2.0 volts
   C) 3.0 volts   D) 12 volts

3. An electric circuit consists of a variable resistor connected to a source of constant potential difference. If the resistance of the resistor is doubled, the current through the resistor is

   A) halved   B) doubled
   C) quartered   D) quadrupled

4. How much time is required for an operating 100-watt light bulb to dissipate 10 joules of electrical energy?

   A) 1 s   B) 0.1 s
   C) 10 s   D) 1000 s

5. A charge of 30. coulombs passes through a 24-ohm resistor in 6.0 seconds. What is the current through the resistor?

   A) 5.0 A   B) 7.5 A   C) 1.3 A   D) 4.0 A

6. An electrical appliance draws 9.0 amperes of current when connected to a 120-volt source of potential difference. What is the total amount of power dissipated by this appliance?
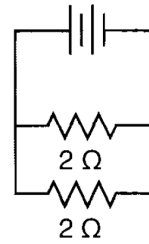
   A) 1100 W   B) 130 W
   C) 110 W   D) 13 W

7. A 20.-ohm resistor has 40. coulombs passing through it in 5.0 seconds. The potential difference across the resistor is
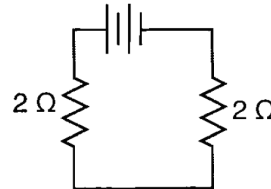
   A) 160 V   B) 200 V   C) 8.0 V   D) 100 V

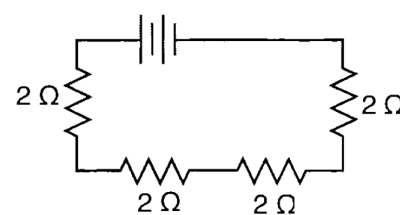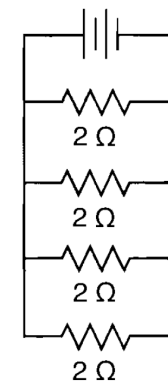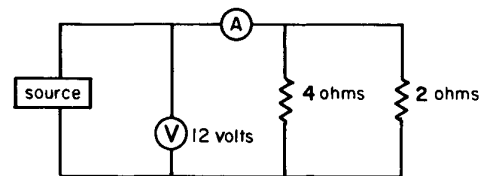8. Which circuit has the *smallest* equivalent resistance?

9. Base your answer to the following question on the diagram below which represents an electric circuit. The voltmeter, V, reads 12 volts.

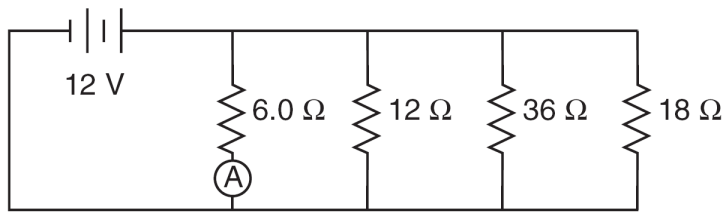   Ammeter *A* should read

   A) 6 A   B) 2 A   C) 3 A   D) 9 A

10. Charge flowing at the rate of 2.50×10^{16} elementary charges per second is equivalent to a current of

    A) 2.50×10^{13} A   B) 2.50×10^{-3} A
    C) 4.00×10^{-3} A   D) 6.25×10^{5} A

Base your answers to questions **11** and **12** on the diagram below, which represents an electric circuit consisting of four resistors and a 12-volt battery.
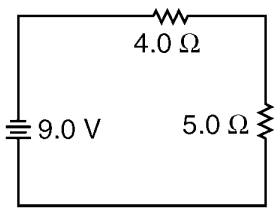

12 V   6.0 Ω   12 Ω   36 Ω   18 Ω   (A)

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

A) 48 W   B) 4.0 W   C) 3.0 W   D) 110 W

12. What is the current measured by ammeter A?
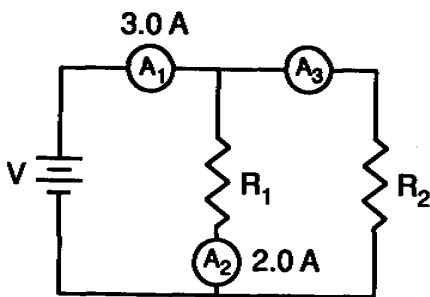
A) 2.0 A   B) 72 A   C) 0.50 A   D) 4.0 A

13. A 9.0-volt battery is connected to a 4.0-ohm resistor and a 5.0-ohm resistor as shown in the diagram below.

4.0 Ω

9.0 V   5.0 Ω

What is the current in the 5.0-ohm resistor?
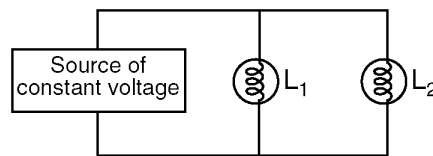
A) 4.0 A   B) 1.8 A   C) 1.0 A   D) 2.3 A

14. Ammeters A_1, A_2 and A_3 are placed in a circuit as shown below.

3.0 A

A_1 A_3

V R_1 R_2

A_2 2.0 A

What is the reading on ammeter A_3?

A) 1.0 A   B) 2.0 A   C) 3.0 A   D) 5.0 A

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

Source of constant voltage L_1 L_2

If lamp L_1 burns out, the brightness of L_2 will

A) remain the same   B) increase
C) decrease

16. The diagram below represents part of an electric circuit containing three resistors.

3.0 Ω

4.0 Ω

12 Ω
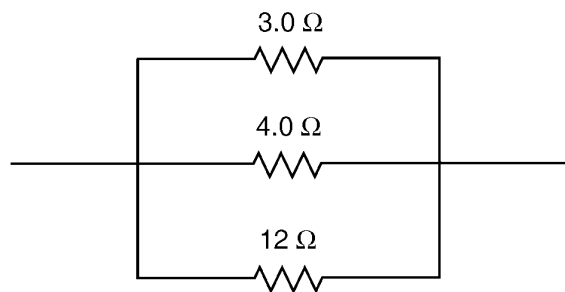
What is the equivalent resistance of this part of the circuit?

A) 1.5 Ω   B) 0.67 Ω
C) 6.3 Ω   D) 19 Ω

Version 1

17. The graph below represents the relationship between the current in a metallic conductor and the potential difference across the conductor at constant temperature.

Current vs. Potential Difference
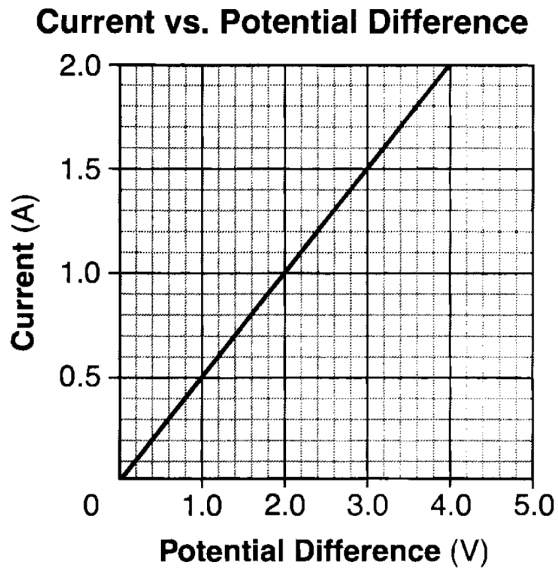
The resistance of the conductor is
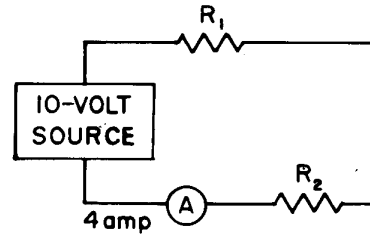
A) 2.0 Ψ   B) 0.50 Ψ
C) 1.0 Ψ   D) 4.0 Ψ

18. The diagram below shows a circuit with three resistors.
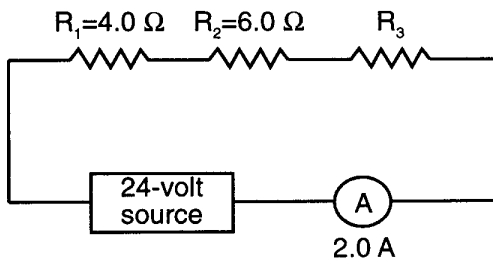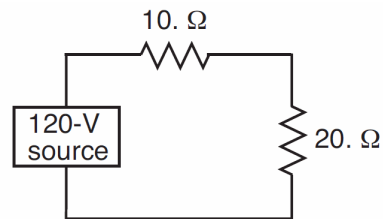

What is the resistance of resistor R_3?

A) 6.0 Ω B) 2.0 Ω C) 12 Ω D) 4.0 Ω

19. Base your answer to the following question on the circuit diagram below.

The voltage drop at R_1 will be

A) 20 volts   B) less than 10 volts
C) 10 volts   D) more than 20 volts

20. The diagram below represents a circuit consisting of two resistors connected to a source of potential difference.

What is the current through the 20.-ohm resistor?

A) 0.25 A   B) 6.0 A
C) 12 A   D) 4.0 A

Version 1