

Calculating Current

Answer the following questions by:

- Identifying the variables you have
- Identify the variable you are missing
- Use the formula to find your missing variable.

1. Find the charge that flows through an electric iron in 10 seconds if the iron has a current rating of 6A.

$$I = 6A$$

$$T = 10s$$

$$Q = x$$

$$6A = X / 10s$$

$$X = 60 C$$

2. A 110 V heating element in an electrical water heater is rated at 20 amperes. Find the charge that passes through the element in 10 seconds.

$$I = 20 A$$

$$T = 10s$$

$$Q = X$$

$$20A = X / 10s$$

$$X = 200 C$$

We ignore volts here, it is unnecessary information!

3. A calculator display has 3×10^{-2} coulombs of charge pass through it in 10 seconds. Find the current in milliamperes

$$I = x$$

$$Q = 3 \times 10^{-2} C \text{ or } 0.03 C$$

$$T = 10s$$

$$X = 0.03C / 10s$$

$$X = 0.003 A$$

4. In an electric motor operating at a constant speed, 30 000 coulombs of charge have moved through the motor. The motor is drawing a steady current of 50 amperes. Find the length of time the motor operated at constant speed.

$$I = 50 A$$

$$Q = 30\,000C$$

$$T = X$$

$$50A = 30\,000 C / x$$

$$x = 600s$$

5. If 15 C of charge flows through a conductor in two minutes, what is the current?

$$I = x$$

$$Q = 15 C$$

$$T = 2 \text{ min} = 2 \times 60s = 120 s$$

$$x = 15C / 120s$$

$$x = 0.125 A$$