

1-11 SQUARE ROOT

The *square root* of a number is the opposite of squaring a number. For all practical purposes, you must use a calculator with a square root key to determine the square root of a number. For an electrician's exam, the only square root number you need to know is the square root of three ($\sqrt{3}$), which is 1.732. To multiply, divide, add, or subtract a number by a square root value, determine the square root value first, then perform the math function.

Step 1: Enter the number in a calculator.

Step 2: Press the $\sqrt{}$ key of the calculator.

PART B – BASIC ELECTRICAL FORMULAS

1-12 ELECTRICAL CIRCUIT

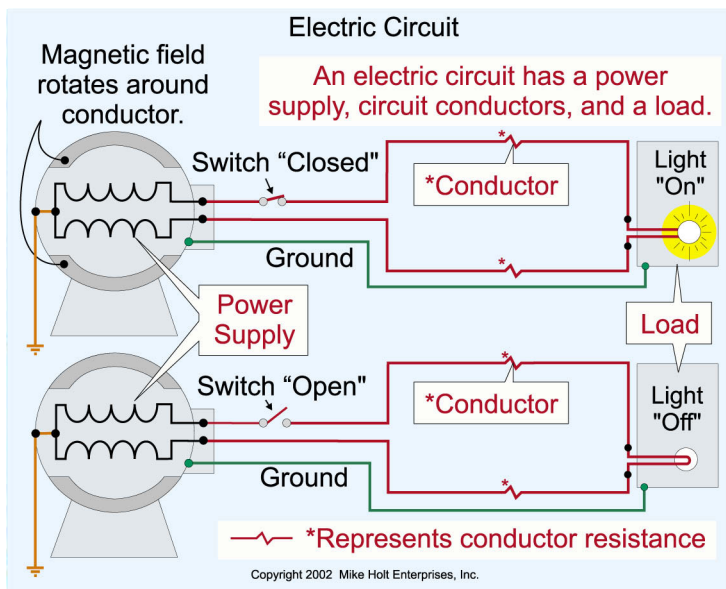
An electric circuit consists of power source, conductors, and load. For current to travel in the circuit, there must be a complete path from one terminal of the power supply, through the conductors and the load, back to the other terminal of the power supply. Figure 1-1.

1-14 POWER SOURCE

In any completed circuit, it takes a force to push the electrons through the power source, conductor, and load. The two types of electric current are *direct current (dc)* and *alternating current (ac)*.

Direct Current

The polarity from direct-current power sources never changes; that is, the current flows out of the negative terminal of the power source in the same direction. When the power supply is a *battery*, the polarity and the voltage magnitude remain the same.

**Figure 1-1**

Alternating Current

Alternating-current power sources produce a voltage and current that has a constant change in polarity and magnitude at a constant frequency. Alternating-current flow is produced by a *generator* or an *alternator*.

1-15 CONDUCTANCE AND RESISTANCE

Conductance

Conductance is the property of metal that permits current to flow. The best conductors, in order of their conductivity are: silver, copper, gold, and aluminum. Although silver is a better conductor of electricity than copper, copper is used most widely because it is less expensive.