

Figure 3-13 Figure for Probs. 3-11 to 3-15.

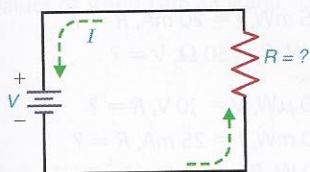
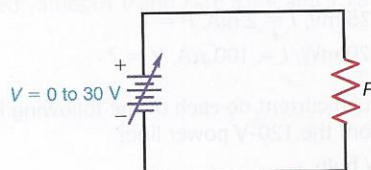


Figure 3-14 Circuit diagram for Prob. 3-21.



3-8 **MultiSim** a. $I = 0.05 \text{ A}$, $R = 1200 \Omega$, $V = ?$

b. $I = 0.2 \text{ A}$, $R = 470 \Omega$, $V = ?$

c. $I = 0.01 \text{ A}$, $R = 15,000 \Omega$, $V = ?$

d. $I = 0.006 \text{ A}$, $R = 2200 \Omega$, $V = ?$

3-9 How much voltage is developed across a $1000\text{-}\Omega$ resistor if it has a current of 0.01 A ?

3-10 A lightbulb drawing 1.25 A of current has a resistance of 96Ω . How much is the voltage across the lightbulb?

SECTION 3-3 THE RESISTANCE $R = V/I$

In Probs. 3-11 to 3-15, solve for the resistance, R , when V and I are known. As a visual aid, it may be helpful to insert the values of V and I into Fig. 3-13 when solving for R .

3-11 a. $V = 14 \text{ V}$, $I = 2 \text{ A}$, $R = ?$

b. $V = 25 \text{ V}$, $I = 5 \text{ A}$, $R = ?$

c. $V = 6 \text{ V}$, $I = 1.5 \text{ A}$, $R = ?$

d. $V = 24 \text{ V}$, $I = 4 \text{ A}$, $R = ?$

3-12 a. $V = 36 \text{ V}$, $I = 9 \text{ A}$, $R = ?$

b. $V = 45 \text{ V}$, $I = 5 \text{ A}$, $R = ?$

c. $V = 100 \text{ V}$, $I = 2 \text{ A}$, $R = ?$

d. $V = 240 \text{ V}$, $I = 20 \text{ A}$, $R = ?$

3-13 a. $V = 12 \text{ V}$, $I = 0.002 \text{ A}$, $R = ?$

b. $V = 16 \text{ V}$, $I = 0.08 \text{ A}$, $R = ?$

c. $V = 50 \text{ V}$, $I = 0.02 \text{ A}$, $R = ?$

d. $V = 45 \text{ V}$, $I = 0.009 \text{ A}$, $R = ?$

3-14 How much is the resistance of a motor if it draws 2 A of current from the 120-V power line?

3-15 If a CD player draws 1.6 A of current from a 13.6-Vdc source, how much is its resistance?

SECTION 3-5 MULTIPLE AND SUBMULTIPLE UNITS

In Probs. 3-16 to 3-20, solve for the unknowns listed. As a visual aid, it may be helpful to insert the known values of I , V , or R into Figs. 3-11, 3-12, or 3-13 when solving for the unknown quantity.

3-16 a. $V = 10 \text{ V}$, $R = 100 \text{ k}\Omega$, $I = ?$

b. $V = 15 \text{ V}$, $R = 2 \text{ k}\Omega$, $I = ?$

c. $I = 200 \mu\text{A}$, $R = 3.3 \text{ M}\Omega$, $V = ?$

d. $V = 5.4 \text{ V}$, $I = 2 \text{ mA}$, $R = ?$

3-17 a. $V = 120 \text{ V}$, $R = 1.5 \text{ k}\Omega$, $I = ?$

b. $I = 50 \mu\text{A}$, $R = 390 \text{ k}\Omega$, $V = ?$

c. $I = 2.5 \text{ mA}$, $R = 1.2 \text{ k}\Omega$, $V = ?$

d. $V = 99 \text{ V}$, $I = 3 \text{ mA}$, $R = ?$

3-18 a. $V = 24 \text{ V}$, $I = 800 \mu\text{A}$, $R = ?$

b. $V = 160 \text{ mV}$, $I = 8 \mu\text{A}$, $R = ?$

c. $V = 13.5 \text{ V}$, $R = 300 \Omega$, $I = ?$

d. $I = 30 \text{ mA}$, $R = 1.8 \text{ k}\Omega$, $V = ?$

3-19 How much is the current, I , in a $470\text{-k}\Omega$ resistor if its voltage is 23.5 V ?

3-20 How much voltage will be dropped across a $40\text{-k}\Omega$ resistance whose current is $250 \mu\text{A}$?

SECTION 3-6 THE LINEAR PROPORTION BETWEEN V AND I

3-21 Refer to Fig. 3-14. Draw a graph of the I and V values if (a) $R = 2.5 \Omega$; (b) $R = 5 \Omega$; (c) $R = 10 \Omega$. In each case, the voltage source is to be varied in 5-V steps from 0 to 30 V .

3-22 Refer to Fig. 3-15. Draw a graph of the I and R values when R is varied in $2\text{-}\Omega$ steps from 2 to 12Ω . (V is constant at 12 V .)

SECTION 3-7 ELECTRIC POWER

In Probs. 3-23 to 3-31, solve for the unknowns listed.

3-23 a. $V = 120 \text{ V}$, $I = 12.5 \text{ A}$, $P = ?$

b. $V = 120 \text{ V}$, $I = 625 \text{ mA}$, $P = ?$

c. $P = 1.2 \text{ kW}$, $V = 120 \text{ V}$, $I = ?$

d. $P = 100 \text{ W}$, $I = 8.33 \text{ A}$, $V = ?$

3-24 a. $V = 24 \text{ V}$, $I = 25 \text{ mA}$, $P = ?$

b. $P = 6 \text{ W}$, $V = 12 \text{ V}$, $I = ?$

c. $P = 10 \text{ W}$, $I = 100 \text{ mA}$, $V = ?$

d. $P = 50 \text{ W}$, $V = 9 \text{ V}$, $I = ?$

Figure 3-15 Circuit diagram for Prob. 3-22.

