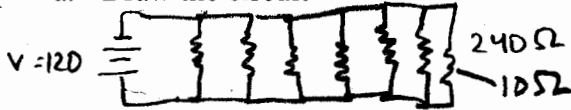


# Review 34-35c

1. A circuit contains six 240 ohm lamps, 60 W bulbs in the lamps and a 10 ohm heater connected in parallel. The voltage across the circuit is 120 V. What is the current in the circuit when:

a. Draw the circuit



b. Four lamps are turned on

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} = R = 59.88\Omega$$

$$I = \frac{V}{R} = \frac{120}{59.88} = \boxed{2 \text{ Amp}}$$

c. When all lamps are on

$$R = 40\Omega \quad I = \frac{V}{R} = \frac{120V}{40\Omega} = \boxed{3 \text{ AMP}}$$

d. If six lamps and the heater are operating

$$\frac{1}{R} = \frac{1}{240} + \frac{1}{240} + \frac{1}{240} + \frac{1}{240} + \frac{1}{240} + \frac{1}{240} + \frac{1}{10} = R = 812.5 \quad I = \frac{V}{R} = \frac{120}{812.5} = \boxed{15 \text{ Amp}}$$

2. A circuit contains three resistors of 30 ohms in parallel with one 10 ohm resistor in series. The voltage is 45 V.

a. Draw the circuit



b. Determine the current

$$\frac{1}{R} = \frac{1}{30} + \frac{1}{30} + \frac{1}{30} \quad R_p = 10$$

$$R_s = 10 + 10 = 20\Omega \quad I = \frac{V}{R} = \frac{45}{20} = \boxed{2.25A}$$

c. Determine the voltage across the 10 ohm resistor

$$R = \frac{V}{I} \quad V = (10\Omega) 2.25A = \boxed{2.25 \times 10^1 V}$$

3. A home circuit contains a line out with a resistance of 0.25 ohms a kitchen light with a resistance of 250 ohms and a line in with resistance of 0.25 ohms in. The circuit is a series circuit.  $V = 120$

a. compute the equivalent resistance of the circuit consisting of the light and lines

$$R_s = 0.25\Omega + 250\Omega + 0.25\Omega = \boxed{250.5 \Omega}$$

b. find the current

$$R = \frac{V}{I} \quad I = \frac{120V}{250.5\Omega} = \boxed{0.479 A}$$

c. find the power of the light

$$P = V \times I = 120V \times 0.479 A = \boxed{51.9 W}$$

$$R = \frac{V}{I}$$

$$250 = \frac{V}{1.497}$$

$$V = 120.25$$