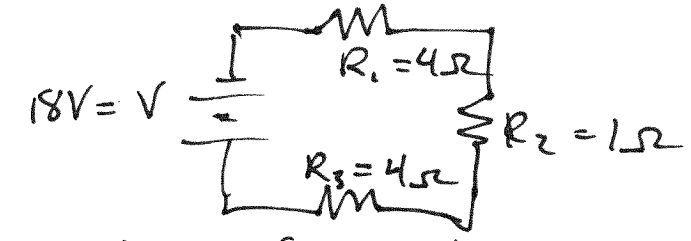
Ch 10 Prob 35

$V = 18.00\ V$



a) Find the equivalent resistance of the circuit

Resistors are in series, so

$$R_{tot} = R_1 + R_2 + R_3 = 4\Omega + 1\Omega + 4\Omega = 9\Omega$$

b) Find the current in each resistor,

since they are in series the current coming out of the power supply is also the current running through each resistor.

$$V = I R_{tot} \rightarrow I = \frac{V}{R_{tot}} = \frac{(18.00\ V)}{9\Omega}$$

$$= \boxed{2A}$$

c) Find the potential drop across each resistor

$$V_1 = IR_1 \rightarrow V_1 = (2A)(4\Omega) = \boxed{8V}$$

$$V_2 = IR_2 \rightarrow V_2 = (2A)(1\Omega) = \boxed{2V}$$

$$V_3 = IR_3 \rightarrow V_3 = (2A)(4\Omega) = \boxed{8V}$$

d) Find the power dissipated by each resistor

$$P_1 = I_1 V_1 = (2A)(8V) = \boxed{16W}$$

$$P_2 = I_2 V_2 = (2A)(2V) = \boxed{4W}$$

$$P_3 = I_3 V_3 = (2A)(8V) = \boxed{16W}$$

e) Total Power supplied by Power supply.

$$P = I \cdot V = (2A)(18V) = \boxed{36\ W}$$