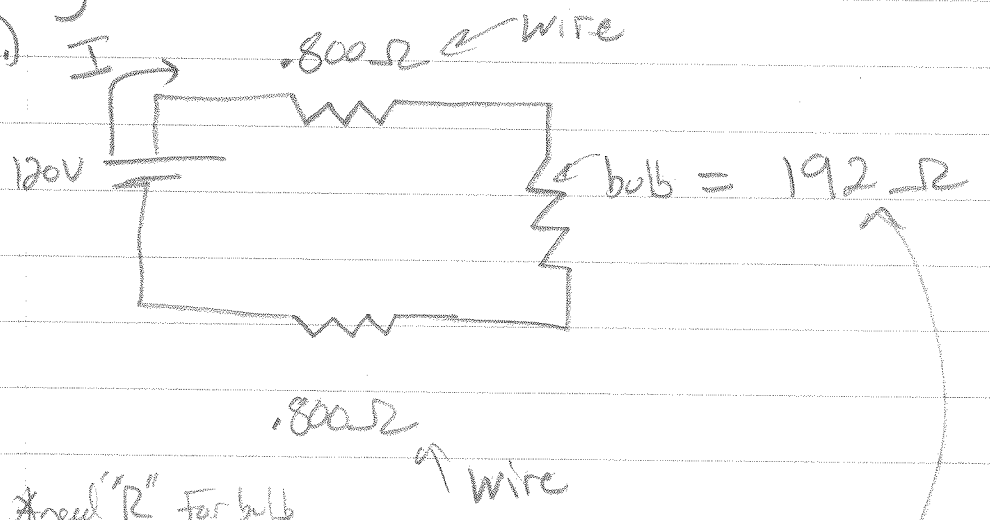
Pg 578 #3

3.)



*need "R" for bulb

$$P = \frac{V^2}{R} \rightarrow R = \frac{V^2}{P} = \frac{(120V)^2}{75W} = 192\,\Omega$$

* Since wires have some resistance, the bulb does not actually recieve 120V of energy, so the wattage of the bulb would be less than 75W

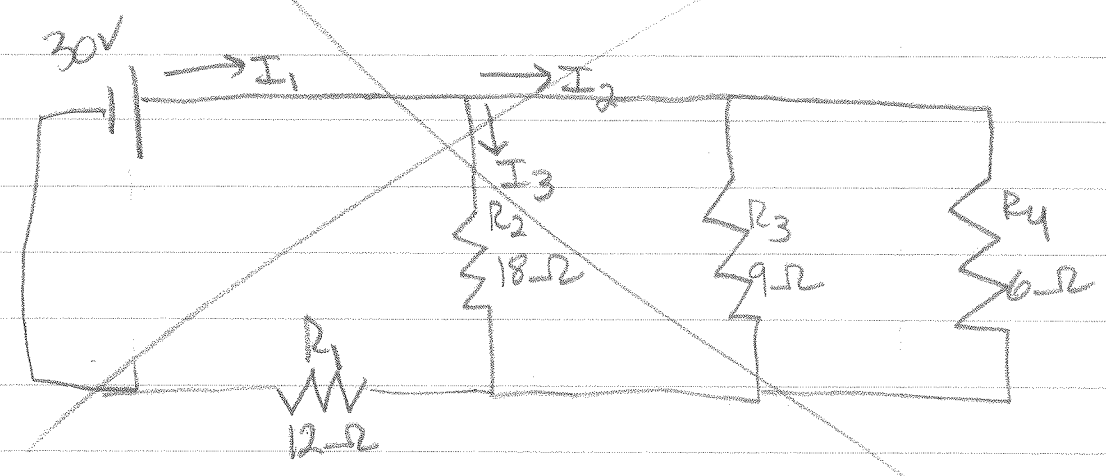
↳ need to determine "I" for circuit

$$I = \frac{\Delta V}{R_{eq}} = \frac{120V}{(.800\Omega + 192\Omega + .800\Omega)} = .62 \text{ amps}$$

$$P = I^2R \rightarrow P = (.62\text{amps})^2(192\,\Omega) = 73.8 \text{ watts}$$

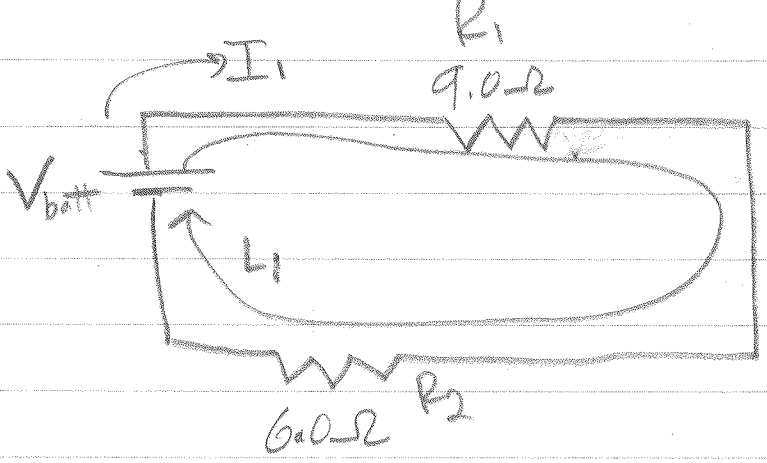
Pg 578: 6; 7 (Find voltage drop & power for each resistor) 14

65



Pg 578: 4

4 a.)



* I_1 is equal @ all points in circuit, so we can use the 6.0 Ω resistor & its voltage drop to determine I_1

$$\hookrightarrow V_{6.0\Omega} = I_1 \cdot R_{6.0\Omega} \rightarrow I_1 = \frac{V_{6.0\Omega}}{R_{6.0\Omega}} = \frac{12V}{6.0\Omega} = 2 \text{ amps}$$

Loop Eq for L_1 can now determine V_{batt}

$$L_1 \rightarrow \Delta V = 0V = V_{batt} - V_{9.0\Omega} - V_{6.0\Omega}$$

$$\hookrightarrow \Delta V = 0V = V_{batt} - I_1 \cdot R_1 - I_1 \cdot R_2$$

$$\hookrightarrow \Delta V = 0V = V_{batt} - (2 \text{ amps} \cdot 9.0\Omega) - (2 \text{ amps} \cdot 6.0\Omega)$$

$$V_{batt} = 30 V$$

Power In Each Resistor $P = IV = \frac{V^2}{R} = I^2 \cdot R$

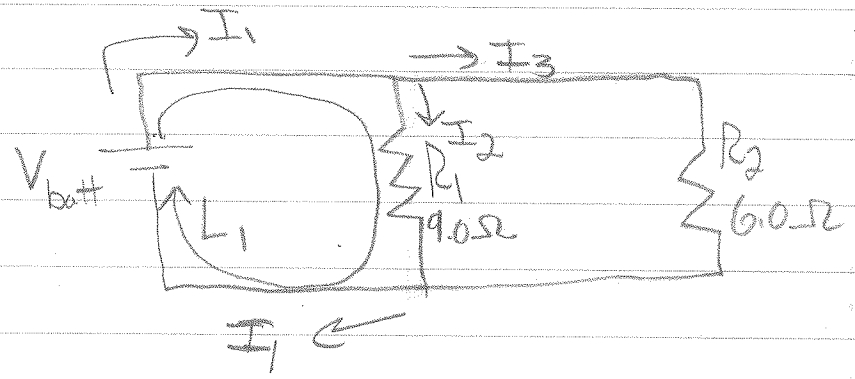
- for 9.0 Ω

$\hookrightarrow P = I^2 \cdot R = (2 \text{ amps})^2 \cdot 9.0\Omega = 36 \text{ Watts}$

- for 6.0 Ω

$\hookrightarrow P = I^2 \cdot R = (2 \text{ amps})^2 \cdot 6.0\Omega = 24 \text{ watts}$

Pg 578 #46



$I_2 = .25 \text{ amps}$

$\Delta V_{L_1} = 0V = V_{batt} - V_{R_1} = V_{batt} - I_2 \cdot R_1$

$\rightarrow V_{batt} = I_2 \cdot R_1 = .25 \text{ amps} \cdot 9.0\,\Omega$ $V_{batt} = 2.3\,V$

To determine Power in Each Resistor

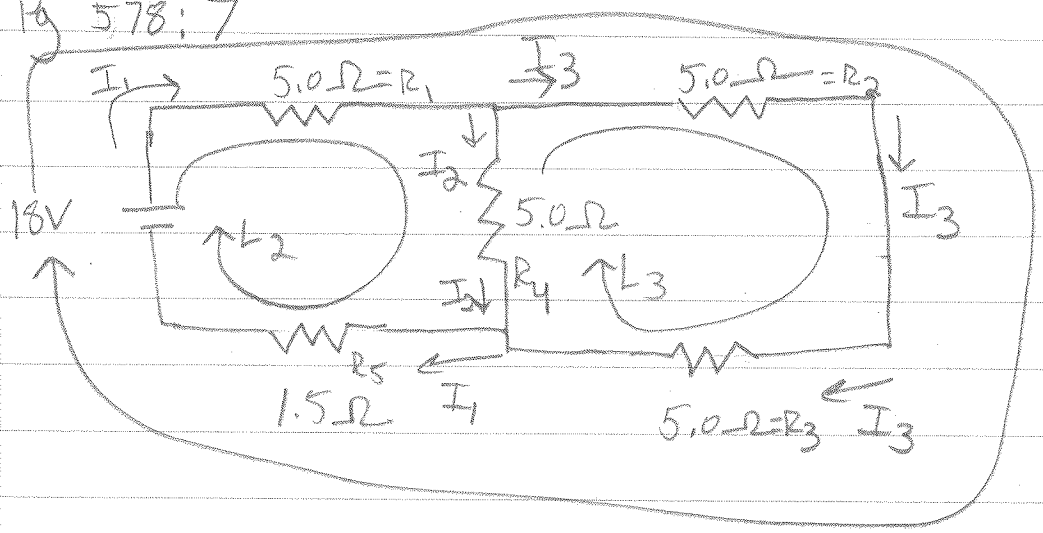
$R_1 \rightarrow P = I^2R = (I_2)^2 \cdot R_1 = (.25 \text{ amps})^2 (9.0\,\Omega) = .563 \text{ watts}$

$R_2 \rightarrow P = \frac{V^2}{R} = \frac{(2.3V)^2}{(6.0\,\Omega)} = .882 \text{ watts}$

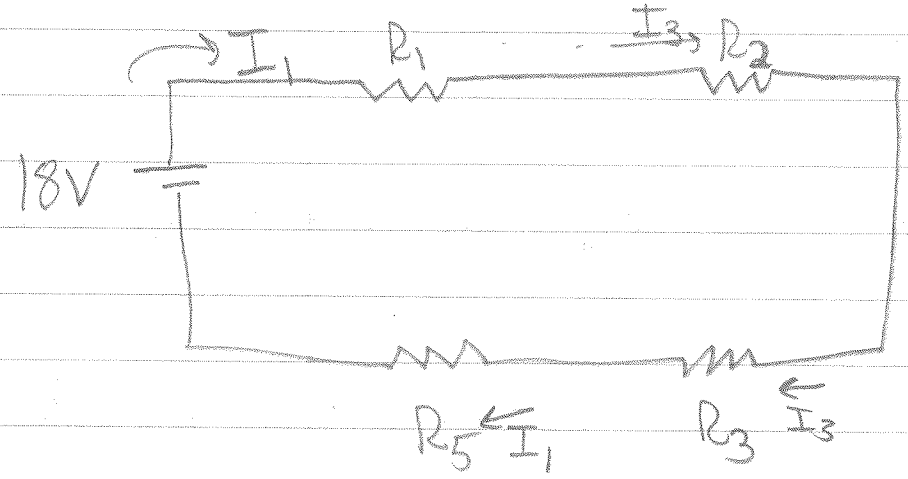
$\rightarrow$ * Voltage for resistors in parallel is all same, and same as battery (2.3V)

Pg 578: 7

7.)



L_1 redrawn

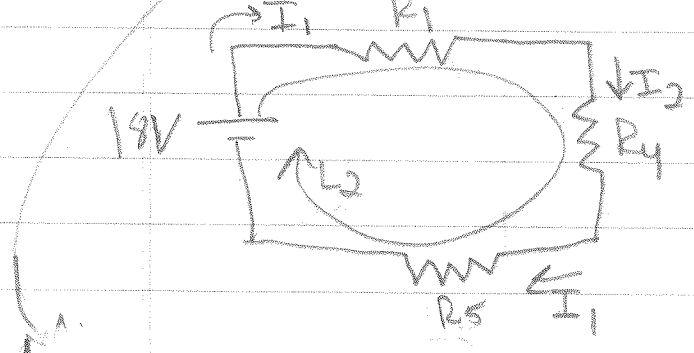


L_1 $\Delta V = 0V = 18V - V_{R_1} - V_{R_2} - V_{R_3} - V_{R_5}$

$0V = 18V - I_1 R_1 - I_3 R_2 - I_3 R_3 - I_1 R_5$

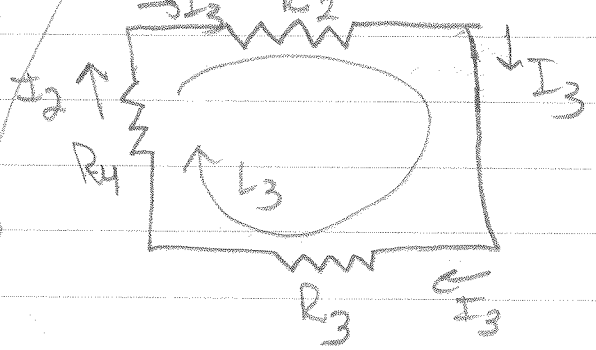
L_2 redrawn

$L_2 \rightarrow \Delta V = 0V = 18V - V_{R_1} - V_{R_4} - V_{R_5}$



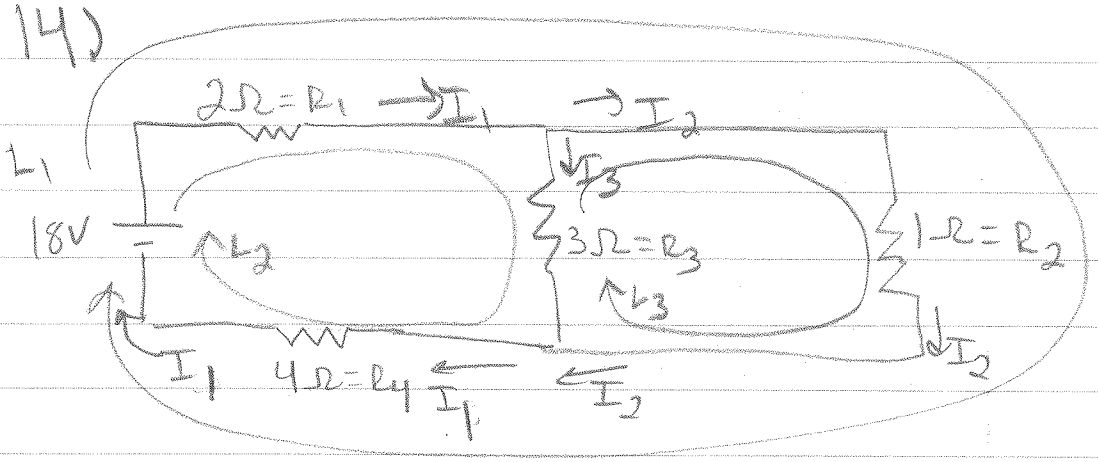
$\Delta V = 0V = 18V - I_1 R_4 - I_2 R_4 - I_1 R_5$

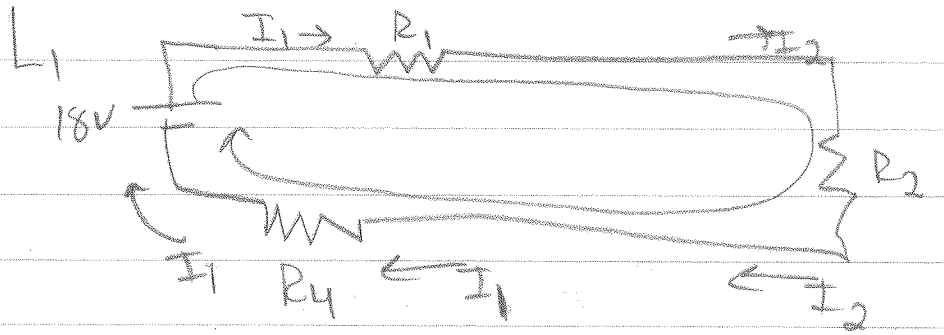
L_3 $\Delta V = V_{R_4} - V_{R_2} - V_{R_3}$



$\Delta V = I_2 R_4 - I_3 R_2 - I_3 R_3$

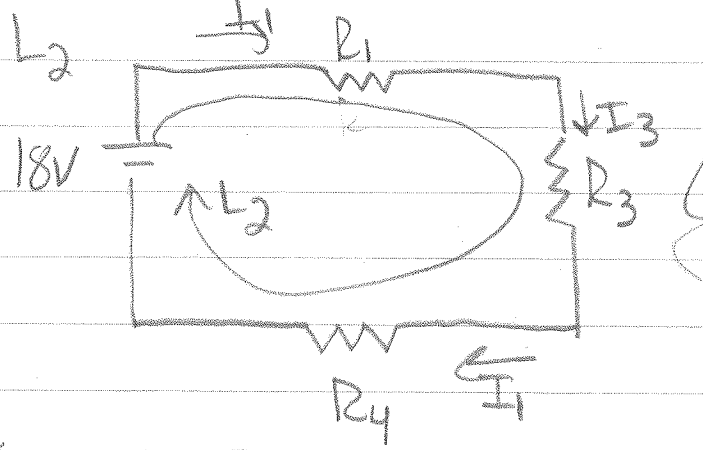
14)





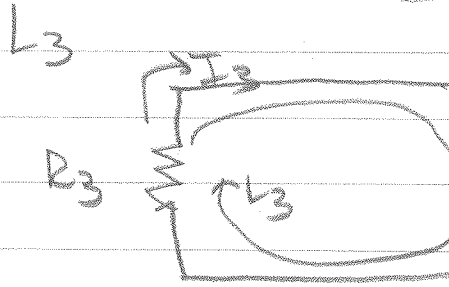
L1

$\Delta V = 0V = 18V - V_{R1} - V_{R2} - V_{R4} = 18V - I_1 R_1 - I_2 R_2 - I_1 R_4$



$\Delta V = 0V = 18V - V_{R1} - V_{R3} - V_{R4}$

$\Delta V = 0V = 18V - I_1 R_1 - I_3 R_3 - I_1 R_4$



$\Delta V = 0V = V_{R3} - V_{R2}$

$\Delta V = 0V = I_3 \cdot R_3 - I_2 \cdot R_2$