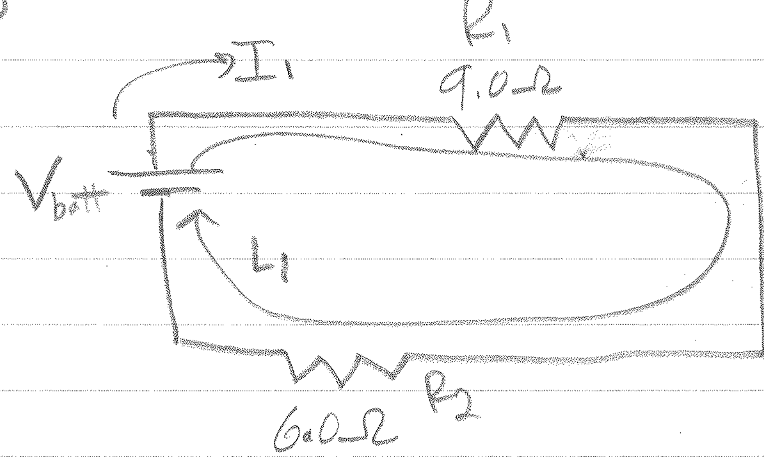
Pg 578 : 4

4 a)




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

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

Loop Eq for $L_1$ can now determine $V_{batt}$

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

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

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

$V_{batt} = 30V$

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

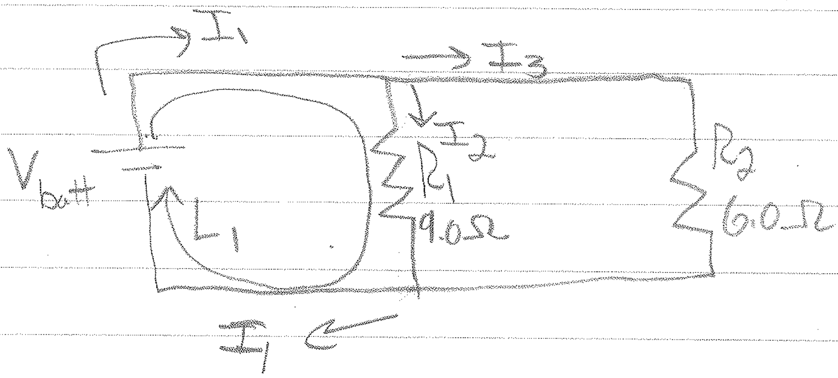
– For $9.0\Omega$

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

– For $6.0\Omega$

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

Pg 578 #4b




$I_2 = .25\text{amps}$

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

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

To determine Power in Each Resistor

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

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

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