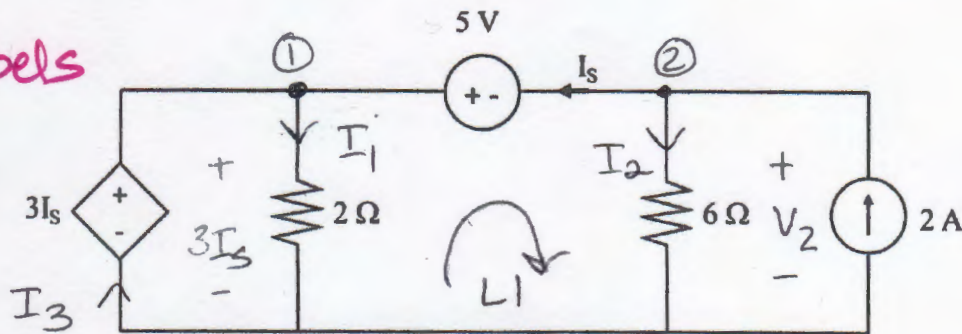Key / Solution

1. Consider the following circuit. Using Brute Force, solve for all the voltages and currents in the circuit and then find the **power delivered by each source and absorbed by each resistor**.

Circuit labels
+2 pts

KCL

$I_S + I_3 = I_1$ + 2pts

$2 = I_2 + I_S$ + 2pts

KVL

$3I_S - 5 - V_2 = 0$ + 2pts

Ohm's Law

$3I_S = 2I_1$ +2 pts

$V_2 = 6I_2$ + 2pts

$\Sigma P_{del} = 16.13 W$ +1pt each
$\Sigma P_{abs} = 16.13 W$

$2I_1 - 5 - 6I_2 = 0$

$\boxed{2I_1 - 6I_2 = 5}$

$2 = I_2 + 0.667 I_1$

$\boxed{0.667 I_1 + I_2 = 2}$

$\boxed{\begin{array}{l} I_1 = 2.83\bar{3} A \\[4pt] I_2 = 0.1\bar{1} A \\[4pt] I_S = 1.889 A \\[4pt] V_2 = 0.667 V \end{array}}$

+3 pts math

$I_3 = 0.944 A$

P: $3I_S$A	P: 2A	P: 5V	P: 2Ω	P: 6Ω
5.35W D	1.33W D	9.44W D	16.06 W, A	0.074 W, Abs

$P = 3I_S \cdot I_3$ $P = 2V_2$ $P = 5I_S$ $P = I_1^2 \cdot 2$ $P = I_2^2 \cdot 6$