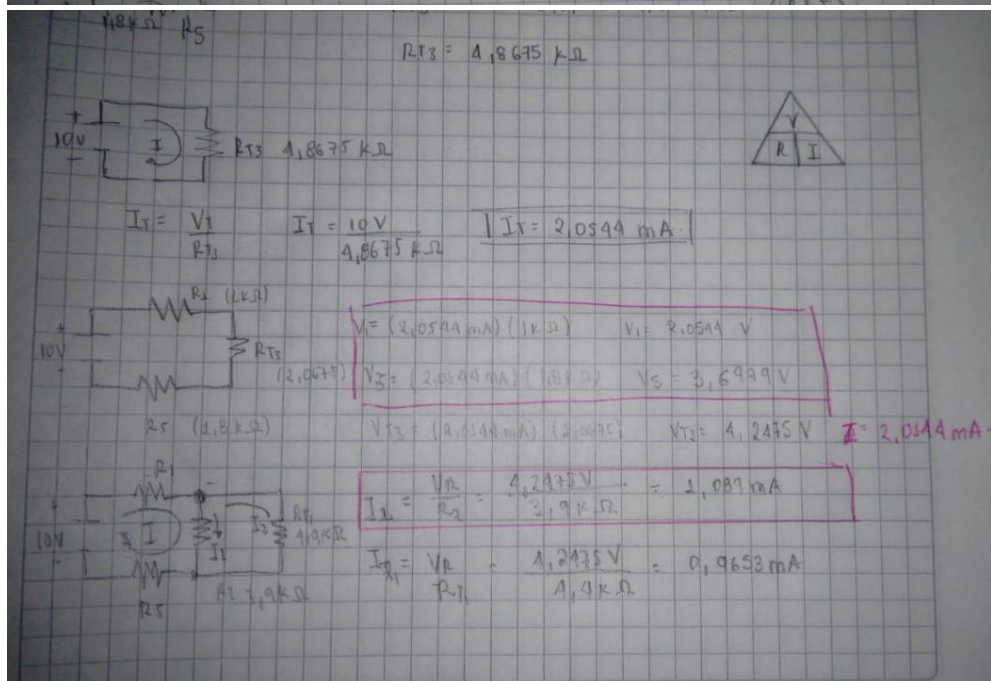
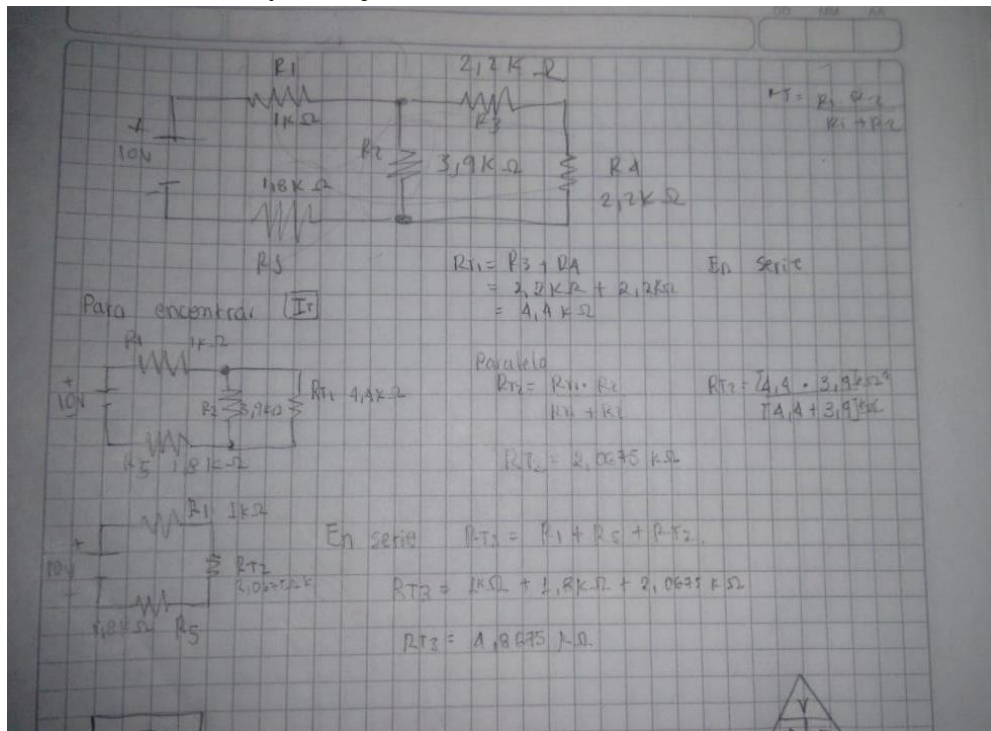
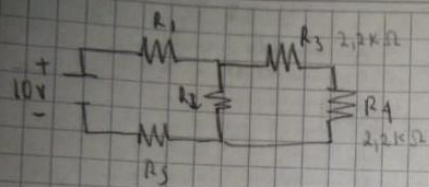


## ANEXOS

Cálculos Intensidad y Voltaje de resistencias:





$$V_{R3} = (0.9653)(2.2) = 2.1235V$$

$$V_{R4} = (0.9653)(2.2) = 2.1235V$$

	Resistencia	Voltaje	Amperio:
R1	1 kΩ	2.0544V	2.0544mA
R2	3.9 kΩ	4.2435V	1.089 mA
R3	2.2 kΩ	2.1235V	0.9653 mA
R4	2.2 kΩ	2.1235V	0.9653 mA
R5	1.8 kΩ	3.6979V	2.0544mA

## CÁLCULOS DE VERIFICACIÓN DE LA LCK Y LVK

Tabla 1.2 Verificación de la LVK

Voltage	Trayectoria 1		Trayectoria 2		Trayectoria 3	
	Calculado	Medido	Calculado	Medido	Calculado	Medido
$V_t (V)$	10,002	10	8,496	8,49	10,002	9,99
$V_{R1} (V)$	2,055	2,05	—	—	2,055	2,05
$V_{R2} (V)$	4,248	4,25	4,248	4,25	—	—
$V_{R3} (V)$	—	—	2,125	2,12	2,125	2,12
$V_{R4} (V)$	—	—	2,123	2,12	2,123	2,12
$V_{R5} (V)$	3,699	3,70	—	—	3,699	3,70
$\Sigma V$	-10,002	-10	0	0,01	-10,002	-9,99

LKV)

Trayectoria 1

$$\sum V_i(t) = 0$$

$$-V_5 + V_2 - V_1 + 10 = 0$$

$$-V_5 - V_2 - V_1 = -10 \quad (1)$$

Trayectoria 2

$$-V_4 - V_3 + V_2 = 0$$

$$V_2 - V_4 - V_3 = 0 \quad (2)$$

Trayectoria 3

$$-V_4 - V_3 - V_1 + 10 - V_5 = 0$$

$$-V_4 - V_3 - V_1 - V_5 = -10 \quad (3)$$

Comprobación

$$-V_5 - V_2 - V_1 = -10$$

$$-3,699 - 4,248 - 2,055 = -10$$

$$-10 = -10$$

$$V_2 - V_4 - V_3 = 0$$

$$4,248 - 2,123 - 2,115 = 0$$

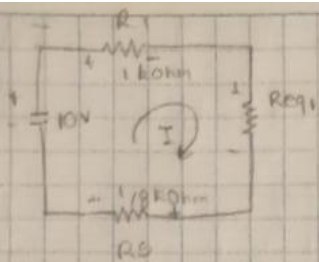
$$0 = 0$$

$$-V_4 - V_3 - V_1 - V_5 = -10$$

$$-2,123 - 2,125 - 2,055 - 3,699 = -10$$

$$-10 = -10$$





$$R_{eq1} = \frac{1}{\frac{1}{3,9 \text{ k}\Omega} + \frac{1}{2,2 \text{ k}\Omega + 2,2 \text{ k}\Omega}}$$

$$R_{eq1} = 2,067 \text{ k}\Omega$$

$$I_1 = I_3$$

$$\begin{aligned} -V_3 - V_{Req1} - V_1 + 10 &= 0 \\ -1,8 I_1 - 2,067 \text{ k}\Omega I_1 - I_1 + 10 &= 0 \\ -4,867 I_1 &= -10 \\ I_1 &= 2,055 \text{ mA} // \end{aligned}$$

$$\begin{aligned} V_1 &= R_1 \cdot I_1 \\ V_1 &= (1000 \Omega) (2,055 \times 10^{-3} \text{ A}) \\ V_1 &= 2,055 \text{ V} // \end{aligned}$$

$$1 \text{ KC}) \rightarrow I_1 - I_3 - I_2 = 0 \quad (1)$$

$$\rightarrow I_1 + I_3 - I_2 = 0$$

Comptation

$$\begin{aligned} 2,055 - 0,966 - 1,089 &= 0 \\ 0 &= 0 \end{aligned}$$

$$I_1 \text{ en } (1)$$

$$\begin{aligned} V_5 &= 1800 I_1 \\ V_5 &= 1800 (2,055 \times 10^{-3} \text{ A}) \\ V_5 &= 3,699 \text{ V} // \end{aligned}$$

$$\text{Ley de Ohm) } V_1 = 1000 I_1 \quad (3)$$

$$V_2 = 3900 I_2 \quad (6)$$

$$V_3 = 2200 I_3 \quad (7)$$

$$V_4 = 2200 I_3 \quad (8)$$

$$V_5 = 1800 I_1 \quad (9)$$

$$I_4 = I_3$$

$$I_5 = I_1$$



$$\begin{aligned} R_{eq2} &= 2,2 + 2,2 \\ R_{eq2} &= 4,4 \text{ k}\Omega \end{aligned}$$

$$V_{R2} = V_{Req1} = V_{Req2}$$

$$\begin{aligned} V_{Req1} &= (2067 \Omega) (2,055 \times 10^{-3} \text{ A}) \\ V_{Req1} &= 4,248 \text{ V} = V_{R2} \end{aligned}$$

$$V_2 = 4,248 \text{ V} //$$

$$V_2 \text{ en } (6)$$

$$\begin{aligned} 4,248 &= 3900 I_2 \\ I_2 &= 1,089 \times 10^{-3} \text{ A} // \end{aligned}$$

$$I_1 \text{ e } I_2 \text{ en } (4)$$

$$\begin{aligned} 2,055 \times 10^{-3} - I_3 - 1,089 \times 10^{-3} &= 0 \\ I_3 &= 9,66 \times 10^{-4} \text{ A} // \end{aligned}$$

$$I_3 \text{ en } ③$$

$$V_3 = 2200 (9,66 \times 10^{-4})$$

$$V_3 = 2,125 \text{ V} //$$

$$V_2 \text{ y } V_3 \text{ en } ②$$

$$4,248 - V_4 - 2,125 = 0$$

$$V_4 = 2,123 \text{ V} //$$

$$I_3 = I_4$$

$$I_4 = 9,66 \times 10^{-4} \text{ A} //$$

$$I_5 = I_1$$

$$I_5 = 2,055 \times 10^{-3} \text{ A} //$$

Corriente	Nodo 1		Nodo 2	
	Calculado	Medido	Calculado	Medido
$I_T (\text{mA})$	4,11	4,105	4,11	4,105
$I_{R1} (\text{mA})$	2,055	2,05	—	—
$I_{R2} (\text{mA})$	1,089	1,09	1,089	1,09
$I_{R3} (\text{mA})$	0,966	0,965	—	—
$I_{R4} (\text{mA})$	—	—	0,966	0,965
$I_{R5} (\text{mA})$	—	—	2,055	2,05
$\Sigma I$	0	-0,005	0	0,005