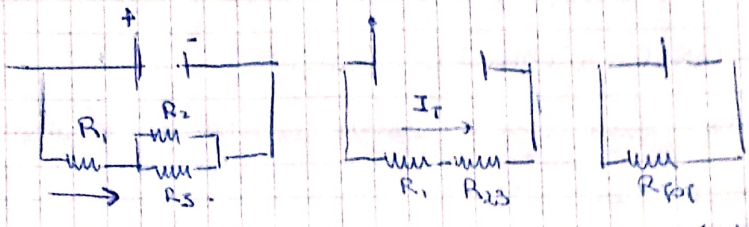
30/7.

* EJERCICIOS CIRCUITOS MIXTOS.

- Ejercicio 1

	R	V	I
1	2,5Ω	10V	4A
2	2Ω	2V	1A
3	0,3Ω	2V	6,6A
ToT	3Ω	12V	4A



$\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3}$

$R_{TOT} = R_1 + R_{23}$

$R_{TOT} = V_T / I_T$

$R_{23} = 0,5\Omega$

$R_{TOT} = 12V / 4A = 3\Omega$

$I_2 = 2V / 2\Omega = 1A$

$I_3 = 2V / 0,3\Omega = 6,6A$

$\frac{1}{0,5\Omega} = \frac{1}{2\Omega} + \frac{1}{R_3}$

$V_{23} = I_T \cdot R_{23} = 2V$

$\frac{1}{R_3} = \frac{3}{2}\Omega \rightarrow R_3 = \frac{2}{3}\Omega = 0,6\Omega$

$V_1 = I_T \cdot R_1 = 10V$

- Ejercicio 2

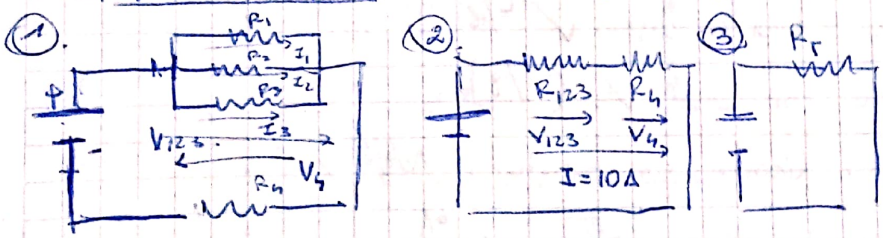
• datos. $I_T = 10A$, $R_3 = R_1 = 3\Omega$, $R_2 = 6\Omega$, $R_4 = 2\Omega$.

	R	V	I
1	3Ω	12V	4A
2	6Ω	12V	2A
3	3Ω	12V	4A
4	2Ω	20V	10A
T	3,2Ω	32V	10A

• halles R_{tot}.

$R_T = R_{123} + R_4 = 1,2\Omega + 2\Omega = 3,2\Omega$

$\frac{1}{R_{123}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{5}{6\Omega} \Rightarrow R_{123} = \frac{6}{5}\Omega = 1,2\Omega$



• hallar V_T

$V_T = I_T \cdot R_T = 32V$

(2) • Hallar Voltaje (V_{123}, V_4) → división de tensión.

$V_{123} = I_T \cdot R_{123} = 10A \cdot 1,2\Omega = 12V$

$V_4 = I_T \cdot R_4 = 10A \cdot 2\Omega = 20V$

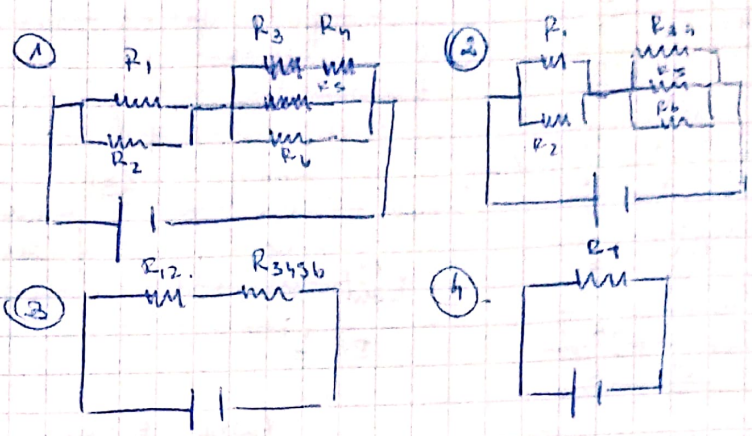
(1) • Hallar intensidad.

$I_1 = V_{123} / R_1 = 4A$ $\quad I_2 = V_{123} / R_2 = 2A$ $\quad I_3 = V_{123} / R_3 = 4A$

$I_4 = V_4 / R_4 = 10A$

* Ejercicio 3

	R	V	I
1	12Ω	13,8V	1,15A
2	12Ω	13,8V	1,15A
3	20Ω	5,8V	0,29A
4	4Ω	1,16V	0,29A
5	8Ω	7V	0,875A
6	6Ω	7V	1,16A
T	9Ω	21V	2,3A



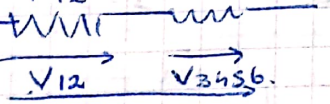
- Cálculo de Resistencias.

$$\frac{1}{R_{12}} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{6\Omega} \rightarrow \boxed{R_{12} = 6\,\Omega} \qquad R_{34} = R_3 + R_4 = 24\Omega$$

$$R_{3456} = \left(\frac{1}{R_{34}} + \frac{1}{R_5} + \frac{1}{R_6}\right)^{-1} = \left(\frac{1}{24\Omega} + \frac{1}{8\Omega} + \frac{1}{6\Omega}\right)^{-1} = 3\,\Omega.$$

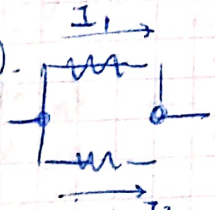
$$R_T = R_{12} + R_{3456} = 6\,\Omega + 3\,\Omega = 9\,\Omega.$$

- Hallar Intensidad tot. del circ. $\rightarrow I_T = V_T / R_T = 2,3\,A.$

(3) 

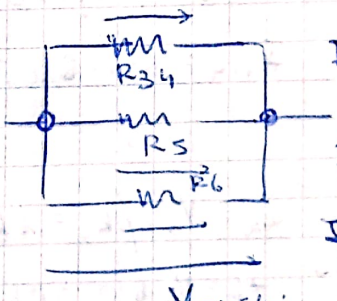
$V_{12} = I_T \cdot R_{12} = 13,8\,V$

$V_{3456} = I_T \cdot R_{3456} = 6,9\,V \simeq 7\,V$

(2) 

$I_1 = V_{12} / R_1 = 1,15A$

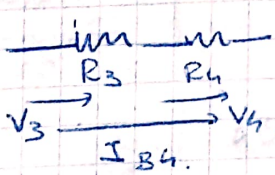
$I_2 = V_{12} / R_2 = 1,15A$



$I_5 = V_{3456} / R_5 = 0,875A$

$I_6 = V_{3456} / R_6 = 1,16A$

$I_{34} = V_{3456} / R_{34} = 0,29A$

(1) 

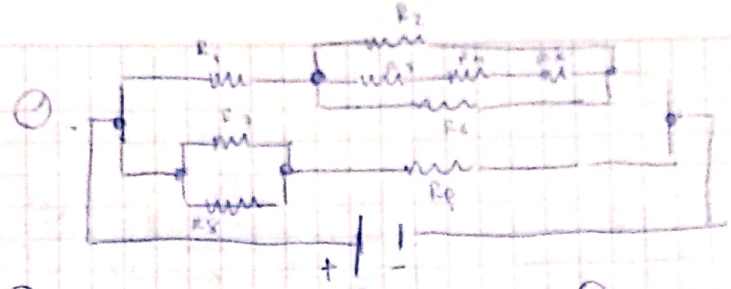
$V_3 = I_{34} \cdot R_3 = 5,8\,V$

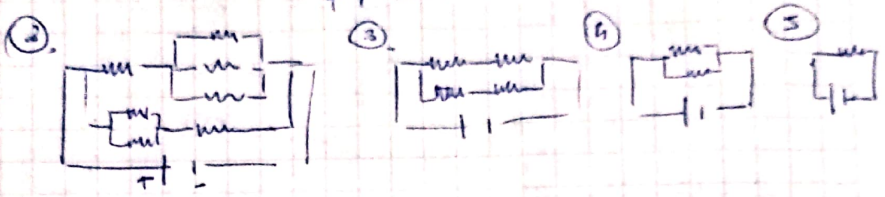
$V_4 = I_{34} \cdot R_4 = 1,16\,V$

5/8

* Ejercicio 4

	R	V	I
1	4Ω	8V	2A
2	16Ω	16V	1A
3	10Ω	3,3V	0,3A
4	22Ω	6,6V	0,3A
5	18Ω	6V	0,3A
6	24Ω	16V	0,6A
7	12Ω	12V	1A
8	4Ω	12V	3A
9	3Ω	12V	4A
T	4Ω	24V	6A





* Hallar resistencias

$R_{345} = R_3 + R_4 + R_5 = 48\,\Omega$

$\frac{1}{R_{2345}} = \frac{1}{R_{345}} + \frac{1}{R_2} + \frac{1}{R_6} = \frac{1}{8\Omega} \Rightarrow R_{23456} = 8\,\Omega$

$R_{123456} = R_1 + R_{23456} = 4\Omega + 8\Omega = 12\,\Omega$

$R_{78} = \left(\frac{1}{R_7} + \frac{1}{R_8}\right)^{-1} = 3\,\Omega$

$R_{789} = R_{78} + R_9 = 6\,\Omega$

$R_{TOT} = \left(\frac{1}{R_{123456}} + \frac{1}{R_{789}}\right)^{-1} = \left(\frac{1}{12\Omega} + \frac{1}{6\Omega}\right)^{-1} = 4\,\Omega$

$I_{TOT} = V_{TOT}/R_{TOT} = 24V/4\Omega = 6A.$

④ $R_{1-6} = 12\,\Omega$

$I_{1-6} = 24V/12\Omega = 2A$

$I_{7-9} = 24V/6\Omega = 4A.$

$R_{789} = 6\,\Omega$

$V = 24V$

③ $I = 2A$

$V_1 = 2A \cdot R_1 = 8V$

$V_{2-6} = 2A \cdot R_{2-6} = 16V$

$V_{78} = 4A \cdot R_{78} = 12V$

$V_9 = 4A \cdot R_9 = 12V$

$I_{7-9} = 4A$

② $I_2 = V_{2-6}/R_2 = 1A$

$I_6 = V_{2-6}/R_6 = 0,6A.$

$V_{2-6} = 16V$ $I_{3-5} = V_{2-6}/R_{3-5} = 0,3A$

② $I_7 = V_{78}/R_7 = 1A$

$I_8 = V_{78}/R_8 = 3A.$

① $V_1 = R_1 \cdot I_1 = 8V$

$I_{1-6} = 2A$

① $V_3 = R_3 \cdot I_{3-5} = 3,3V$

$V_4 = R_4 \cdot I_{3-5} = 6,6V$

$V_5 = R_5 \cdot I_{3-5} = 6V.$

$I_{3-5} = 0,3A.$