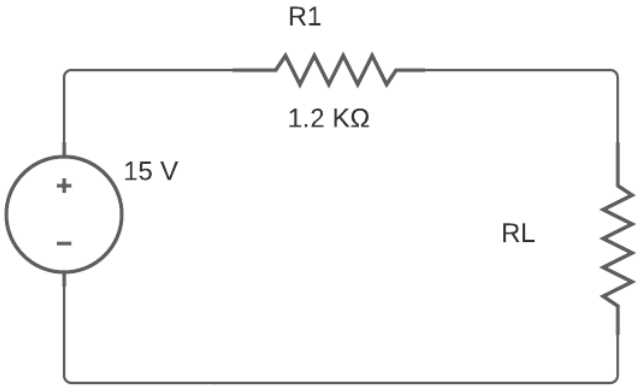
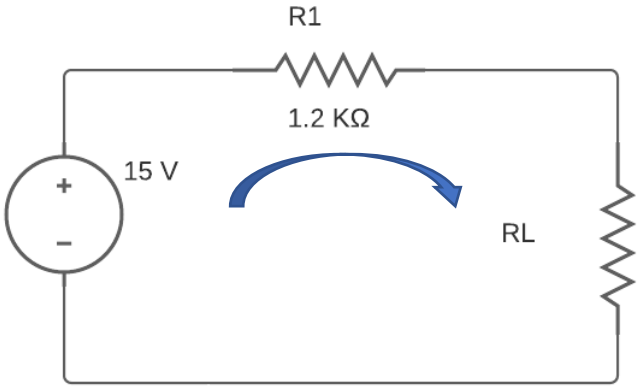


Proceso para calcular Resistencia



Variación de RL

Cantidad	*Resistencia*
1	*Resistor de 220 Ω*
1	*Resistor de 470 Ω*
1	*Resistor de 680 Ω*
1	*Resistor de 820 Ω*
1	*Resistor de 1 kΩ*
1	*Resistor de 1.5 kΩ*
1	*Resistor de 1.8 kΩ*
1	*Resistor de 2.2 kΩ*
1	*Resistor de 3.9 kΩ*
1	*Resistor de 4.7 kΩ*

Fórmulas generales

$$R_{eq} = R1 + RL$$

$$V_{RL} = V_T * \frac{RL}{R_{eq}}$$

$$i = \frac{V}{R_{eq}}$$

$$P = \frac{V_{RL}^2}{R_L}$$

$$P = i^2 * R_L$$

Cálculos.

Resistor de 220 Ω

$$R_{eq} = 1.2k\Omega + 220\Omega = 1420\Omega$$

$$i = \frac{15}{1420} = 0,01056A \approx 10,561\ mA$$

$$V_{RL} = 15 * \frac{220}{1420} = 2,32V$$

$$P = \frac{(2,32)^2}{220} = 0,0245\ W$$

$$P = (0,01056)^2 * 220 = 0,0245W$$

Resistor de 470 Ω

$$R_{eq} = 1.2k\Omega + 470\Omega = 1670\Omega$$

$$i = \frac{15}{1670} \approx 8,982035\ mA$$

$$V_{RL} = 15 * \frac{470}{1670} = 4,22V$$

$$P = \frac{(4,22)^2}{470} = 0,0379\ W$$

$$P = \left(8,982035 * 10^{-3}\right)^2 * 470 = 0,0379W$$

Resistor de 680 Ω

$$R_{eq} = 1.2k\Omega + 680\Omega = 1880\Omega$$

$$i = \frac{15}{1880\Omega} \approx 7,98\ mA$$

$$V_{RL} = 15 * \frac{680}{1880} = 5,42V$$

$$P = \frac{(5,42)^2}{680} = 0,0432W$$

$$P = \left(7,98 * 10^{-3}\right)^2 * 680 = 0,0432W$$

Resistor de 820 Ω

$$R_{eq} = 1.2k\Omega + 820\Omega = 2020\Omega$$

$$i = \frac{15}{2020\Omega} \approx 7,43\ mA$$

$$V_{RL} = 15 * \frac{820}{2020} = 6,089V$$

$$P = \frac{(6,09)^2}{820} = 0,0452W$$

Resistor de 1k Ω

$$R_{eq} = 1.2k\Omega + 1k\Omega = 2.2k\Omega$$

$$i = \frac{15}{2200\Omega} \approx 6,82\ mA$$

$$V_{RL} = 15 * \frac{1000}{2200} = 6,82V$$

$$P = \frac{(6,82)^2}{1000} = 0,0465W$$

Resistor de 1.5 k Ω

$$R_{eq} = 1.2k\Omega + 1.5k\Omega = 2.7k\Omega$$

$$i = \frac{15}{2700\Omega} \approx 5,55\ mA$$

$$V_{RL} = 15 * \frac{1500}{2700} = 8,33V$$

$$P = \frac{(8,33)^2}{1500} = 0,0462W$$

Resistor de 1.8 k Ω

$$R_{eq} = 1.2k\Omega + 1.8k\Omega = 3k\Omega$$

$$i = \frac{15}{3000\Omega} \approx 5\ mA$$

$$V_{RL} = 15 * \frac{1800}{3000} = 9V$$

$$P = \frac{(9)^2}{1800} = 0,045W$$

Resistor de 2.2 k Ω

$$R_{eq} = 1.2k\Omega + 2.2k\Omega = 3.4\ k\Omega$$

$$i = \frac{15}{3400\Omega} \approx 4,41\ mA$$

$$V_{RL} = 15 * \frac{2200}{3400} = 9,71V$$

$$P = \frac{(9,71)^2}{2200} = 0,0429W$$

Resistor de 3.9 k Ω

$$R_{eq} = 1.2k\Omega + 3.9k\Omega = 5.1\ k\Omega$$

$$i = \frac{15}{5100\Omega} \approx 2,941\ mA$$

$$V_{RL} = 15 * \frac{3900}{5100} = 11,47V$$

$$P = \frac{(11,47)^2}{3900} = 0,0337W$$

Resistor de 4.7 k Ω

$$R_{eq} = 1.2k\Omega + 4.7k\Omega = 5.9\ k\Omega$$

$$i = \frac{15}{5900\Omega} \approx 2,54\ mA$$

$$V_{RL} = 15 * \frac{4700}{5900} = 11,95V$$

$$P = \frac{(11,95)^2}{4700} = 0,0304W$$

Tabla

Tabla 6.1. Parámetros Eléctricos del circuito de la figura 6.1.

RL (Ω)	Corriente medida [mA]	Corriente Calculada [mA]	Error %	Voltaje medido [V]	Voltaje Calculado [V]	Error %	Potencia calculada experimentalmente [W]	Potencia calculada teóricamente [W]	Error %
220	10,6	10,561	0,3693	2,32	2,32	0,0000	0,0246	0,0245	0,3755
470	8,98	8,982	0,0223	4,22	4,22	0,0000	0,0379	0,0379	0,0116
680	7,98	7,98	0,0000	5,43	5,42	0,1845	0,0433	0,0432	0,3042
820	7,43	7,43	0,0000	6,09	6,089	0,0164	0,0452	0,0452	0,0000
1000	6,82	6,82	0,0000	6,82	6,82	0,0000	0,0465	0,0465	0,0000
1500	5,56	5,55	0,1802	8,33	8,33	0,0000	0,0463	0,0462	0,2485
1800	5,00	5,00	0,0000	9,00	9,00	0,0000	0,0450	0,0450	0,0000
2200	4,41	4,41	0,0000	9,71	9,71	0,0000	0,0428	0,0429	0,1839
3900	2,94	2,94	0,0000	11,50	11,47	0,2616	0,0338	0,0337	0,3264
4700	2,54	2,54	0,0000	11,90	11,95	0,4184	0,0302	0,0304	0,5724