

Guía de ejercicios de la unidad 2

1.a

$$V_T = 12 \text{ V}$$

$$R_1 = 100 \, \Omega$$

$$R_2 = 1000 \, \Omega$$

$$R_3 = 220 \, \Omega$$

Cálculo de la resistencia equivalente y la corriente (intensidad) del sistema.

$$R_{eq} = R_1 + R_2 + R_3$$

$$R_{eq} = 100 \, \Omega + 1000 \, \Omega + 220 \, \Omega$$

$$\boxed{R_{eq} = 1320 \, \Omega}$$

$$i_{sis} = \frac{V_T}{R_{eq}}$$

$$i_{sis} = \frac{12 \text{ V}}{1320 \, \Omega}$$

$$\boxed{i_{sis} \cong 9,09 \text{ mA}}$$

Cálculo del voltaje y la corriente (intensidad) en cada una de las resistencias.

$$\boxed{i_1 = i_{sis} \cong 9,09 \text{ mA}}$$

$$V_1 = i_1 R_1$$

$$V_1 = \frac{9,09 \text{ A}}{1000} \frac{100 \text{ V}}{\text{A}}$$

$$\boxed{V_1 \cong 0,91 \text{ V}}$$

$$\boxed{i_2 = i_{sis} \cong 9,09 \text{ mA}}$$

$$V_2 = i_2 R_2$$

$$V_2 = \frac{9,09 \text{ A}}{1000} \frac{1000 \text{ V}}{\text{A}}$$

$$\boxed{V_2 \cong 9,09 \text{ V}}$$

$$\boxed{i_3 = i_{sis} \cong 9,09 \text{ mA}}$$

$$V_3 = i_3 R_3$$

$$V_3 = \frac{9,09 \text{ A}}{1000} \frac{220 \text{ V}}{\text{A}}$$

$$\boxed{V_3 \cong 2,00 \text{ V}}$$

1.b

$$V_T = 5 \text{ V}$$

$$R_1 = 330 \, \Omega$$

$$R_2 = 100 \, \Omega$$

$$R_3 = 220 \, \Omega$$

$$R_4 = 1000 \, \Omega$$

Cálculo de la resistencia equivalente y la corriente (intensidad) del sistema.

$$R_{12} = R_1 + R_2$$

$$R_{12} = 330 \, \Omega + 100 \, \Omega$$

$$R_{12} = 430 \, \Omega$$

$$R_{123} = \frac{1}{\frac{1}{R_{12}} + \frac{1}{R_3}}$$

$$R_{123} = \frac{1}{\frac{1}{430 \, \Omega} + \frac{1}{220 \, \Omega}}$$

$$R_{123} \cong 145,54 \, \Omega$$

$$R_{eq} = R_{123} + R_4$$

$$R_{eq} = 145,54 \, \Omega + 1000 \, \Omega$$

$$\boxed{R_{eq} \cong 1145,54 \, \Omega}$$

$$i_{sis} = \frac{V_T}{R_{eq}}$$

$$i_{sis} = \frac{5 \text{ VA}}{1145,54 \text{ V}}$$

$$\boxed{i_{sis} \cong 4,36 \text{ mA}}$$

Cálculo del voltaje y la corriente (intensidad) en cada una de las resistencias.

$$\boxed{i_4 = i_{sis} \cong 4,36 \text{ mA}}$$

$$V_4 = i_4 R_4$$

$$V_4 = \frac{4,36 \text{ A}}{1000} \frac{1000 \text{ V}}{\text{A}}$$

$$\boxed{V_4 \cong 4,36 \text{ V}}$$

$$V_{123} = V_T - V_4$$

$$V_{123} = 5 \text{ V} - 4,36 \text{ V}$$

$$V_{123} \cong 0,64 \text{ V}$$

$$\boxed{V_3 = V_{123} \cong 0,64 \text{ V}}$$

$$i_3 = \frac{V_3}{R_3}$$

$$i_3 = \frac{0,64 \text{ VA}}{220 \text{ V}}$$

$$\boxed{i_3 \cong 2,91 \text{ mA}}$$

$$V_{12} = V_{123} \cong 0,64 \text{ V}$$

$$i_{12} = \frac{V_{12}}{R_{12}}$$

$$i_{12} = \frac{0,64 \text{ VA}}{430 \text{ V}}$$

$$i_{12} \cong 1,49 \text{ mA}$$

$$\boxed{i_1 = i_{12} \cong 1,49 \text{ mA}}$$

$$V_1 = i_1 R_1$$

$$V_1 = \frac{1,49 \text{ A}}{1000} \frac{330 \text{ V}}{\text{A}}$$

$$\boxed{V_1 \cong 0,49 \text{ V}}$$

$$\boxed{i_2 = i_{12} \cong 1,49 \text{ mA}}$$

$$V_2 = i_2 R_2$$

$$V_2 = \frac{1,49 \text{ A}}{1000} \frac{100 \text{ V}}{\text{A}}$$

$$\boxed{V_2 \cong 0,15 \text{ V}}$$

2.

Link del circuito: <https://wokwi.com/projects/453250729657052161>

3.

Link del circuito: <https://wokwi.com/projects/453252760116594689>

4.

Link del circuito: <https://wokwi.com/projects/453255273623707649>

5.

Link del circuito: <https://wokwi.com/projects/453256410318931969>

6.

Link del circuito: <https://wokwi.com/projects/453267805883947009>

7.

Link del circuito: <https://wokwi.com/projects/453340623301920769>