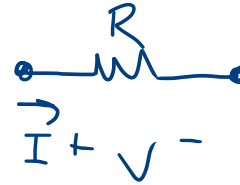
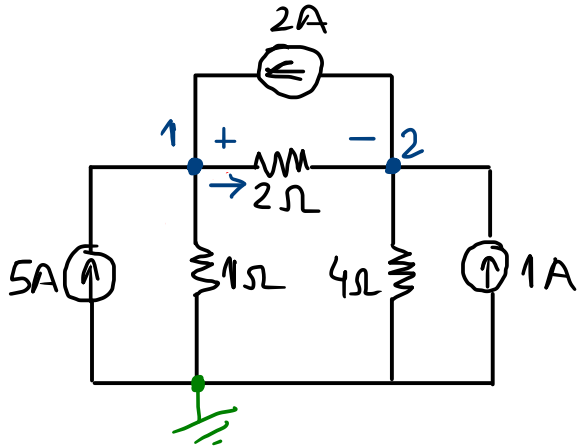


Aula de exercícios

$$G = \frac{1}{R} \text{ Siemens (S)}$$

$$V = R \cdot I$$

1)



1:

$$\frac{V_1}{1} + \frac{V_1 - V_2}{2} = 5 + 2 \quad (i)$$

2:

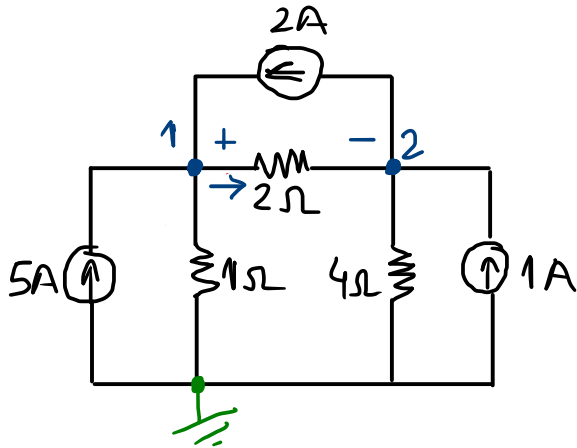
$$\frac{V_2 - V_1}{2} + \frac{V_2}{4} = 1 - 2 \quad (ii)$$

$$V_1 = \frac{38}{7} \text{ V}$$

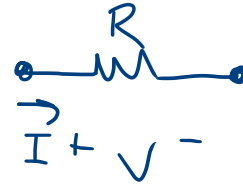
$$V_2 = \frac{16}{7} \text{ V}$$

Aula de exercícios

1)



$$G = \frac{1}{R} \text{ Siemens (S)}$$

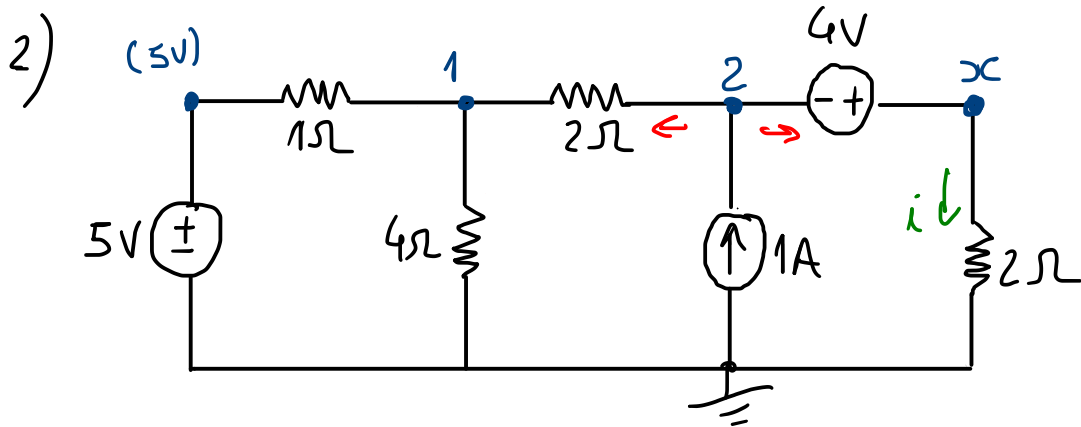


$$V = R \cdot I$$

G:

$$G = \begin{bmatrix} G_{11} & G_{12} \\ G_{21} & G_{22} \end{bmatrix} = \begin{bmatrix} (1 + \frac{1}{2}) & -\frac{1}{2} \\ -\frac{1}{2} & (\frac{1}{2} + \frac{1}{4}) \end{bmatrix} = \begin{bmatrix} 3/2 & -1/2 \\ -1/2 & 3/4 \end{bmatrix}$$

$$\begin{bmatrix} 3/2 & -1/2 \\ -1/2 & 3/4 \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \end{bmatrix} = \begin{bmatrix} 7 \\ -1 \end{bmatrix}$$



$$i = \frac{v_x}{2} ; v_x - v_2 = 4$$

$$v_x = v_2 + 4$$

1:

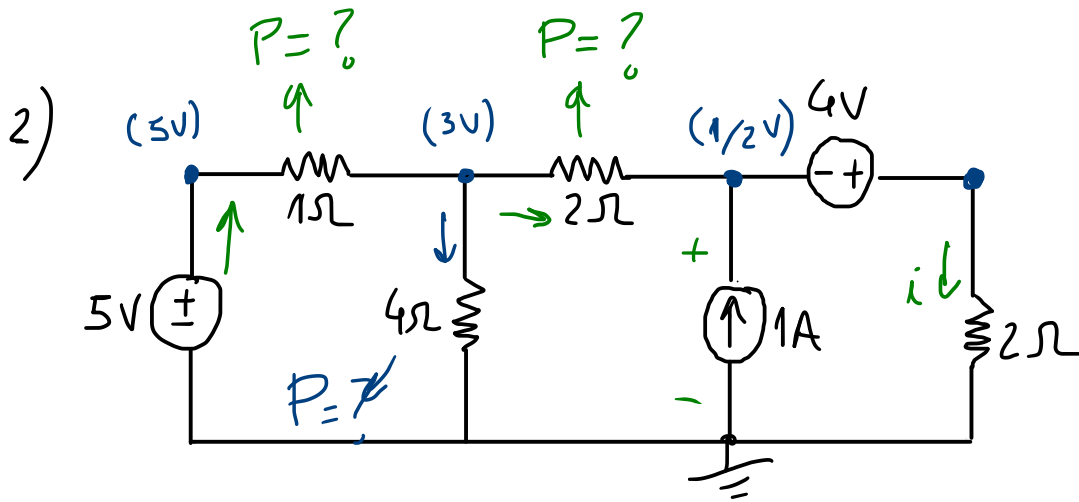
$$\frac{v_1}{4} + \frac{v_1 - v_2}{2} + \frac{v_1 - 5}{1} = 0 \quad (i)$$

$$\begin{bmatrix} 7/4 & -1/2 \\ -1/2 & 1 \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \end{bmatrix} = \begin{bmatrix} 5 \\ -1 \end{bmatrix}$$

2:

$$\frac{v_2 - v_1}{2} + \frac{v_2 + 4}{2} = 1 \quad (ii)$$

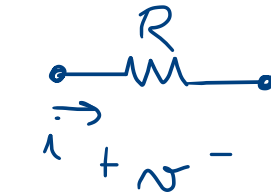
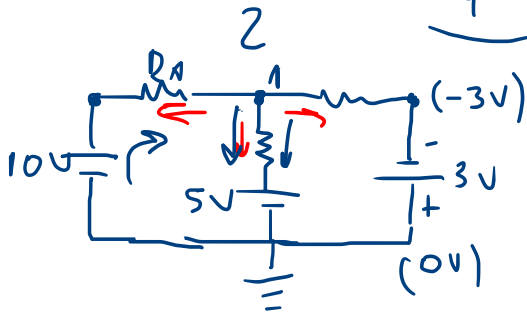
$$v_1 = 3V ; v_2 = \frac{1}{2}V$$



$$i = \frac{V_x}{2} ; V_x - V_2 = 4$$

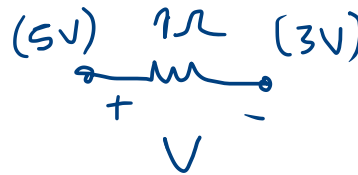
$$V_x = V_2 + 4$$

$$i = \frac{1}{2} + 4 = \frac{9}{2} A$$



$$P = V \cdot i ; P = R \cdot i^2$$

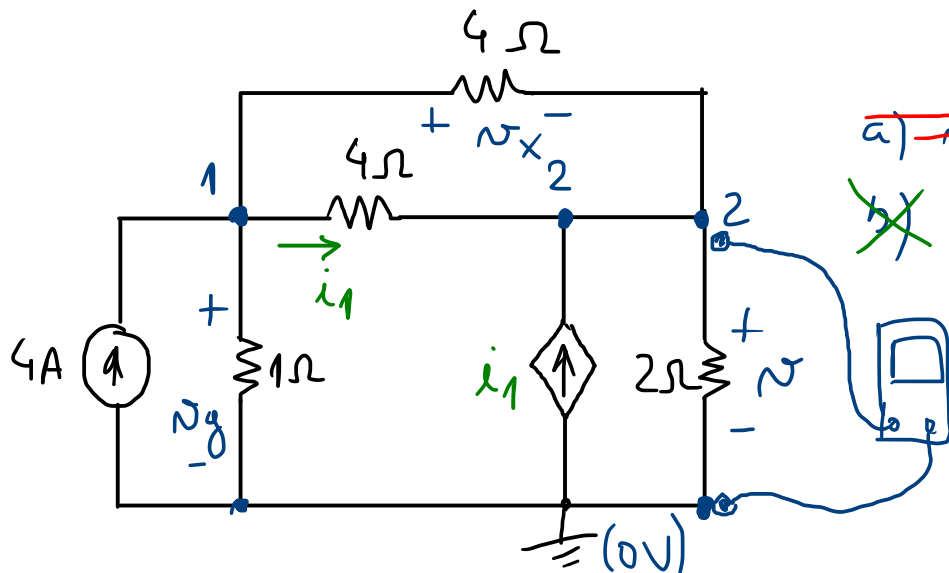
$$P = \frac{V^2}{R} [W]$$



$$V = 2V$$

$$P = \frac{V^2}{R} = \frac{2^2}{1} = 4W$$

3)



~~a) $V = V_1 + V_2$~~ c) ~~$V = V_2 - V_1$~~

~~b) $V = V_2$~~

~~d) $V = V_1 - V_2$~~

1:
$$\frac{V_1}{1} + \frac{V_1 - V_2}{4} + \frac{V_1 - V_2}{4} = 4 \quad (i)$$

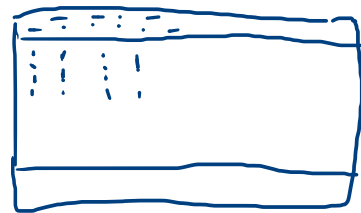
2:
$$\frac{V_2 - V_1}{4} + \frac{V_2}{2} + \frac{V_2 - V_1}{4} = i_1 \quad (ii)$$

$$i_1 = \frac{V_1 - V_2}{4} \quad (iii)$$

$$\begin{cases} V_1 = \frac{10V}{3} \\ V_2 = 2V \end{cases}$$

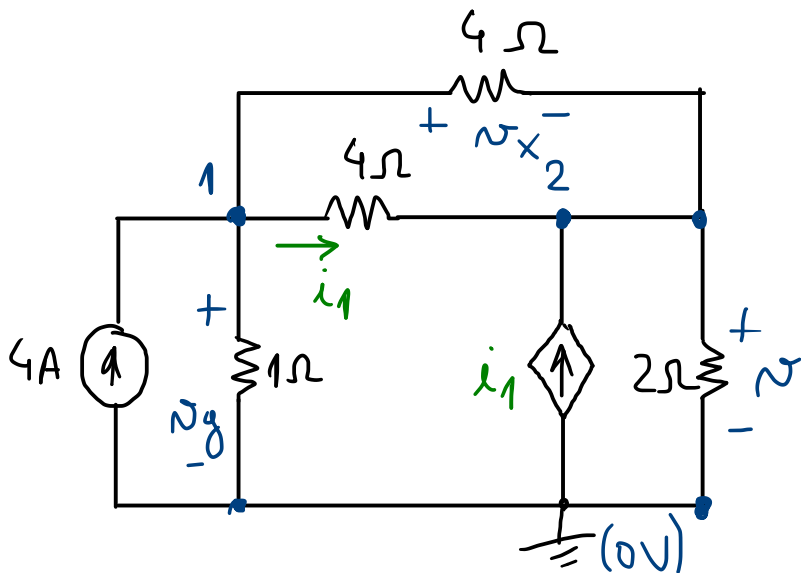
$V = V_2 - 0$

$V = V_2$



$$V_X = V_1 - V_2$$

3)



$$\underline{1:} \quad \frac{v_1}{1} + \frac{v_1 - v_2}{4} + \frac{v_1 - v_2}{4} = 4 \quad (i)$$

$$\underline{2:} \quad \frac{v_2 - v_1}{4} + \frac{v_2}{2} + \frac{v_2 - v_1}{4} = i_1 \quad (ii)$$

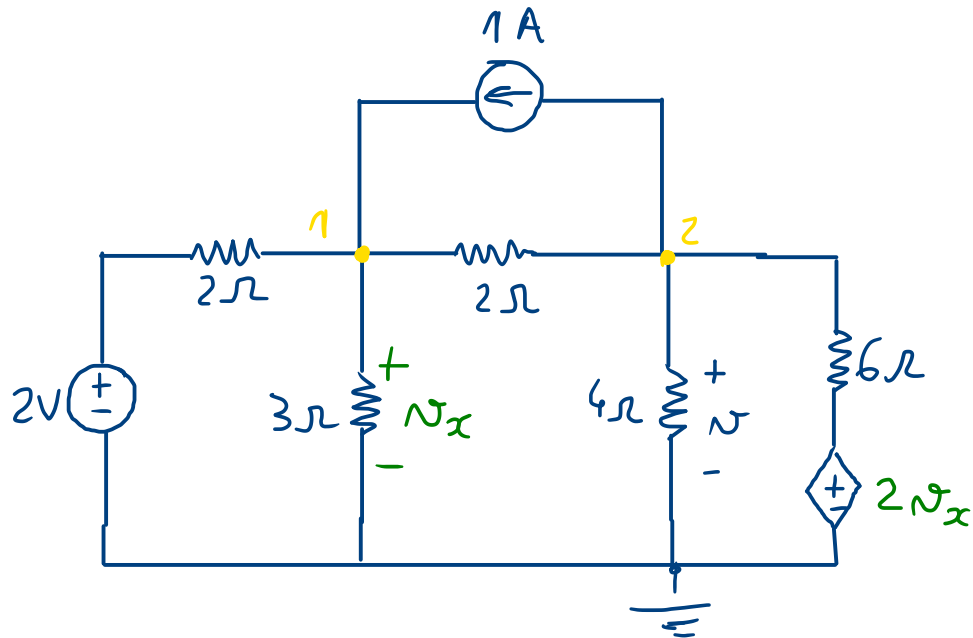
$$i_1 = \frac{v_1 - v_2}{4} \quad (iii)$$

$$\left\{ \begin{array}{l} v_1 = \frac{10V}{3} \\ v_2 = 2V \end{array} \right.$$

$$v = v_2 - v_1$$

$$\underline{v = v_2}$$

4)



$$V = ?$$

R:

$$V = \frac{12}{29} \text{ V}$$