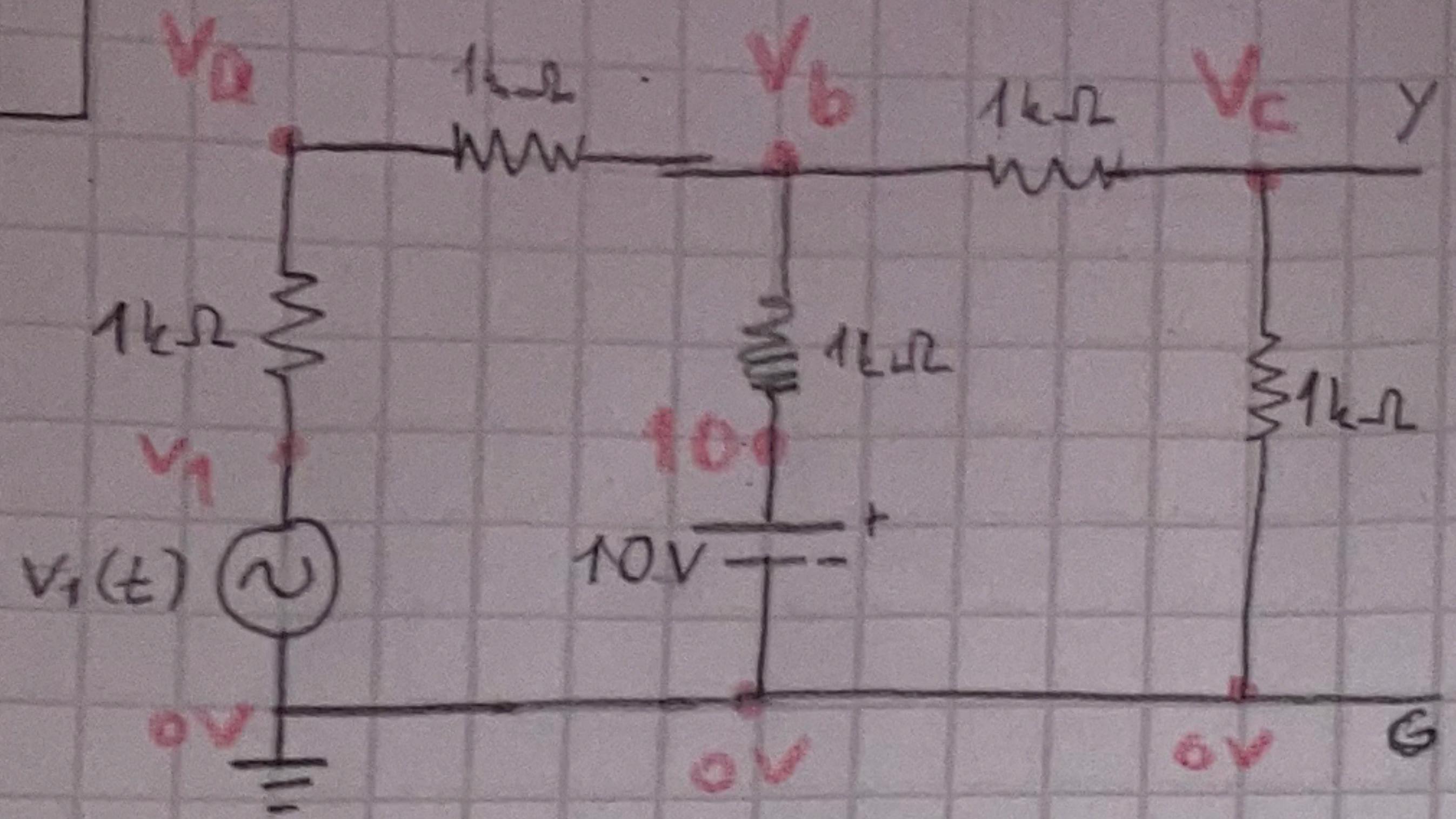


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$$\text{KCL at } A: \frac{V_a - V_1}{1k} + \frac{V_a - V_b}{1k} = 0$$

$$\text{KCL at } B: \frac{V_b - V_a}{1k} + \frac{V_b - 10}{1k} + \frac{V_b - V_c}{1k} = 0$$

$$\text{KCL at } C: \frac{V_c - V_b}{1k} + \frac{V_c}{1k} = 0$$

$$2V_a - V_b = V_1$$

$$\Rightarrow -V_a + 3V_b - V_c = 10$$

$$-V_b + 2V_c = 0$$

$$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 3 & -1 \\ 0 & -1 & 2 \end{bmatrix} \begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix} = \begin{bmatrix} V_1 \\ 10 \\ 0 \end{bmatrix}$$

$\underbrace{\quad\quad\quad}_{A}$ $\underbrace{\quad\quad\quad}_{B}$

$$\det(A) = 2 \cdot 5 + (-2) + 0 = 8$$

$$A_C = \begin{bmatrix} 2 & -1 & V_1 \\ -1 & 3 & 10 \\ 0 & -1 & 0 \end{bmatrix}, \quad \det(A_C) = 2 \cdot 10 + V_1 = V_1 + 20$$

$$= 4.5 \sin(4000\pi t) + 20$$

$$V_C = \frac{\det(A_C)}{\det(A)} = \frac{4.5 \sin(4000\pi t) + 20}{8} = V_{GY}$$

$$2 \quad f = 250 \text{ Hz} \Rightarrow T = \frac{1}{250} \text{ s} = \frac{1000}{250} \text{ msec} = 4 \text{ msec}$$

$$f = 1250 \text{ Hz} \Rightarrow T = \frac{1}{1250} \text{ s} = \frac{1000}{1250} \text{ msec} = 0.8 \text{ msec}$$

$$f = 5000 \text{ Hz} \Rightarrow T = \frac{1}{5000} \text{ s} = \frac{1000}{5000} \text{ msec} = 0.2 \text{ msec}$$

$V_1(t) = V_{\text{peak}} \sin(2\pi f t)$ volts		
V_{peak}	$f(\text{Hz})$	$T = 1/f (\text{msec})$
3	250	4
6	1250	0.8
6	5000	0.2

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3	250	4
6	1250	0.8
6	5000	0.2