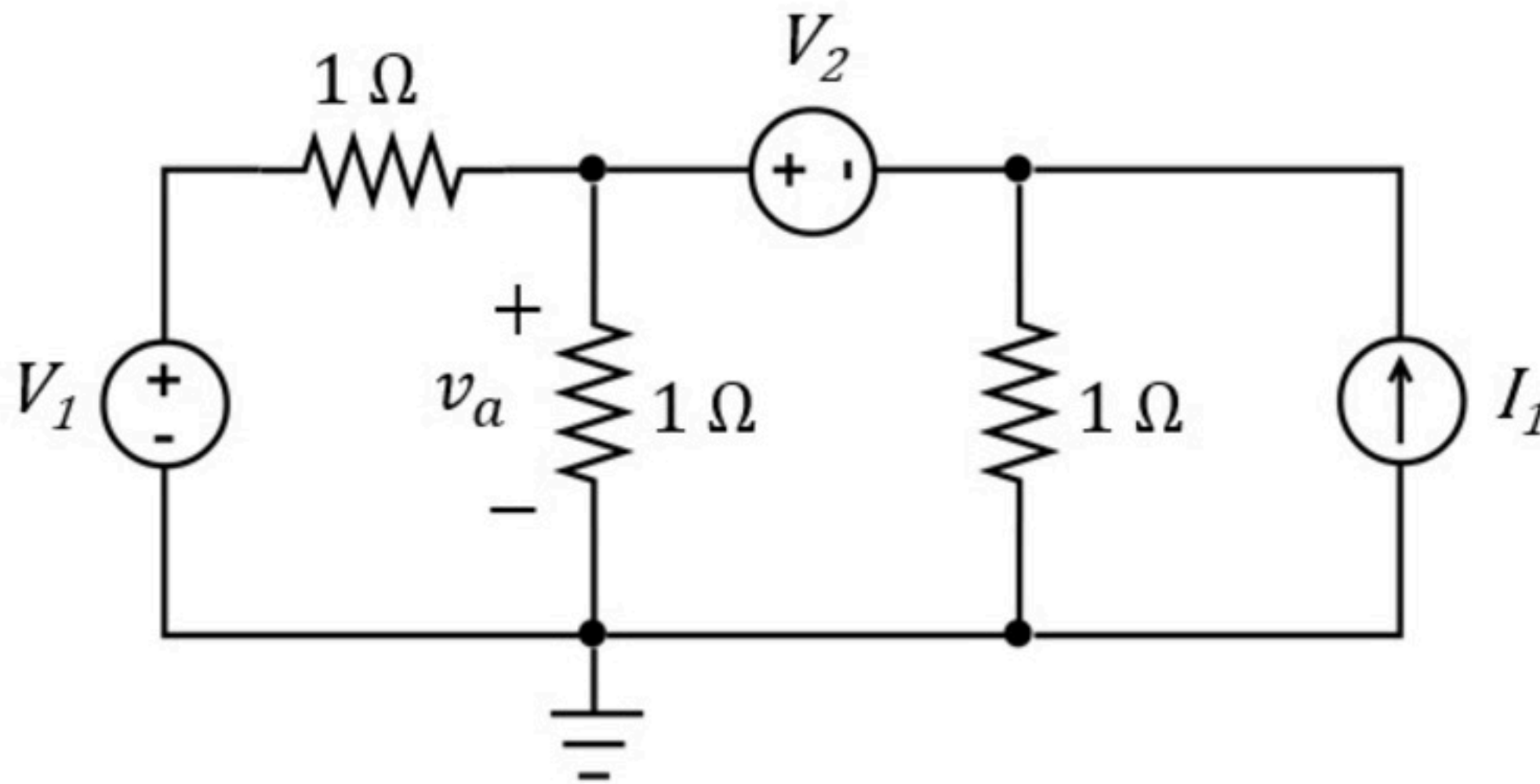


Nodal Mesh 003

Problem has been graded.

Find the voltage v_a . Use nodal analysis.



Given Variables:

V_1 : 6 V

V_2 : 10 V

I_1 : 5 A

Calculate the following:

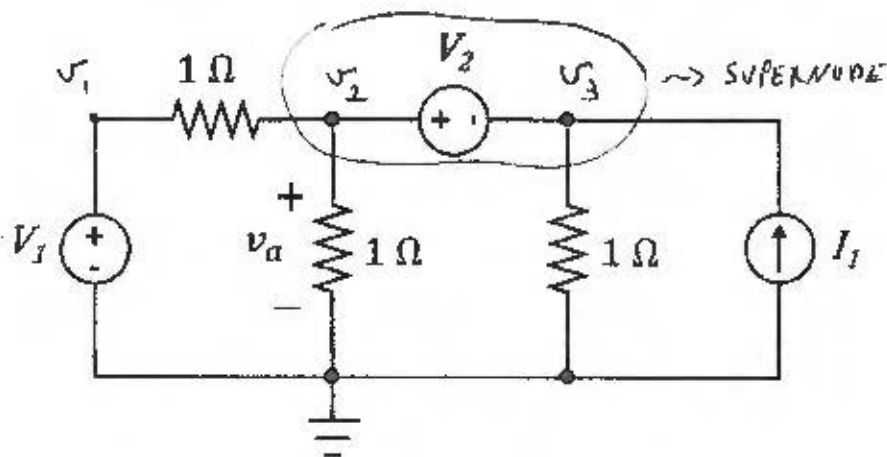
v_a (V) :

Find the voltage v_a . Use nodal analysis.

$$V_1 = 6 \text{ V}$$

$$V_2 = 10 \text{ V}$$

$$I_1 = 5 \text{ A}$$



$$v_1 = V_1 = 6 \text{ V}$$

$$\textcircled{*} \text{ KCL @ SN: } \frac{v_2 - 6}{1} + \frac{v_2}{1} + \frac{v_3}{1} - 5 = 0$$

$$\Rightarrow 2v_2 + v_3 = 11 \quad (1)$$

$$\textcircled{*} \text{ SN: } v_2 = v_3 + 10 \quad (2)$$

$$\textcircled{*} \text{ (2) in (1): } 2v_3 + 20 + v_3 = 11 \Rightarrow 3v_3 = -9 \Rightarrow v_3 = -3 \text{ V}$$

$$v_2 = 7 \text{ V}$$

$$v_a = v_2 \Rightarrow \boxed{v_a = 7 \text{ V}}$$

CHECK

KCL

AND

$$v_2 - v_3 = 10 \text{ V}$$

