

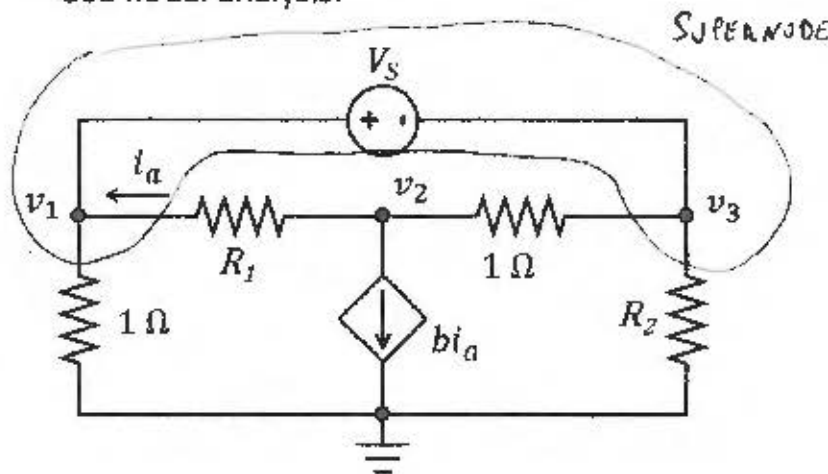
Find the node voltages v_1 , v_2 and v_3 .
Use nodal analysis.

$$V_s = 9 \text{ V}$$

$$R_1 = 5 \Omega$$

$$R_2 = 5 \Omega$$

$$b = 3 \text{ A/A}$$



OPTION 1

$$\textcircled{*} \text{ KCL @ SN: } \frac{v_1}{1} + \frac{v_1 - v_2}{5} + \frac{v_3 - v_2}{1} + \frac{v_3}{5} = 0 \Rightarrow 6v_1 - 6v_2 + 6v_3 = 0$$

$$\Rightarrow v_1 - v_2 + v_3 = 0 \quad (1)$$

$$\textcircled{*} \text{ KCL @ 2: } \frac{v_2 - v_1}{5} + \frac{v_2 - v_3}{1} + 3\left(\frac{v_2 - v_1}{5}\right) = 0 \Rightarrow -4v_1 + 9v_2 - 5v_3 = 0 \quad (2)$$

$$\textcircled{*} \text{ SN: } v_1 = v_3 + 9 \quad (3)$$

$$(3) \text{ in } (1): v_3 + 9 - v_2 + v_3 = 0 \Rightarrow -v_2 + 2v_3 = -9 \quad (4)$$

$$(3) \text{ in } (2): -4v_3 - 36 + 9v_2 - 5v_3 = 0 \Rightarrow 9v_2 - 9v_3 = 36$$

$$\Rightarrow v_2 - v_3 = 4 \quad (5)$$

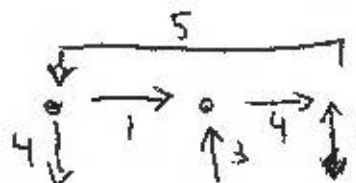
$$(4) + (5): 2v_3 - v_3 = -9 + 4 \Rightarrow v_3 = -5 \text{ V}$$

$$v_1 = 4 \text{ V} \quad \text{FROM (3)}$$

$$v_2 = -1 \text{ V} \quad \text{FROM (5)}$$

CHECK

KCL



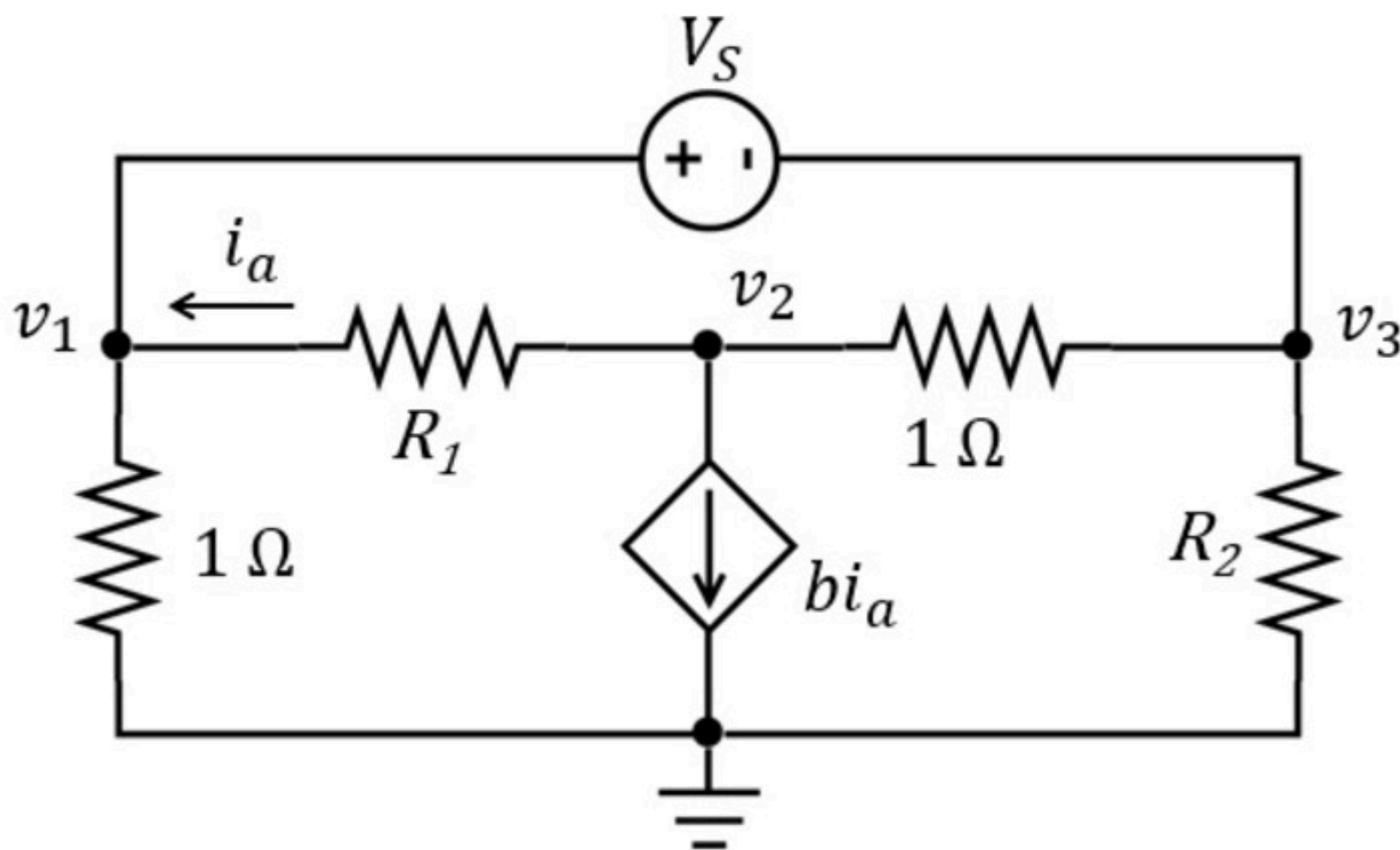
AND

$$v_1 = v_3 + 9$$

Nodal Mesh 004

Problem has been graded.

Find the node voltages v_1 , v_2 and v_3 .
Use nodal analysis.



Given Variables:

V_s : 9 V

R_1 : 5 ohm

R_2 : 5 ohm

b : 3 A/A

Calculate the following:

v_1 (V) :

v_2 (V) :

v_3 (V) :
