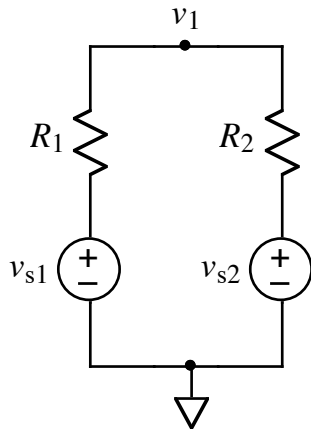


Ex:



Use the node-voltage method to find a formula for v_1 . Write your answer as a sum of a voltage divider for v_{s1} and a voltage divider for v_{s2} .

SOL'N: We sum the currents out of the v_1 node:

$$\frac{v_1 - v_{s1}}{R_1} + \frac{v_1 - v_{s2}}{R_2} = 0A$$

Note: We can use the node-voltage method even for a point in the circuit that is not the meeting point for three or more wires.

Simplifying our equation reveals that it is the sum of two voltage dividers:

$$v_1 \left(\frac{1}{R_1} + \frac{1}{R_2} \right) = \frac{v_{s1}}{R_1} + \frac{v_{s2}}{R_2}$$

or (after multiplying both sides by $\frac{R_1 R_2}{R_1 + R_2}$)

$$v_1 \frac{(R_2 + R_1)}{R_1 + R_2} = v_{s1} \frac{R_2}{R_1 + R_2} + v_{s2} \frac{R_1}{R_1 + R_2}$$