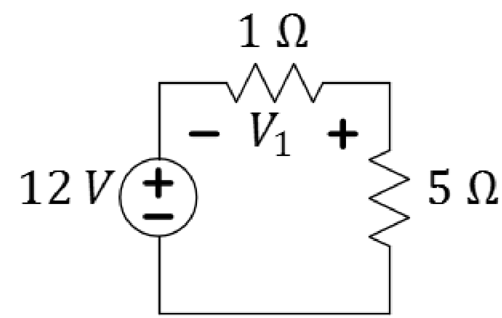
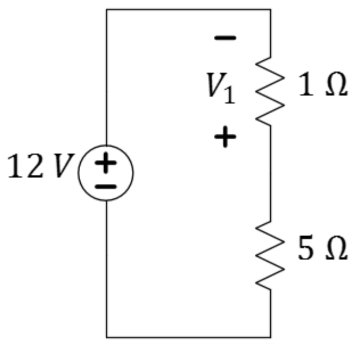
Use Voltage Divider Rule to find V_1.



<u>Step 1.</u> **Identify the series resistances** responsible for voltage drops.

The 1 Ω resistor is in series with the 5Ω resistor. This is easier to see after rearranging the sketch as shown in the second schematic.

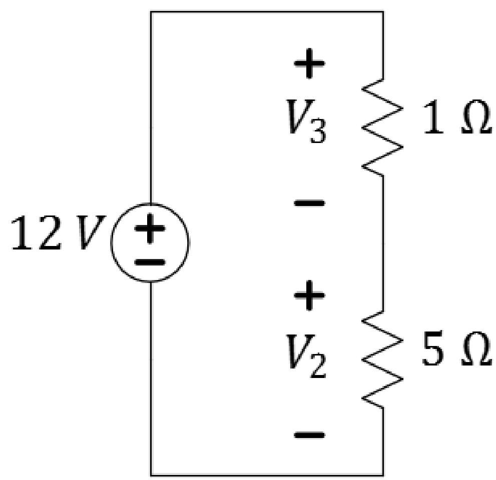


<u>Step 2.</u> **Apply KVL** to equate the sum of the voltage drops to the voltage being divided.

Voltage V_1 is in the "reverse" polarity that we typically see it. While this is not inherently a problem, it can lead to confusion in the sign of the final voltage. We will define $V_3 = -V_1$ for the comfort of the aspiring engineering student. Around the loop we get:

$$12 - V_3 - V_2 = 0$$
$$\Rightarrow V_3 + V_2 = 12$$

Which tells us that 12 V is being divided by the two resistor voltages, V_3 and V_2.



<u>Step 3.</u> **Apply VDR**.

$$V_k = \frac{R_k}{R_{eq}} V$$

$$V_3 = \frac{1}{1+5} 12 = \frac{1}{6} 12 = 2\ V$$
$$V_1 = -V_3 = -2\ V$$

Answer: $\boxed{V_1 = -2\ V}$