CONCEPTUAL TOOLS

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CIRCUITS
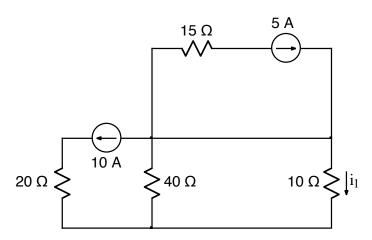
V AND I DIVIDERS
Current divider
EXAMPLE 2

Calculate i_1.

sol'n: We have a current divider consisting of the 10A src and the 40Ω and 10Ω R's in parallel.

To verify that we have a current divider, we observe that the circuit satisfies the following conditions:
i) The 10A is the total current flowing into one end of the 40Ω and 10Ω resistors, and
ii) The opposite ends of the 40Ω and 10Ω R's are connected so that the v-drop across the 10Ω and 40Ω resistors is the same.

Using the current-divider formula (with a minus sign because i_1 is measured in a direction opposite to the 10A src:

$$i_1 = -10A \cdot \frac{40\,\Omega}{40\,\Omega + 10\,\Omega} = -8A$$