

Example

Try it! (cont.)

Calculate current through each resistor.

$$R_1 = 10 \Omega, R_2 = 20 \Omega, R_3 = 30 \Omega, \mathcal{E} = 44 \text{ V}$$

Expand: R_1 and R_{23} are in series

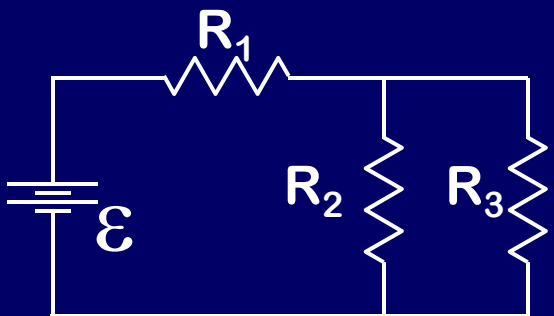
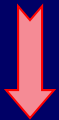
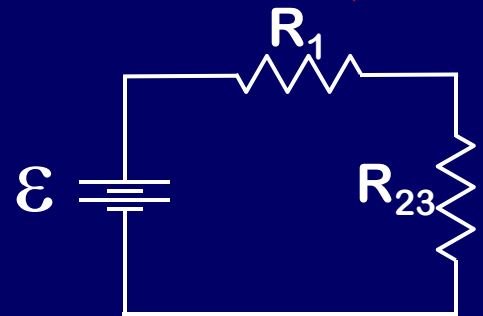
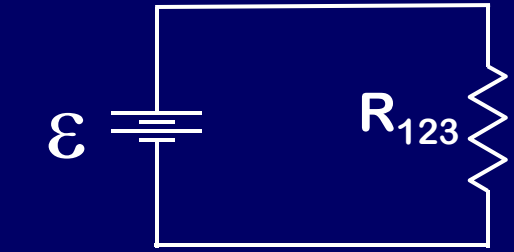
$$R_{123} = R_1 + R_{23}$$

$$: I_{23} = 2 \text{ A}$$

$$V_{123} = V_1 + V_{23} = \mathcal{E}$$

$$: V_{23} = I_{23} R_{23} = 24 \text{ V}$$

$$I_{123} = I_1 = I_{23} = I_{\text{battery}}$$



Expand: R_2 and R_3 are in parallel

$$1/R_{23} = 1/R_2 + 1/R_3$$

$$V_{23} = V_2 = V_3$$

$$I_{23} = I_2 + I_3$$

$$I_2 = V_2/R_2 = 24/20 = 1.2 \text{ A}$$

$$I_3 = V_3/R_3 = 24/30 = 0.8 \text{ A}$$