- The **voltage** across a short circuit is **zero**
- The **current** through an open circuit is **zero**
- Elements in **series** share one junction, with nothing else connected to the same junction, and they have the **same current** (KCL)
- Elements in **parallel** share two junctions, regardless of what else is connected, and they have the **same voltage** (KVL)
- Resistors in **series** add
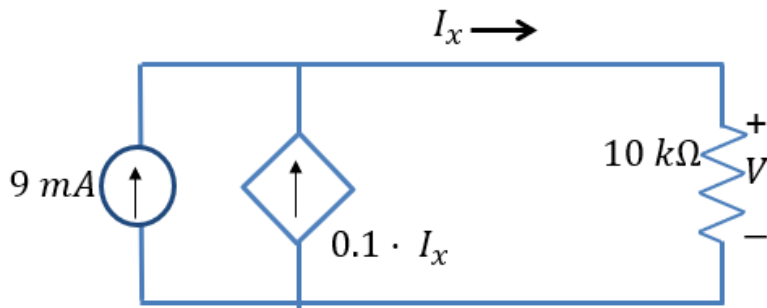- Resistors in **parallel** combine as: $R_\| = \dfrac{1}{\frac{1}{R_1}+\frac{1}{R_2}}$

Find shorts, opens, parallel, series
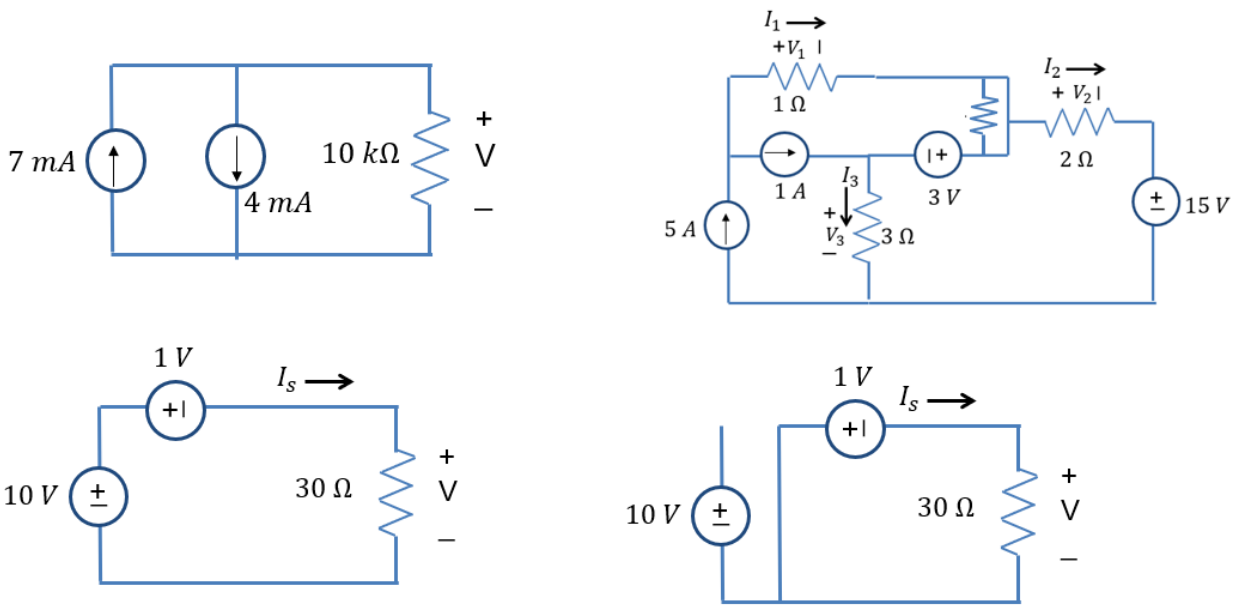
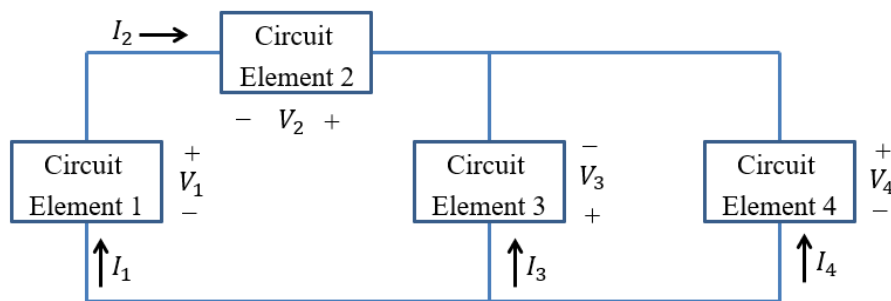Another KCL example
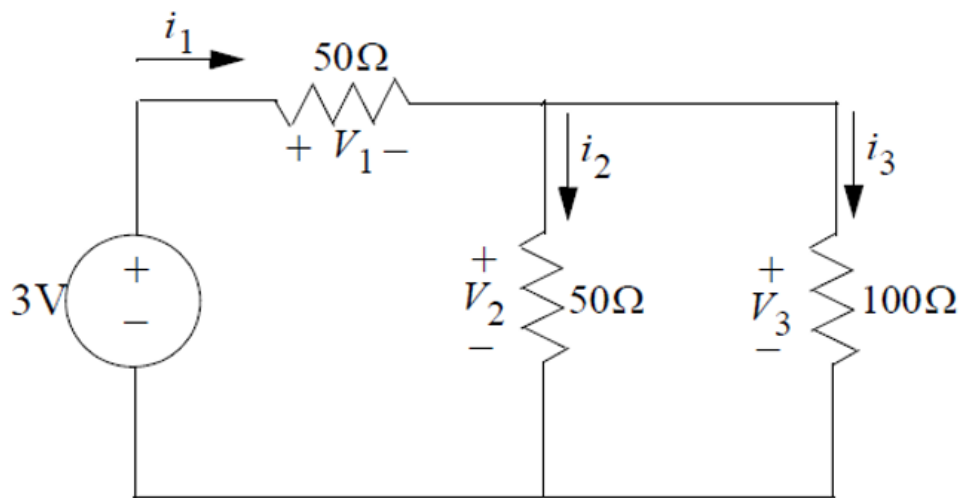
Dependent source example

$I_x \longrightarrow$

9 mA ↑   ◇↑
      $0.1 \cdot I_x$ 10 kΩ $+$ V $-$

Conservation of energy example: what power is consumed by each device?

$I_2 \longrightarrow$ Circuit Element 2
$- \; V_2 \; +$

Circuit Element 1 $+ \; V_1 \; -$

$\uparrow I_1$

Circuit Element 3 $\dfrac{-}{+} V_3$

$\uparrow I_3$

Circuit Element 4 $+ \; V_4 \; -$

$\uparrow I_4$

Element	Voltage	Current
1	3 volts	-1mA
2	-2 volts	-1mA
3	-1 volt	4mA
4	1 volt	-3mA

Element	Power
1	
2	
3	
4	

Source restrictions example: what value of V_g is necessary for the connection to be valid? With that value, what is the power associated with the 8 A current source?

$\longleftarrow i_b$

$\dfrac{i_b}{4}$ ◇ $+ \; -$ $+ \; -$ V_g ↓ 8A