Example: Write KCL for the marked node.

\[ +i_1 - i_2 - i_3 + i_4 = 0 \]

Example: Find \( i_1 \)

\[ +i_1 - (1) - (-3) + (2) = 0 \]
\[ i_1 = -4 \text{ A} \]

**Kirchhoff Voltage Law (KVL):** KVL follows from the definition of the voltage between points. Voltage is defined as the amount of energy to move unit charge from one point to another. Zero net energy should be expanded if a charge \( q \) is moved around a closed loop and is returned back to its original position, *i.e.*, 

\[ \Sigma \Delta W = q \Sigma \Delta v = 0 \quad \rightarrow \quad \Sigma \Delta v = 0 \]

**Kirchhoff Voltage Law (KVL):** Algebraic sum of all voltages around any closed path in a circuit is zero.

or Sum of voltage drops around a loop - Sum of voltage rises around a loop = 0.

**How to apply KVL**

1. You should have marked voltages and their reference directions on it.

2. Draw the loop and mark a starting point.

3. Go around the path in the clockwise direction. Whenever you go over a circuit element, write down the voltage across element with a + sign if entering the + terminal of an element and a – sign if entering the – terminal of an element.

4. Stop when you are back to the starting point (and write = 0).