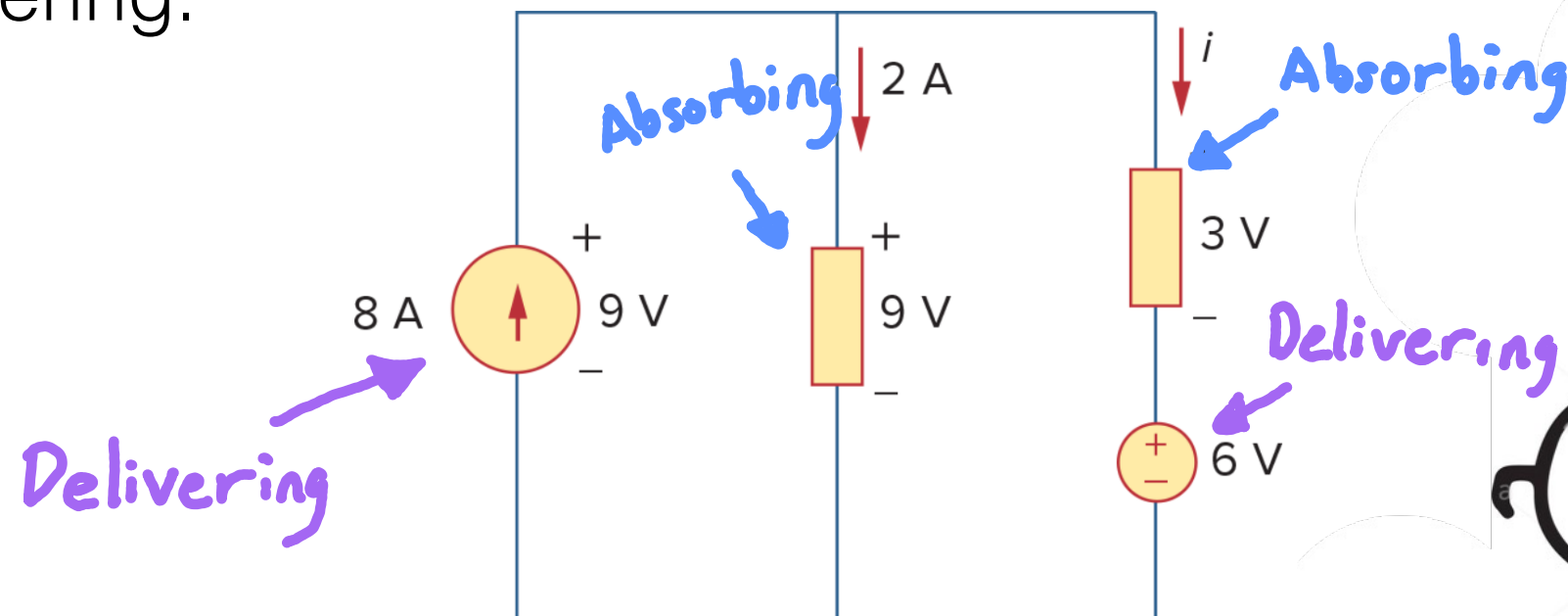


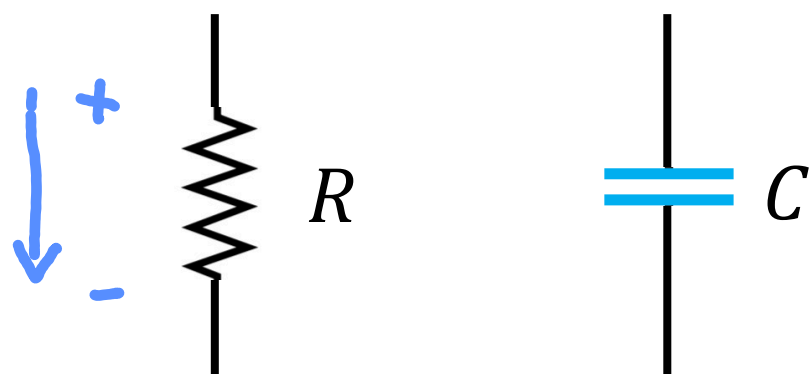


1. Determine whether each components is absorbing or delivering.

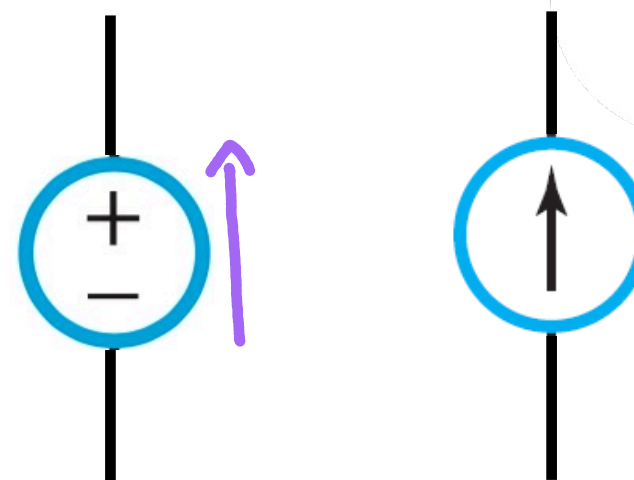


2. Draw current and Voltage across each of these components?

Passive Elements



Active Elements





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# Circuit Attributes



- Learning Objectives:
  - Identify branches, nodes, loops, and meshes in a circuit.





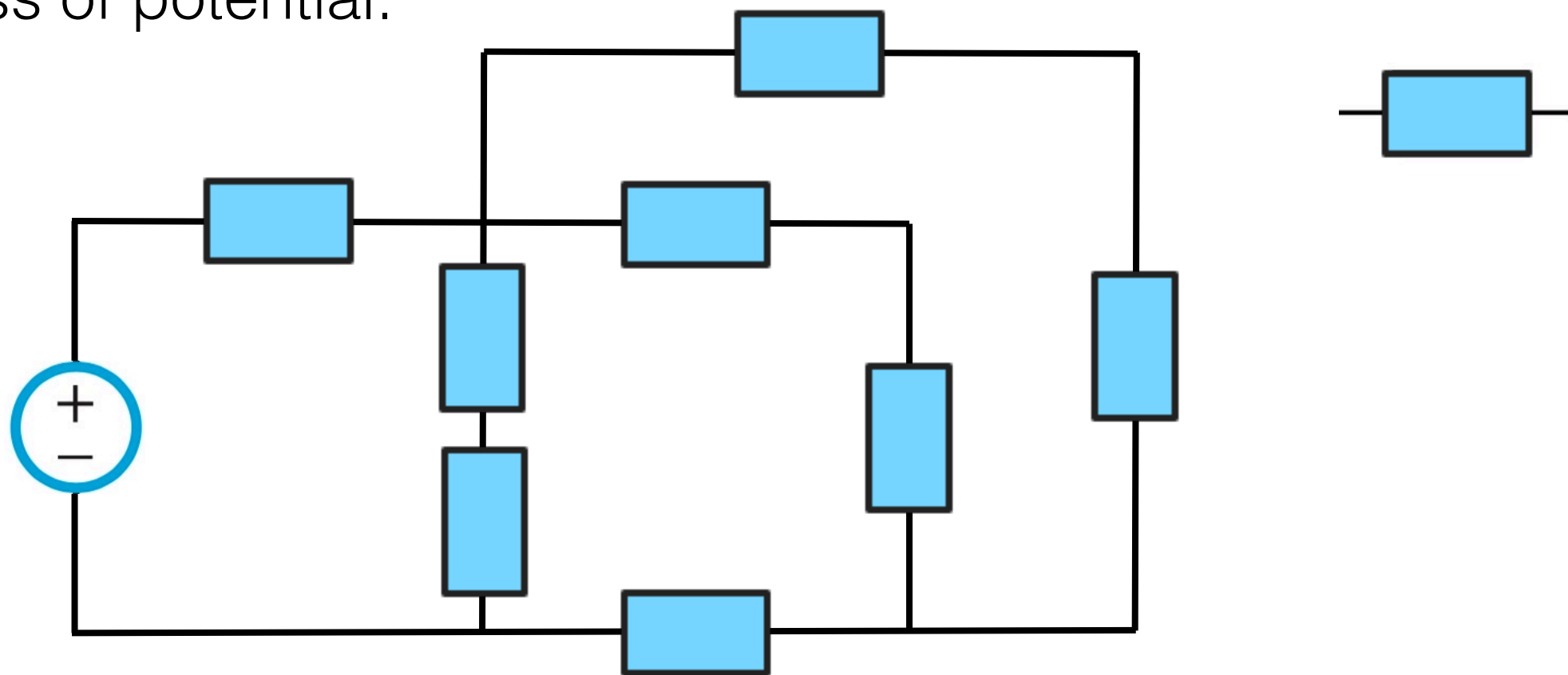
- Circuit: Electric network.

## Wires

- Ideal Wires.
- Conduct charge without loss of potential.

## Components

- Such as resistors, transistors, capacitors, inductors and diodes.

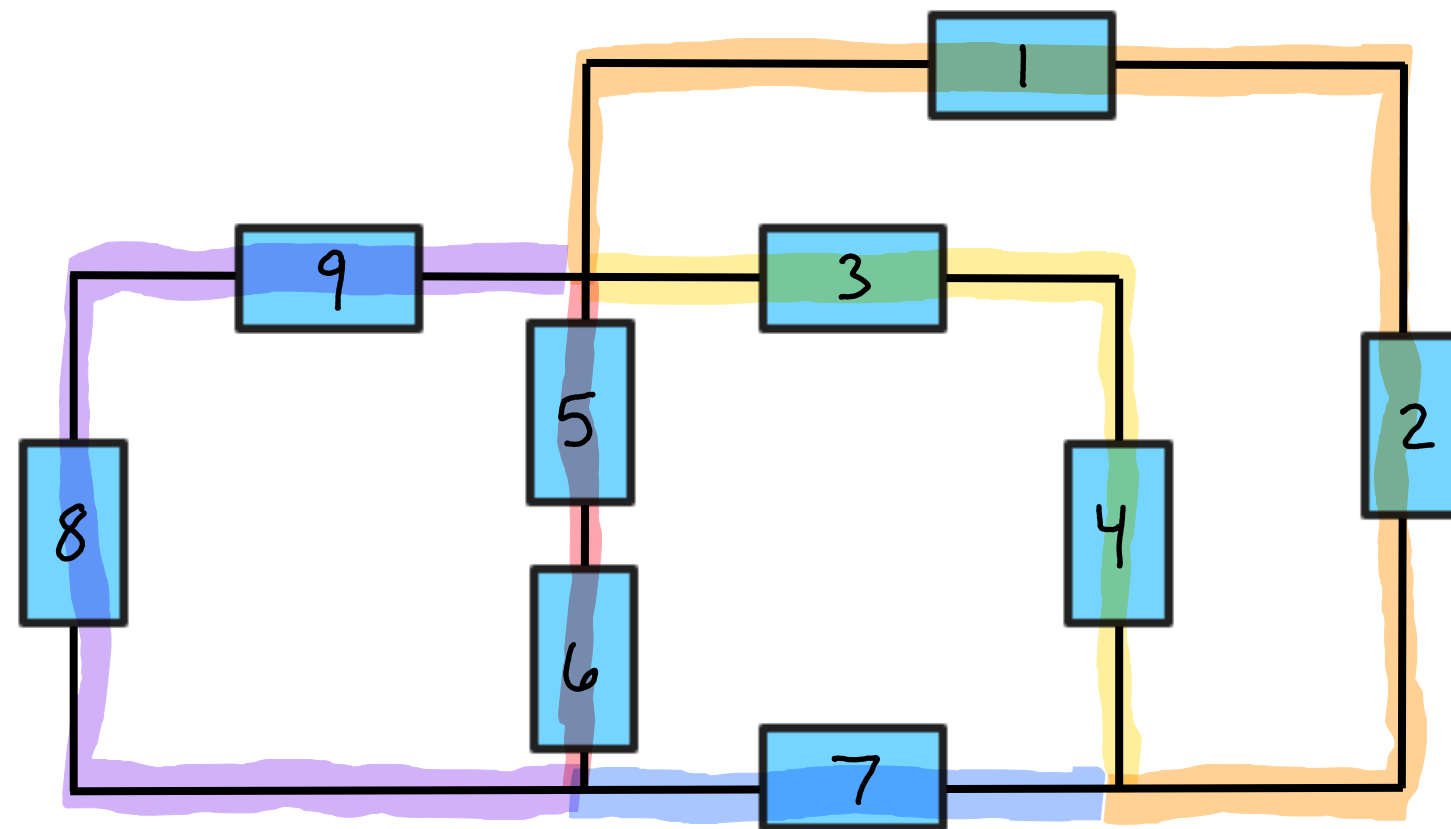


Objective of circuit analysis: Determine unknown currents and voltages.



Branch:

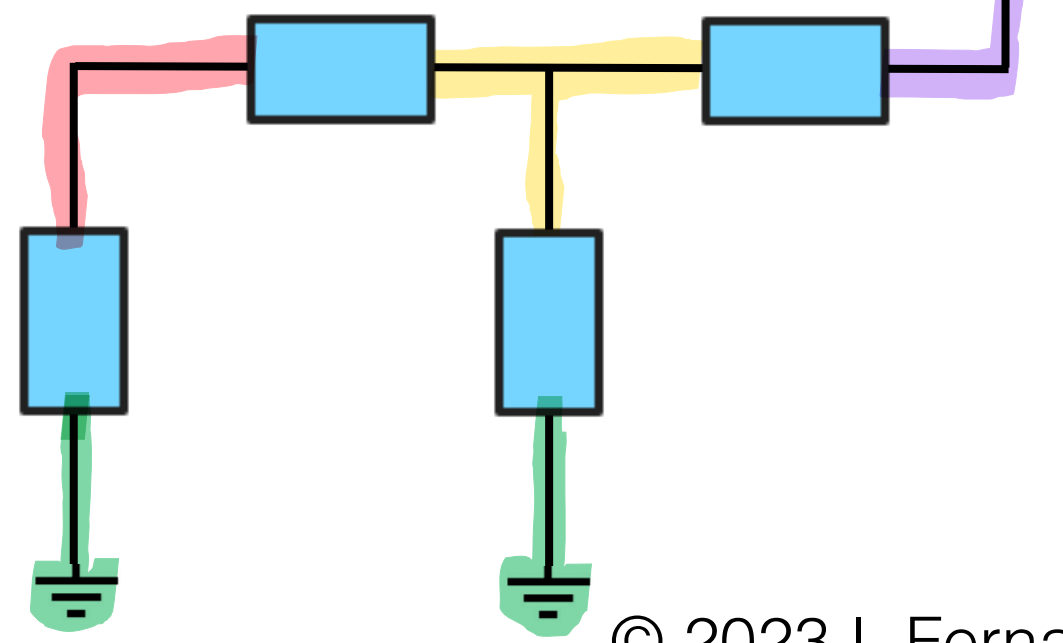
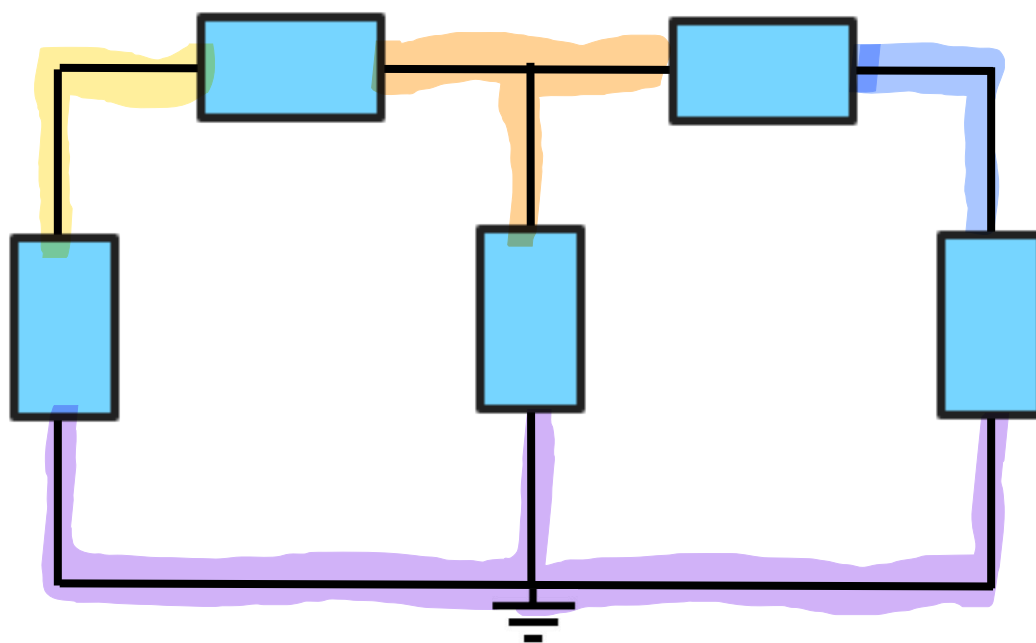
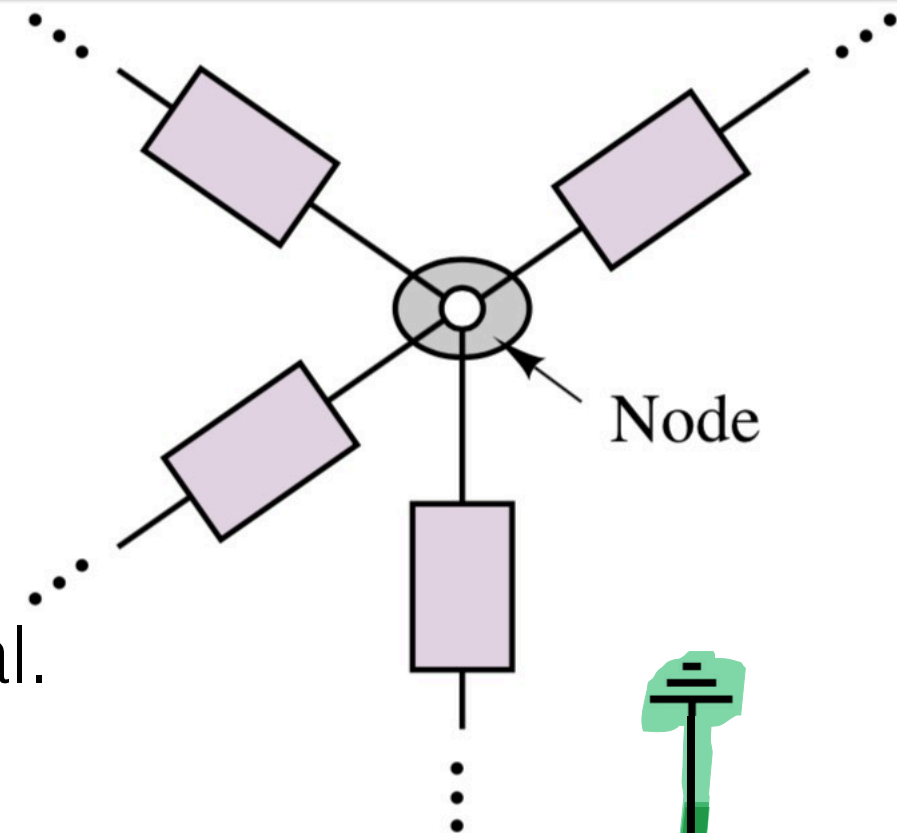
- Single electrical pathway, consisting of wires and components.
- May contain one or more components.



Components in the same branch share the same current and are said to be in series.

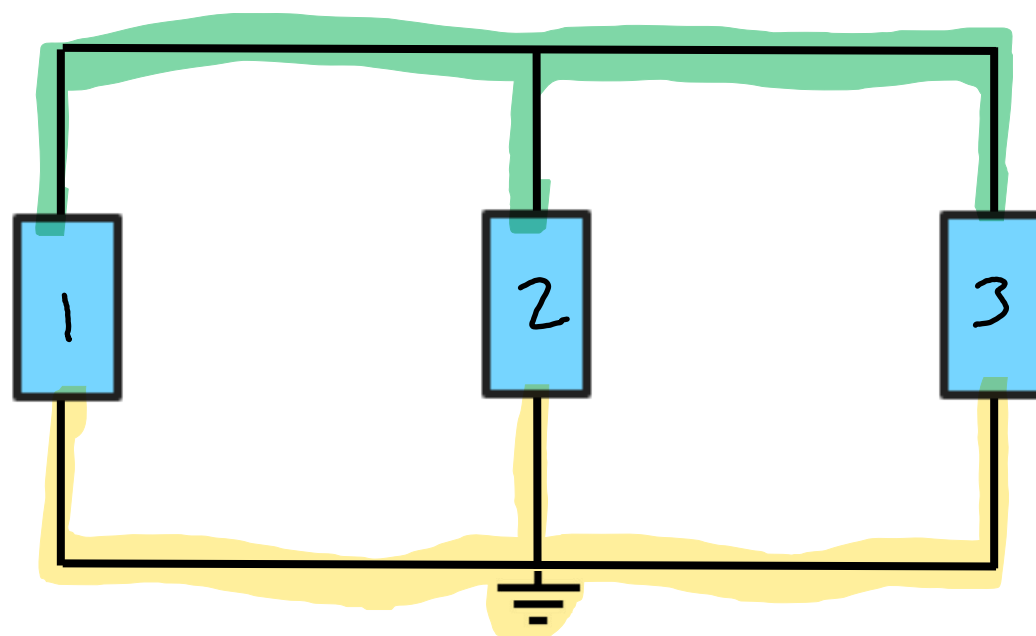
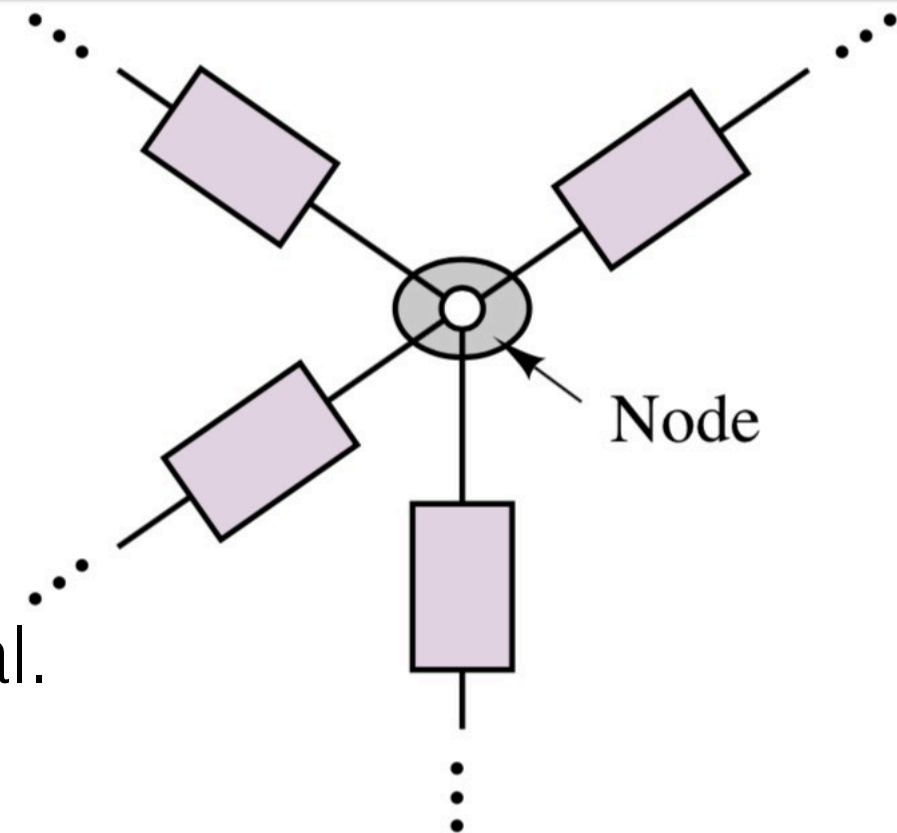
Node:

- Junction of two or more components.
- A point at which charge can flow without crossing a component.
- All points at a node have the same potential.
- Select a reference node
  - Node voltage is relative to the reference node



Node:

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- A point at which charge can flow without crossing a component.
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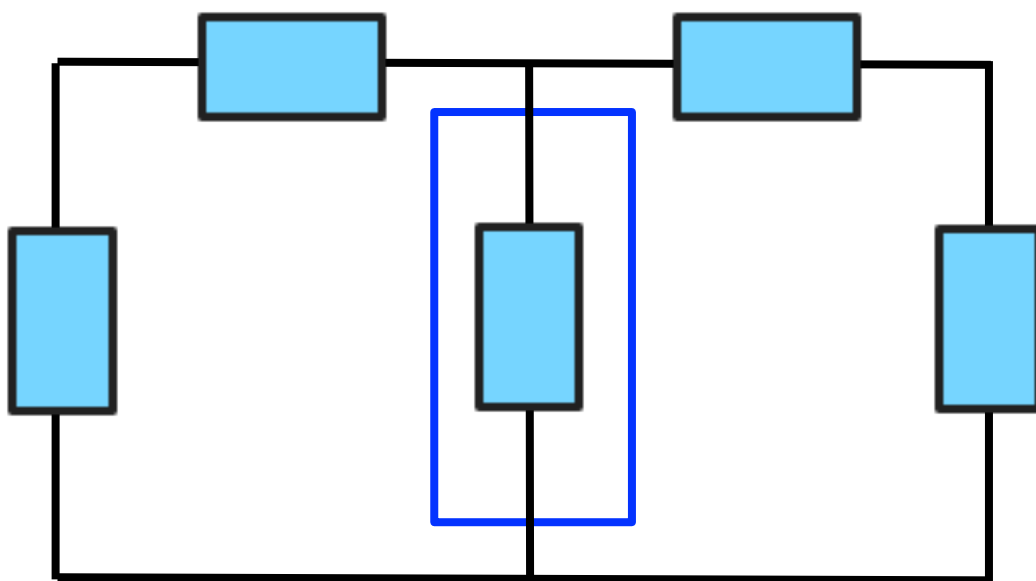


Components sharing the same nodes on both sides have the same voltage and are said to be in parallel.



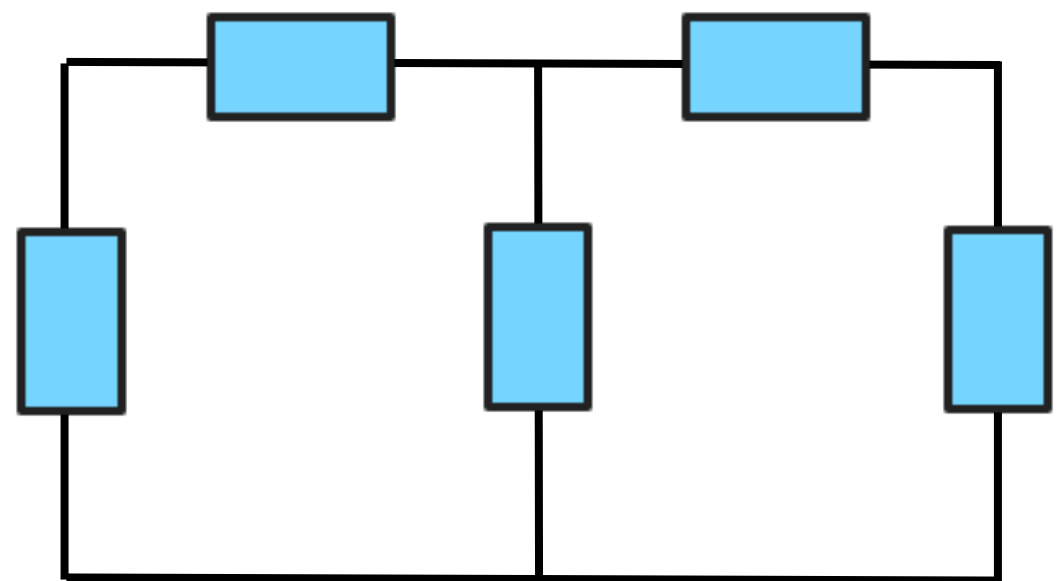
Loop:

- Any closed pathway.
- Required for current to flow.
- Different loops in the same circuit can share a branch.



Mesh:

- A mesh is a loop that does not contain other loops.



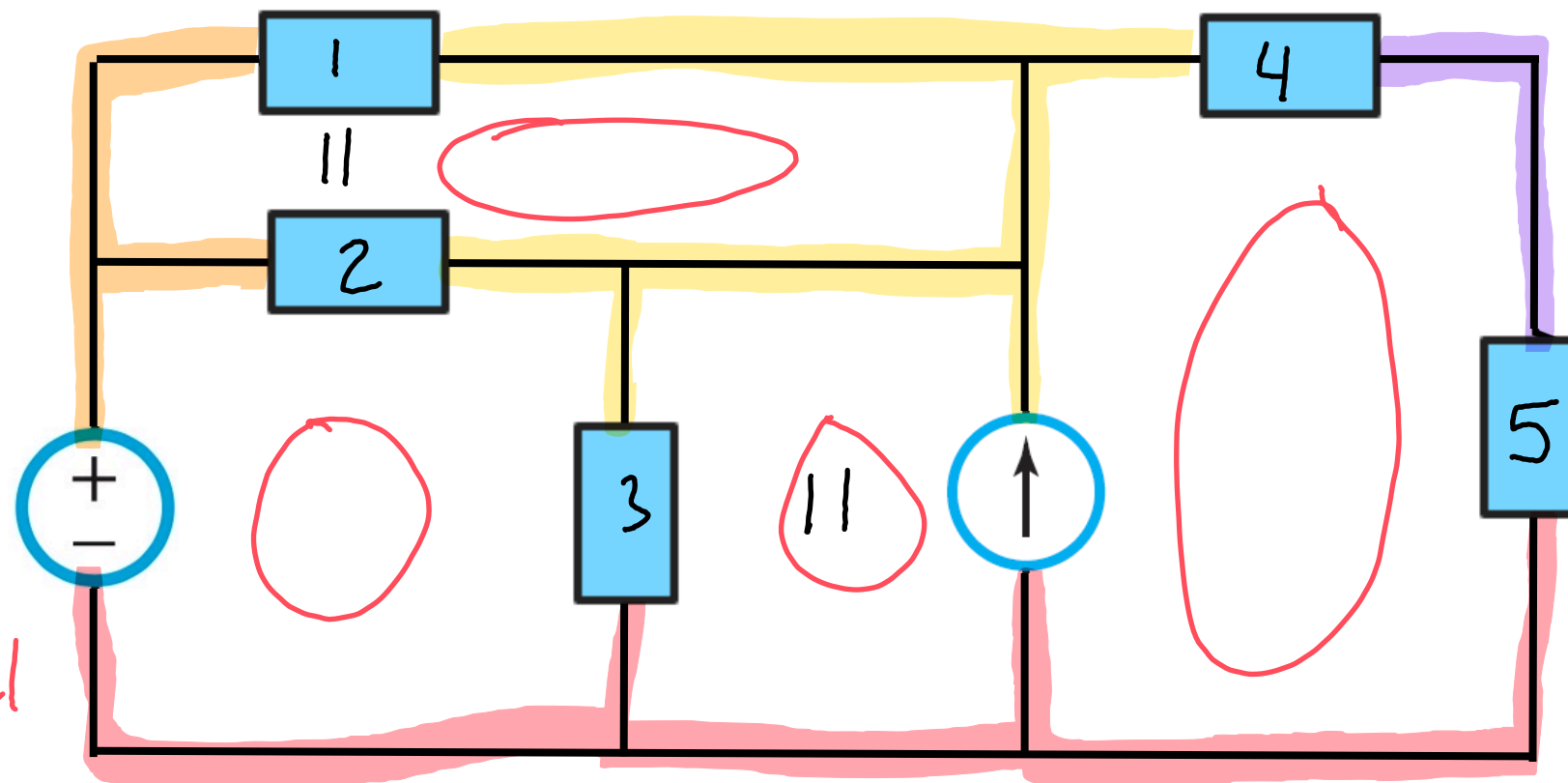




How many nodes can you identify in the circuit below?

How many meshes?

4 nodes  
4 meshes  
4, 8, 5 in series  
1, 8, 2 in parallel  
3, 8, 5, 2 in parallel





- Identify the number of nodes and meshes.

*4 nodes 5 meshes*

- Identify components that are connected in series.

*None*

- Identify components that are connected in parallel.

*12  $\Omega$  and 6  $\Omega$*

*20  $\Omega$  and 80  $\Omega$*

