**Conductance Unit [S] siemens**

For a conducting element, electrical resistance R and electrical conductance G are defined as:

\[ G = \frac{F}{V} = \frac{I}{V} = \frac{\text{current}}{\text{voltage}} \text{ [S]} \]

where R is the electrical resistance through the object and I is the resulting electrical current difference across the object.

The conductance for the conductors is defined by:

\[ [G] = \frac{[F]}{[V]} = \frac{[A]}{[V]} \]

where G is the conductance, A is the current, and V is the voltage.

For a device with a conductance of one siemens, the electric current through the device will increase by one ampere for every increase of one volt of electric potential difference across the device.

The conductance of a resistor with a resistance of five ohms, for example, is 0.2 S (5 Ω), which is equal to 200 mS.

**Ohm**

Ohm (Ω) is the unit of electrical resistance. It is defined as the resistance between two points of a conductor when a constant voltage applied between them produces a current of one ampere.

\[ I = \frac{V}{R} \]

\[ P = V \times I \]

\[ R = \frac{V}{I} \]

\[ G = \frac{1}{R} \]

\[ P = V \times I \]

\[ R = \frac{V}{I} \]

\[ G = \frac{1}{R} \]

**Mho**

Mho [mho] is the inverse of the ohm, often used in Europe. It is defined as the reciprocal of the resistance. The Mho was officially named as the mho in 1948 by the International Committee on Weights and Measures. The name mho is derived from the Greek μ (mu), the first letter of the Greek word mera, meaning "length." The Ampère-Ohm-Mho (A-Ω-mho) system of units is used in some countries, particularly in France, but it is not widely used in the United States.
Source Transformation

Thevenin's equivalent circuit

Norton's equivalent circuit

Example

Fact 1. Thevenin's and Norton's equivalent circuits are equivalent to each other.

\[ V_{oc} = \frac{V_{oc}}{R_{eq}+R_{L}} \]

\[ I_{ab} = \frac{V_{oc}}{R_{eq}+R_{L}} \]

\[ V_{oc} = \frac{V_{oc}}{R_{eq}} \]

\[ I_{ab} = \frac{V_{oc}}{R_{L}} \]

Y-Δ/Δ-Y transformation
\[ I = I_1 + I_2 \]
\[ V_8 = I \left( R_1 \parallel R_2 \right) = \frac{I \cdot R_1 \cdot R_2}{R_1 + R_2} \]
\[ \frac{1}{R_1} + \frac{1}{R_2} = \frac{R_1 + R_2}{R_1 \cdot R_2} \]