coulomb law

$$F = \frac{1}{4\pi\varepsilon} \cdot \frac{Q \cdot q}{d^2} \qquad [N]$$

$$= [\text{redacted}]\, q \cdot E$$

$$\vec{E} = q^{-1} \vec{F} = \frac{1}{q} \vec{F}$$

$$= \frac{1}{4\pi\varepsilon} \cdot \frac{Q}{d^2} \qquad [N/C]$$

$$\vec{F} = \sum_{i=0}^{n} \vec{F}_i \quad ; \quad \vec{E} = \sum_{i=0}^{n} \vec{E}_i$$

$$W_{AB} = F \cdot d \cos\alpha \qquad [J]$$

$$= q \cdot E \cdot d$$

$$= q\, U$$

$$E = \frac{U}{d} \qquad \left[\frac{V}{m}\right]$$

$$U = \frac{W_{AB}}{q} \qquad \left[\frac{J}{C}\right]$$

$$I = \frac{Q}{t} \qquad \left[\frac{C}{s}\right]$$

$$J = \frac{I}{S} \qquad \left[\frac{A}{m^2}\right]$$

$$R = \varrho \frac{l}{S} \qquad [\Omega]$$

$$R_2 = R_1 \cdot [1 + \alpha (t_2 - t_1)] \qquad [\Omega]$$

$$W = P\ t \qquad [J]$$
$$= R I^2 \cdot t$$
$$= \frac{U^2}{R} \cdot t$$

$$\eta = \frac{W_u}{W_a} = \frac{P_u}{P_a} \qquad [0-1] \quad [\times 100 - \%]$$

$$I = \frac{\Sigma E - \Sigma E'}{\Sigma R} \qquad [A]$$

Kurschhoff

$$\Sigma I_c = \Sigma I_d$$

$$\Sigma E = \Sigma (R I)$$

- teorema da sobreposicão
- teorema de Thevenin
- teorema de Norton

Only with exercises will get the drift.