



4. GAIA – ZIRKUITUETARAKO SARRERA

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Teknologia Elektronikoko Saila

5I20 – Bilboko Ingeniaritza Eskola (II Eraikina)

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GAIAREN GAI-ZERRENDAA

1. Elementu motak
2. Erresistentziak
3. Kondentsadoreak
4. Harilak
5. Sorgailuak
6. Beste elementu batzuk

1. ELEMENTU MOTAK

◦ Aktiboak

- Zirkuituko beste elementuei energia edo potentzia ematen diete
- Beste energia-mota bat gastatu behar dute
- Tentsio eta korrante-sorgailuak

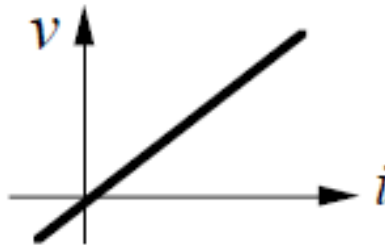
◦ Elementu pasiboak edo geldoak:

- Energia edo potentzia hartzen dute
- Energia hori guztiz beharrezkoa dute funtzionatzeko
- Erresistentziak

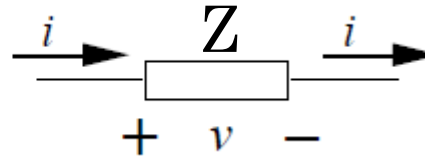
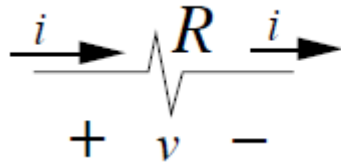
2. ERRESISTENTZIAK

◦ **Portaera:** $v = R \cdot i$ Ohm-en legea

◦ **Ezaugarri grafikoa:**



◦ **Ikurra:**



◦ **Unitatea:** Ohm, Ω

◦ **Potentzia:**

$$p = R \cdot i^2 = \frac{v^2}{R}$$

Joule efektua

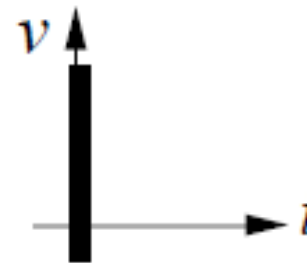
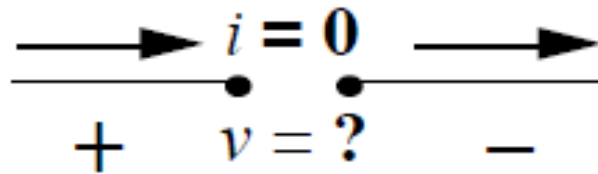


Zeinuen norantza zaindu!

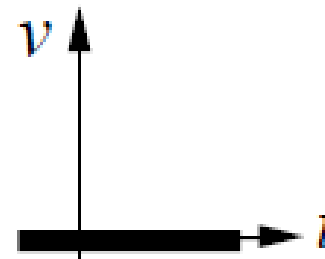
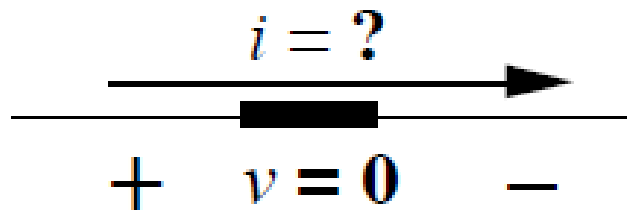
2. ERRESISTENTZIAK

◦ Kasu bereziak:

- Zirkuitu irekia: $R = \infty$



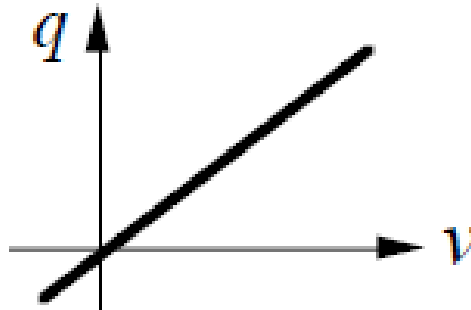
- Zirkuitulaburra: $R = 0$



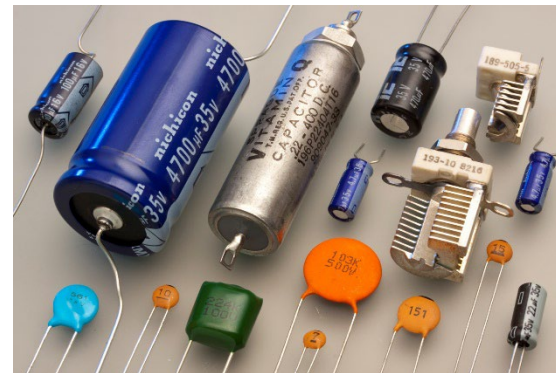
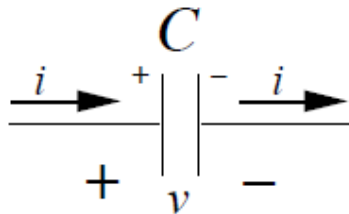
3. KONDENTSADOREAK

- **Portaera:** $q = C \cdot v$
- **Ezaugarri grafikoa**

$$i(t) = C \cdot \frac{dv(t)}{dt}$$



- **Ikurra:**

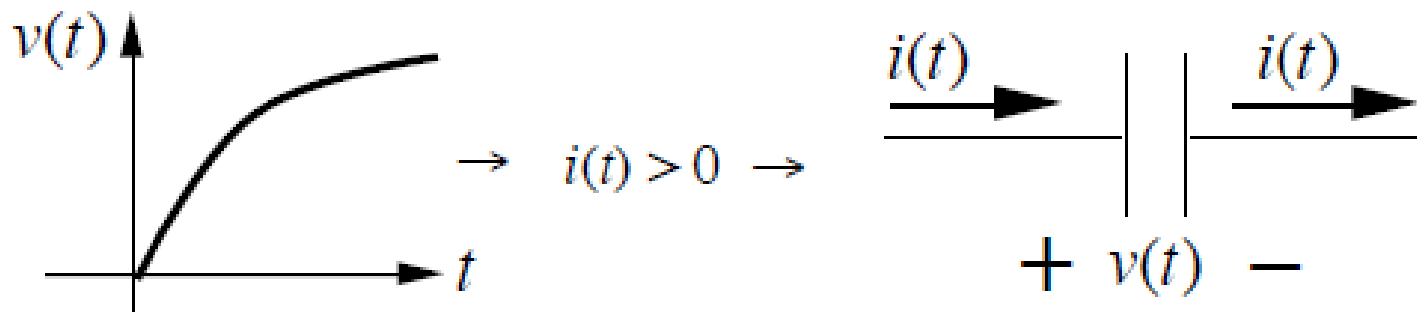


- **Unitatea:** farad, $F = 1C/1V$
- Energia metatzen dute bi xaflen arteko eremu elektrikoan

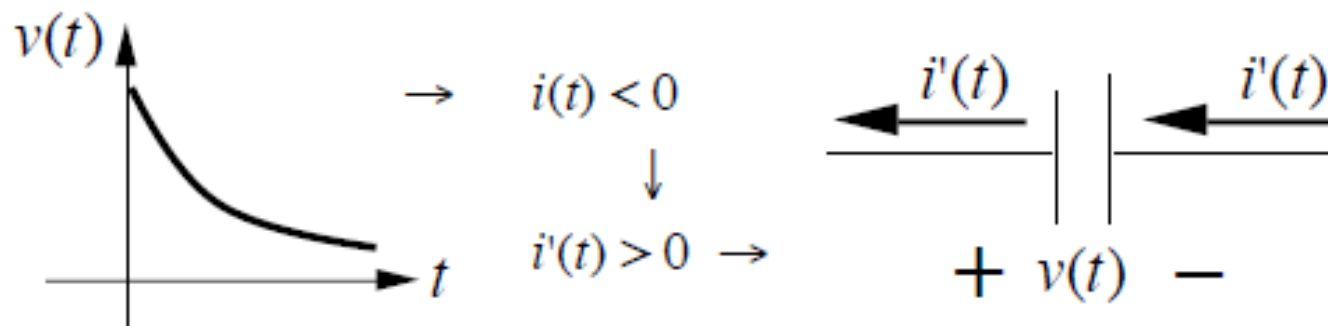
3. KONDENTSADOREAK

o Bi portaera desberdin:

- Karga-prozesua \rightarrow energia hartu



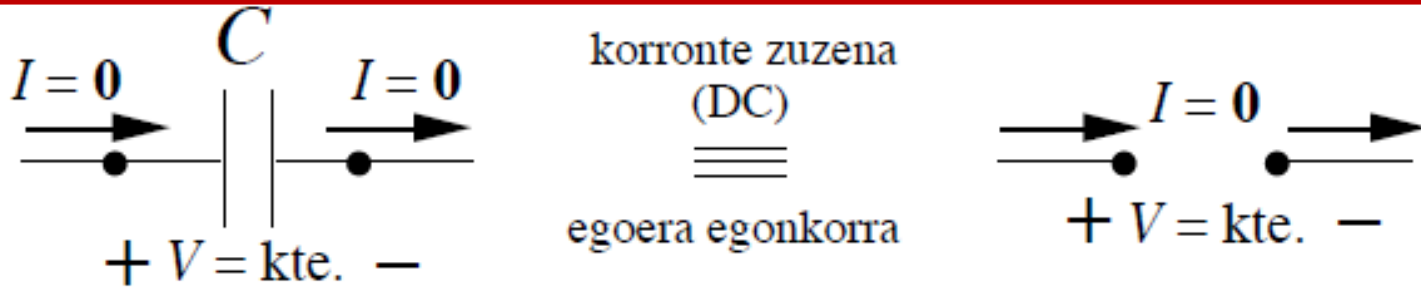
- Deskarga-prozesua \rightarrow energia eman



3. KONDENTSADOREAK

- Portaera korrante zuzena eta egoera egonkorra

- V konstantea $\rightarrow i(t) = C \cdot \frac{dv(t)}{dt} \rightarrow I = 0$



- Potentzia:

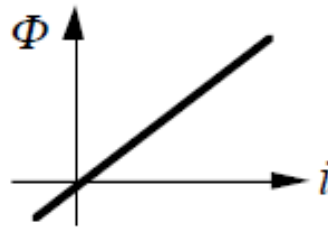
$$p(t) = v(t) \cdot i(t) = v(t) \cdot \left[C \cdot \frac{dv(t)}{dt} \right] = C \cdot v(t) \cdot \frac{dv(t)}{dt}$$

4. HARILAK

◦ **Portaera:** $\Phi = L \cdot i$

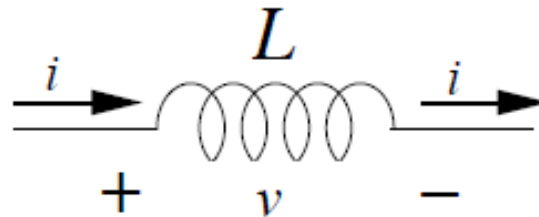
$$v(t) = L(t) \cdot \frac{di(t)}{dt}$$

◦ **Ezaugarri grafikoa:**



Φ = eremu magnetikoaren fluxua

◦ **Ikurra:**



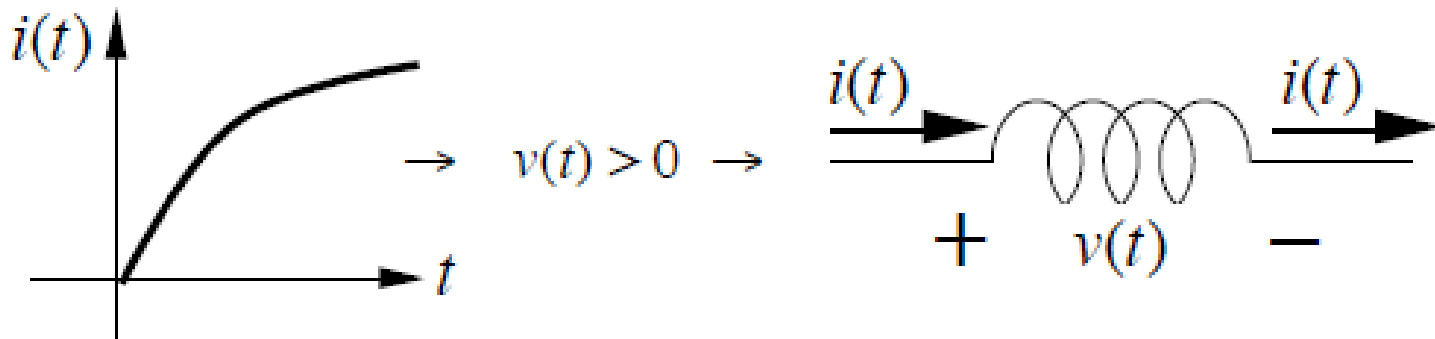
◦ **Unitatea:** henry, H

◦ Energia metatzen dute, beren barnean sortzen den eremu magnetikoan.

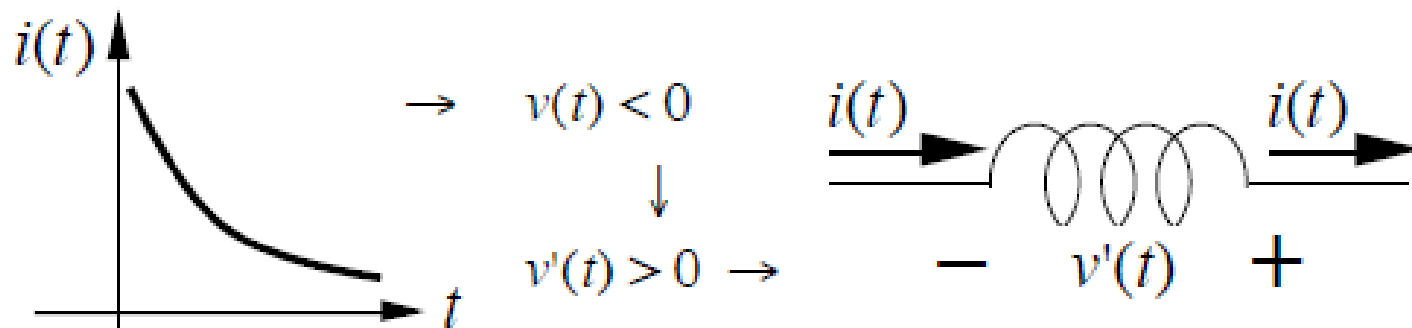
4. HARILAK

o Bi portaera desberdin:

- Karga-prozesua \rightarrow energia hartu



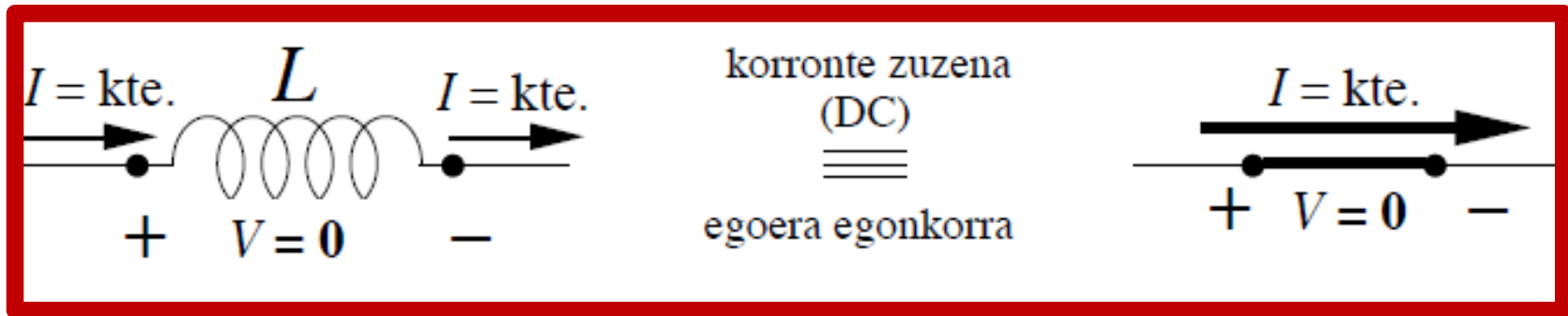
- Deskarga-prozesua \rightarrow energia eman



4. HARILAK

○ Portaera korronte zuzena eta egoera egonkorra

- I konstantea $\rightarrow v(t) = L(t) \cdot \frac{di(t)}{dt} \rightarrow V = 0$



○ Potentzia:

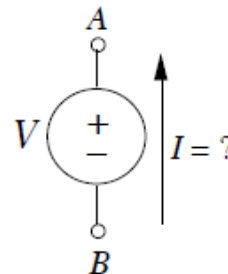
$$p(t) = v(t) \cdot i(t) = \left[L \cdot \frac{di(t)}{dt} \right] \cdot i(t) = i(t) \cdot \frac{di(t)}{dt}$$

5. SORGAILUAK

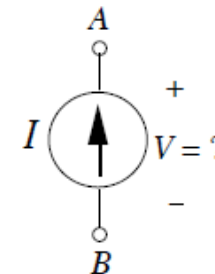
- Energia elektrikoa sortzen dute beste energia-mota bat bihurtuz (aktiboak normalean, baina pasiboak ere izan daitezke).
- Motak:
 - Tentsio sorgailua
 - Korrante sorgailua
- Portaera sailkapena
 - Independententeak
 - Menpekoak edo kontrolatuak

sorgailu independenteak:

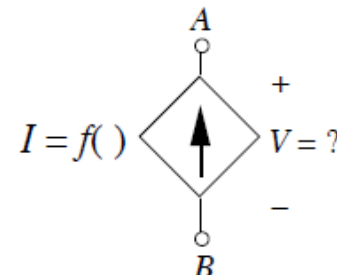
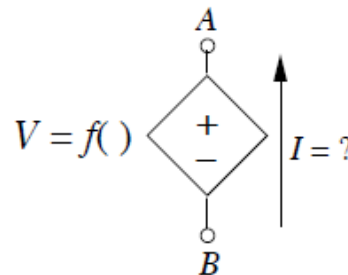
tentsio-sorgailua



korrante-sorgailua

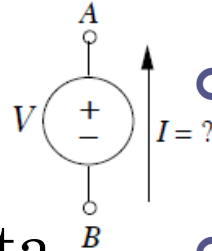


sorgailu menpekoak:



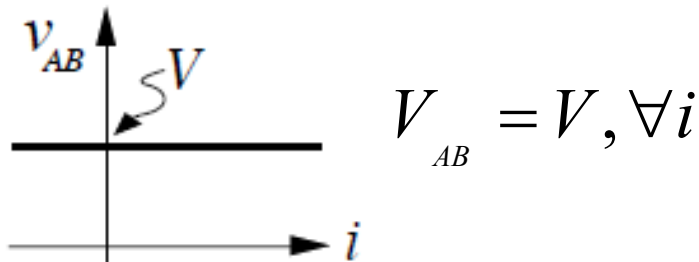
5. SORGAILUAK

- Tentsio sorgailu independenteak

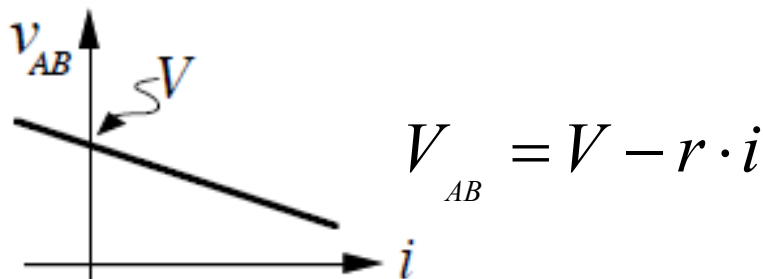


- Ezaugarri kurba eta portaera ekuazioa:

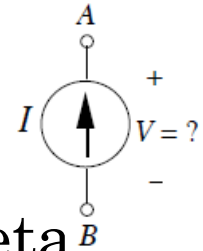
- Ideala:



- Errealak:

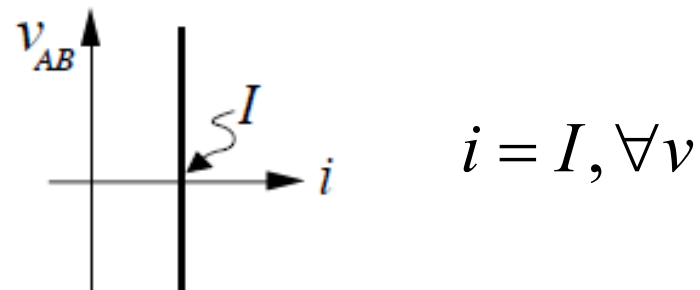


- Korrante sorgailu independenteak

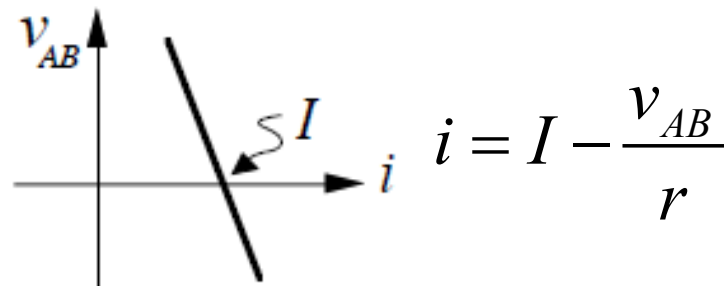


- Ezaugarri kurba eta portaera ekuazioa:

- Ideala:



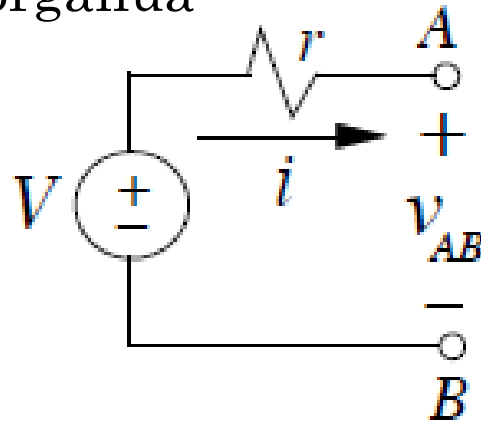
- Errealak:



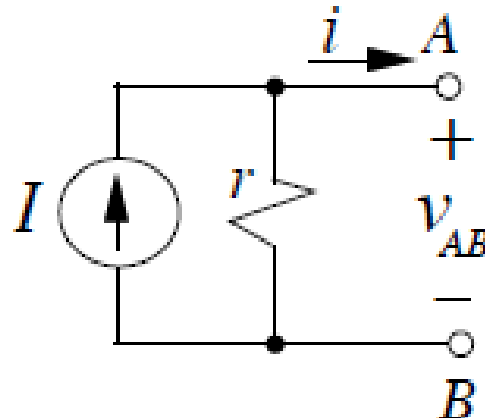
5. SORGAILUAK

- Sorgailu independente errealen zirkuitu-ereduak

- Tentsio-sorgailua



- Korronte-sorgailua



5. SORGAILUAK

- Sorgailu menpekoen portaera ekuazioa

- Tentsio-sorgailua

- Tentsioz kontrolatuta

$$V = f(V') = k \cdot V'$$

- Korrontez kontrolatua

$$V = f(I') = k \cdot I'$$

- Korronte-sorgailua

- Tentsioz kontrolatuta

$$I = f(V') = k \cdot V'$$

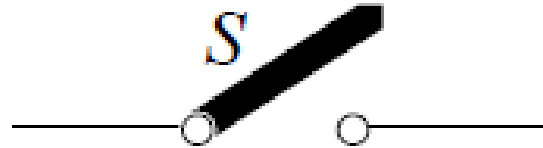
- Korrontez kontrolatua

$$I = f(I') = k \cdot I'$$

6. BESTE ELEMENTU BATZUK

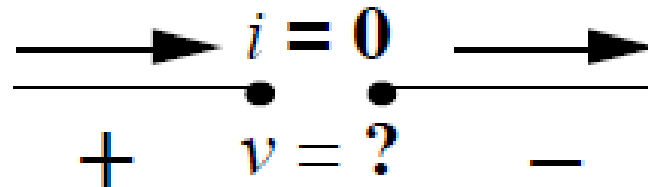
◦ Etengailu ideala

- Ikurra:



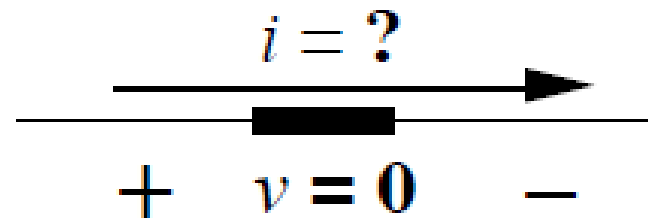
- Posizioak:

- Irekita



$$I = 0, \forall v$$

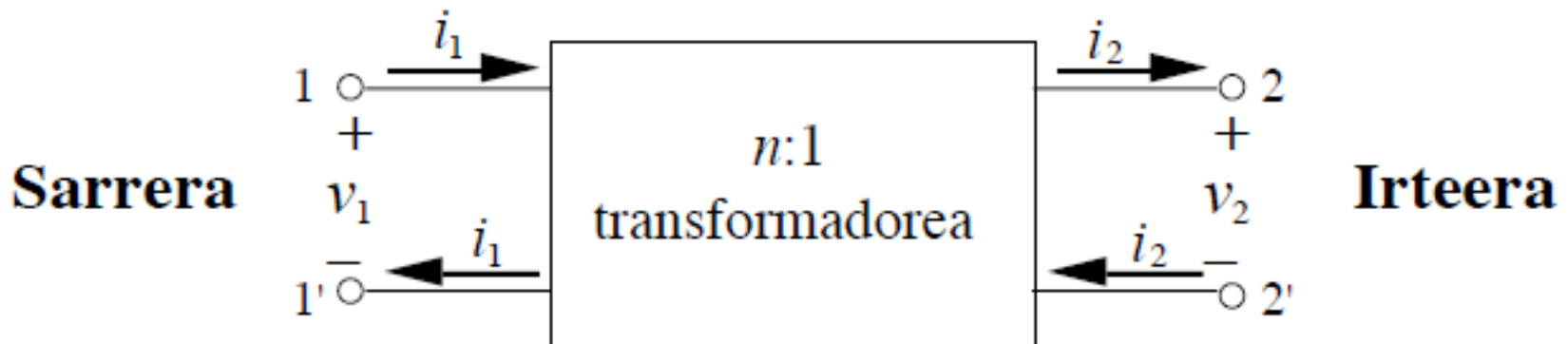
- Itxita



$$V = 0, \forall i$$

6. BESTE ELEMENTU BATZUK

o n:1 transformadorea



$$v_1 = n \cdot v_2$$

$$i_1 = \frac{i_2}{n}$$



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