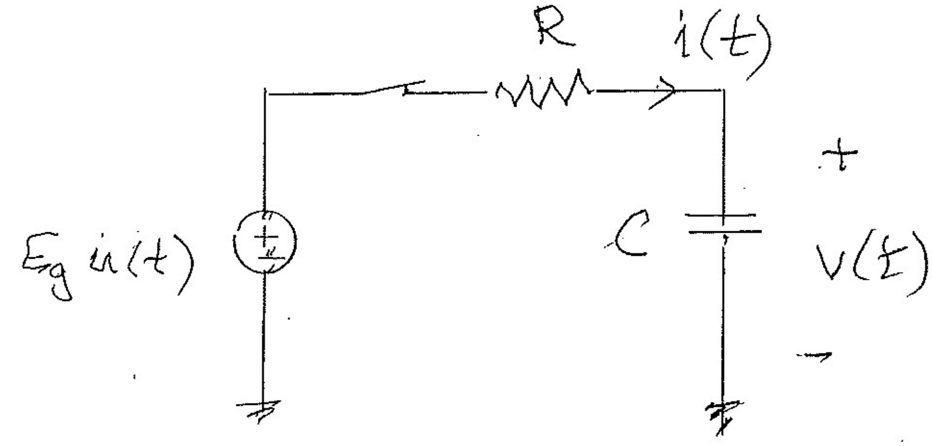


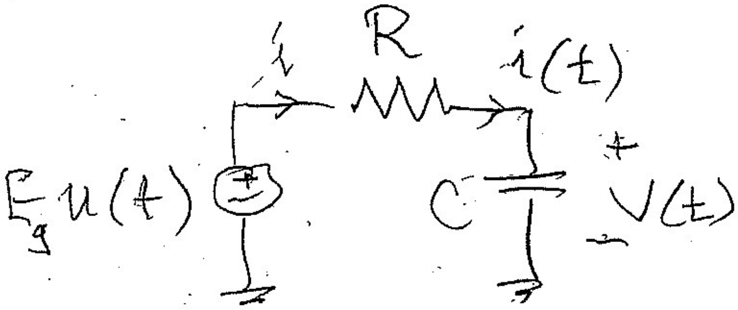
Power from generator $E_g i(t)$

Energy from gen.

$$E = E_g \int_0^\infty i(t)\,dt = E_g \left[\underbrace{q_c(\infty)}_{CE_g} - \underbrace{q_c(0)}_{0} \right]$$

$$E = E_g C\, v(\infty) = C E_g^2$$

$$E = 2 \left\{ \frac{1}{2} E_g^2 \right\} = 2 \times \text{stored energy in } C$$



$$i(t) = C\, dv/dt$$

Power from gen. $E_g i(t)$

Energy from gen.

$$E = \int_0^\infty E_g C (dv/dt)\, dt = E_g C \int_{V(0)}^{V(\infty)} dv = \underline{C E_g^2}$$

Twice the energy stored in C!

Analysis:

$$E_g \frac{1}{s} = I(s) \{ R + 1/(sC) \} \rightarrow I(s)$$

$$i(t) = (E_g/R)\, e^{-t/RC}$$

Power in R: $i^2(t) R$

Energy lost in R:

$$E_R = \int_0^\infty i^2(t) R\, dt = C E_g^2 / 2$$

Doesn't depend on R!