

## LE CONDENSATEUR

Corrigé de l'exercice 1 :

$$1. \quad I = \frac{q_A}{t}$$

$$2. \quad q_A = C \cdot u_c.$$

3. D'après la figure 2 :  $u_c = k t$

$$\text{avec } k = \frac{u_c}{t} = \frac{1,6}{1 \cdot 10^{-3}} = 1,6 \cdot 10^3 \text{ V} \cdot \text{s}^{-1}$$

$$q_A = C \cdot u_c$$

$$I t = C \cdot k t \Leftrightarrow C = \frac{I}{k}$$

$$C = \frac{3,2 \cdot 10^{-3}}{1,6 \cdot 10^3} = 2 \cdot 10^{-6} \text{ F.}$$

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4 a.  $q = C \cdot U_C$

$$q = 2 \cdot 10^{-6} \times 4 = 8 \cdot 10^{-6} \text{ C.}$$

b.  $W = \frac{1}{2} C \cdot U_C^2$

$$W = \frac{1}{2} \cdot 2 \cdot 10^{-6} \times 4^2 = 1,6 \cdot 10^{-5} \text{ J.}$$

5 a.

$$\left. \begin{array}{l} C = \epsilon \cdot \frac{S}{e} \\ C' = \epsilon \cdot \frac{S}{2e} \end{array} \right\} \Rightarrow \frac{C'}{C} = \frac{1}{2}$$

$$\Rightarrow C' = \frac{C}{2} = 10^{-6} \text{ F.}$$

$$\left. \begin{array}{l} U' = \frac{q}{C'} \\ U = \frac{q}{C} \end{array} \right\} \frac{U'}{U} = \frac{C}{C'} = 2.$$

$$U' = 2 \cdot U = 8 \text{ V.}$$

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$$b. \quad |X|' = \frac{1}{2} C' \cdot U'^2 = \frac{1}{2} \frac{C}{2} \cdot (2 \cdot U)^2$$

$$|X|' = 2 \cdot \left( \frac{1}{2} C \cdot U^2 \right) = 2 \cdot |X|$$

$$|X|' = 3,2 \cdot 10^5 \text{ J}$$