

Exercice 1*.

$$I = \frac{dQ}{dt} \rightarrow Q = \int_0^{3600} I dt = 3600 I$$

$$I = \frac{Q}{3600} = \frac{1800}{3600} = 0.5 A$$

Exercice 2.

$$Q = \int_0^{60} I dt = 60 I$$

$$Q = \int_0^{60} I dt = 60 \times 0.35 = 21 C$$

Exercice 3.

$$R = \frac{\rho L}{S} = \frac{10^{-8} \times 0.2}{10^{-6}} = 0.002 \Omega$$

Exercice 4

Soit :

$$R_1 = \frac{\rho L}{S_1} \quad , \quad R_2 = \frac{\rho L}{S_2}$$

Si R_2 est 4 fois plus petite que R_1 , alors : $R_1 = 4 R_2$

$$4R_2 = \frac{\rho L}{S_1} \quad , \quad R_2 = \frac{\rho L}{S_2}$$

On divise la 1^{ère} relation par la 2^{ème}, on obtient :

$$S_2 = 4 S_1$$

Exercice 5*.

1.

$$Q = I \cdot t = 10 \times 9 = 90 A \cdot h$$

$$Q = I \cdot t = 10 \times 9 \times 3600 = 324000 C$$

2.

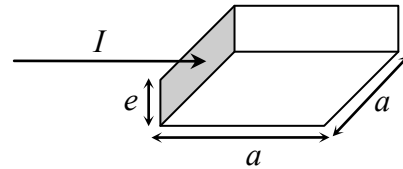
$$t = \frac{3Q}{4I} = \frac{3 \times 90}{4 \times 90} = 0.75 \text{ heure} = 45 \text{ min}$$

Exercice 6.

$$\|\vec{J}\| = \frac{I}{S} = \frac{4}{\pi d^2} = \frac{10 \times 4}{3.14 \times 2.5^2 \times 10^{-6}}$$

$$= 2.04 \times 10^6 A/m^2$$

Exercice 7*.



$$R = \frac{\rho L}{S} = \frac{\rho a}{e a} = \frac{\rho}{e}$$

D'où, R ne dépend pas de a .

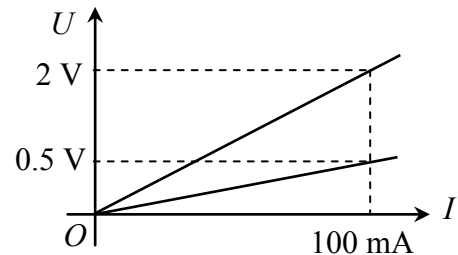
$$R = \frac{\rho}{e} = \frac{2.83 \times 10^{-8}}{5 \times 10^{-9}} = 5.66 \Omega$$

Exercice 8.

A : passif, **B** : actif linéaire, **C** : passif linéaire et symétrique.

Exercice 9*.

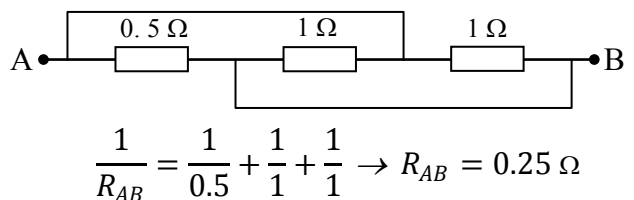
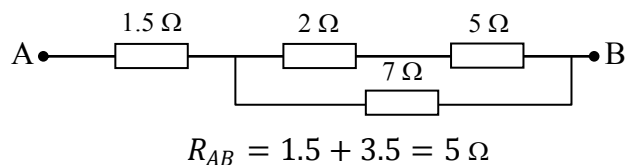
A partir de la caractéristique ci-dessous :



$$U = R \cdot I \rightarrow R = \frac{U}{I} = \frac{2}{100 \times 10^{-3}} = 20 \Omega$$

Exercice 10*.

Calculer la résistance équivalente entre A et B.



Exercice 11.

Dans le circuit série de la figure ci-dessous :

$$U_1 = R_1 \cdot I \rightarrow I = \frac{3}{1}$$

$$I = 3A$$

$$U = U_1 + U_2 + U_3$$

$$U = 3 + 9 + 12 = 24V$$

