

2011 – 2010 :			
5:	:	:	3 :
			/ :

(4) :

0.25..... : - 1

		$2 \text{H}_2\text{O}_{2(\text{aq})} = \text{O}_{2(\text{g})} + 2 \text{H}_2\text{O}_{(\text{l})}$		
		mol		
	0	CV	0	
	x	CV - 2 x	x	
	x _f	CV - 2 x _f	x _f	

: - 2

0.5..... $x_{\text{max}} = \frac{2,5 \times 24 \cdot 10^{-3}}{2} = 3 \cdot 10^{-2} \text{ mol} : \quad \text{CV} - 2x = 0 :$

$n_{\text{O}_2} = x(t) : - 3$

0.25..... $x(t) = \frac{V_{\text{O}_2}}{V_{\text{M}}} :$

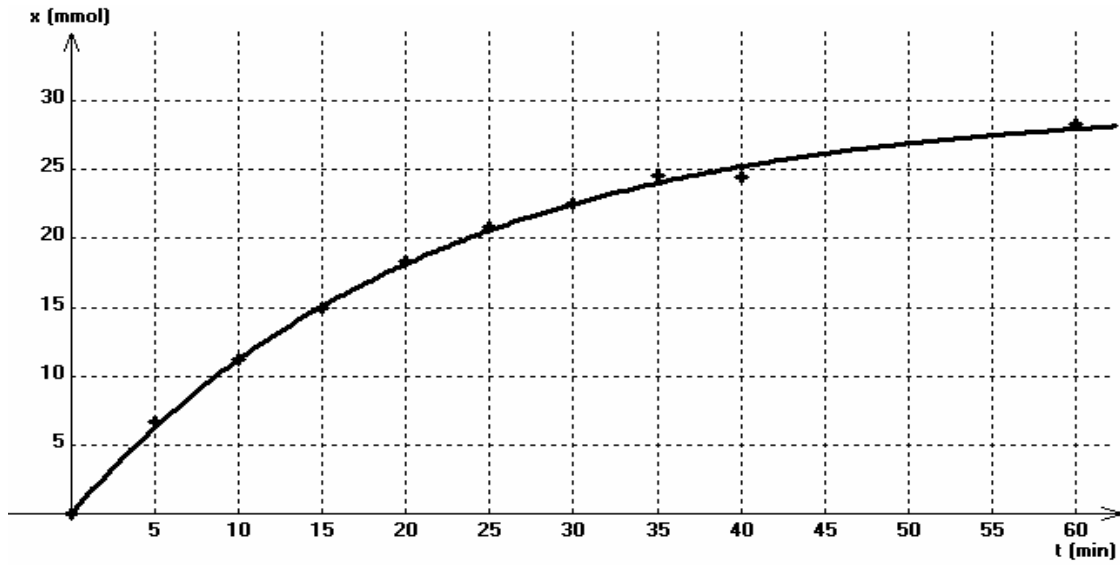
- II

0.5..... : - 1

t (min)	0	5	10	15	20	25	30	35	40	60
x (t) (mmol)	0,00	6,67	11,25	15,00	18,33	20,83	22,50	24,58	24,42	28,33

0.5.....

- 2



0.25.....

X_f

- 3

0.25..... $t_{1/2} = 15 \text{ min}$:

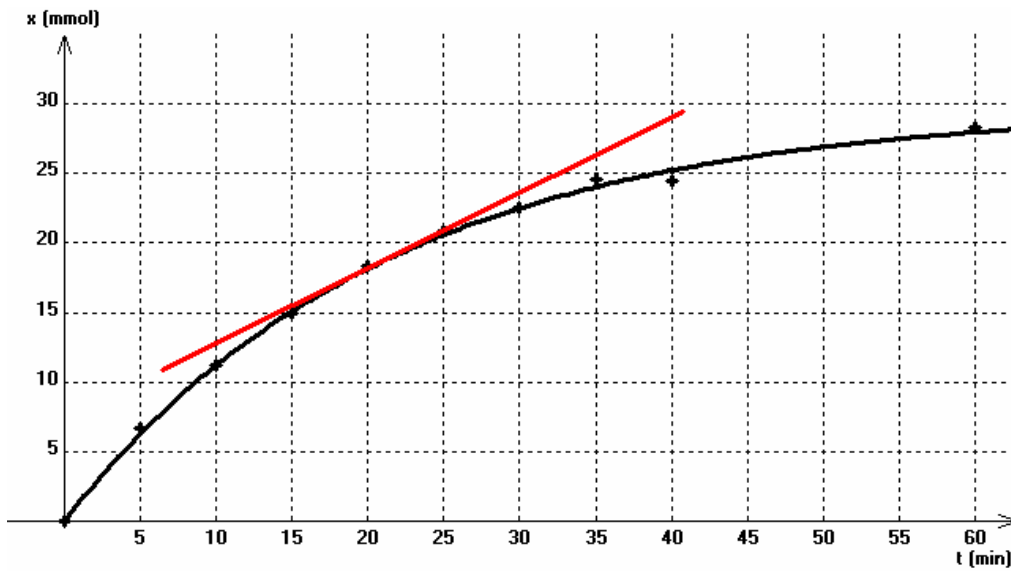
0.25..... $v = \frac{dx}{dt}$:

- 4

0.25.....

- 5

0.25..... $t = 20 \text{ min}$



0.25..... $v = \left(\frac{dx}{dt} \right)_{t=20 \text{ min}} = 0,57 \text{ mmol/min}$

:

- 6

0.25.....

- 7

0.25.....

- :

- 8

(4) :

- 1

0.25.....

0.25..... :

- 2

. A

-

. Z

-

0.25..... ${}_{92}^{238}\text{U} \rightarrow {}_2^4\text{He} + {}_{90}^{234}\text{Th}$:

- II

0.25..... ${}_{90}^{234}\text{Th} \rightarrow {}_{91}^{234}\text{Pa} + {}_{-1}^0\text{e}$:

- 1

0.25..... β^-

- 2

0.25..... 6 β 8 α

- III

- IV

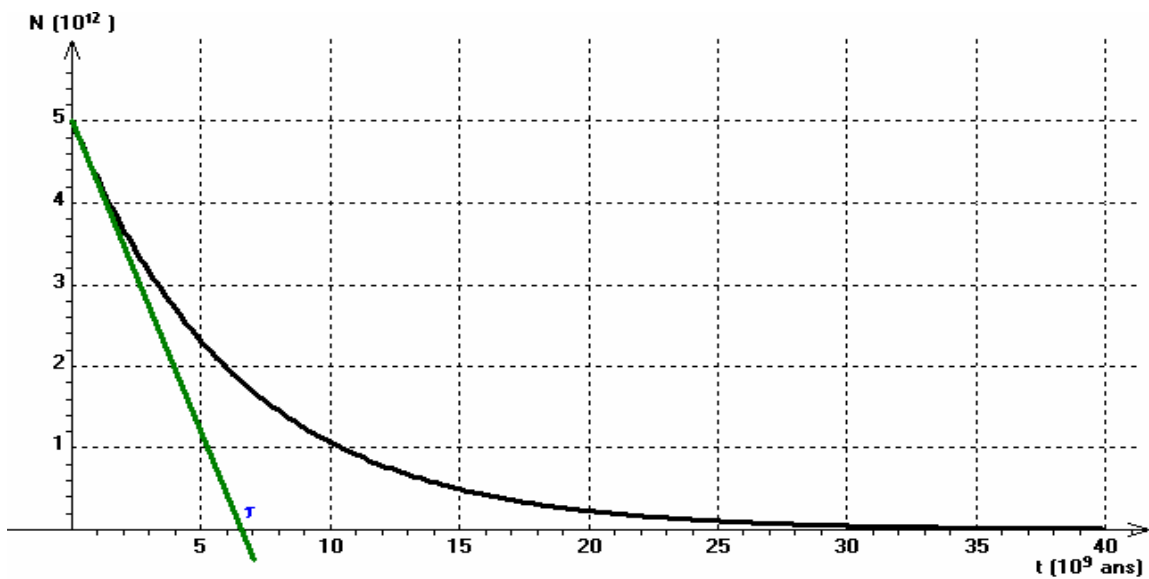
0.25..... $N_{\text{U}}(0) = 5 \cdot 10^{12}$ Noyaux :

/ - 1

$t = 0$

/

. τ



0.25..... $\tau = 6,5 \cdot 10^9$ ans :

$\lambda = \frac{1}{\tau} = 1,5 \cdot 10^{-10} \text{ ans}^{-1}$:

0.25..... $\frac{dN_U(t)}{dt} + \lambda \cdot N_U(t) = 0$ - 2

0.25..... $N_U(t) = N_U(0) \cdot \exp(-\lambda \cdot t)$:

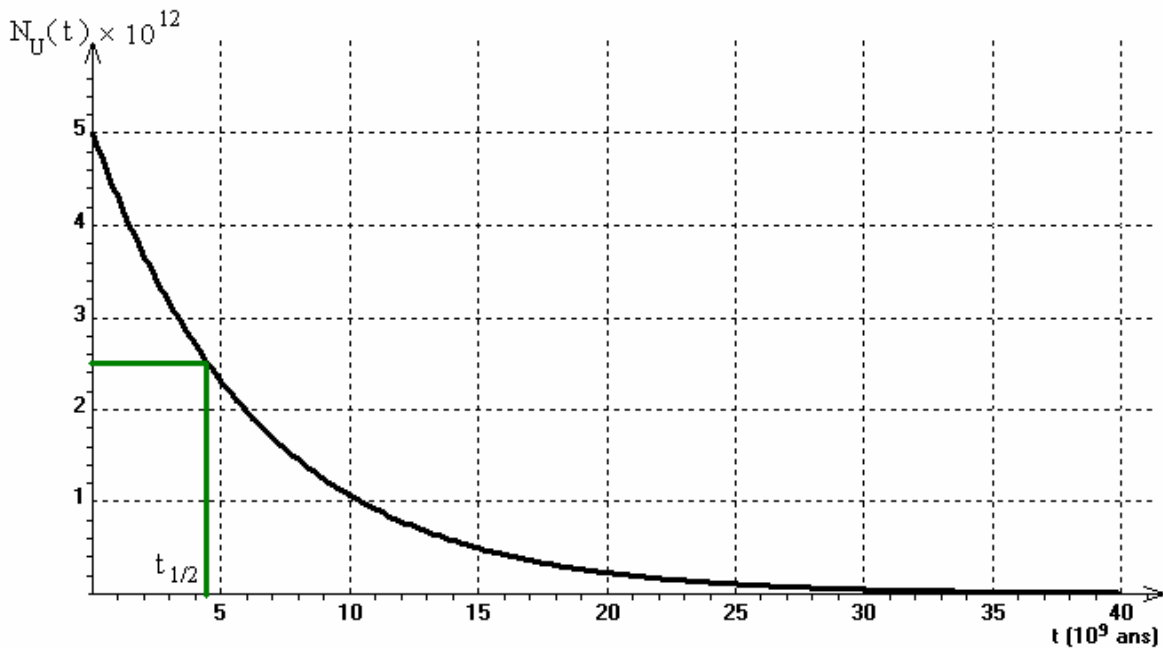
: $t = 1,5 \cdot 10^9$ ans - 3

0.25..... $N_U(t) = 5 \cdot 10^{12} \cdot \exp(-1,5 \cdot 10^{-10} \times 1,5 \cdot 10^9) = 4 \cdot 10^{12}$ Noyau - 4

0.25.....

0.25..... $N_U(t_{1/2}) = \frac{N_U(t=0)}{2}$ $t_{1/2}$

0.25..... $t_{1/2} = 4,5 \cdot 10^9$ ans :



0.25..... $N_U(0) = N_U(\text{Terre}) + N_{Pb}(\text{Terre})$: / - 5

$N_U(\text{Terre}) = N_U(0) - N_{Pb}(\text{Terre})$:

:

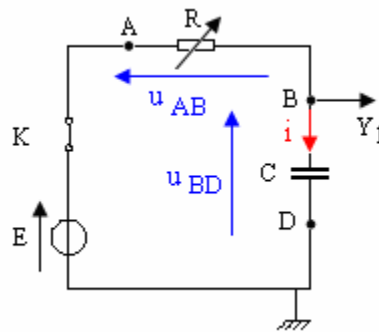
$N_U(\text{Terre}) = 5 \cdot 10^{12} - 2,5 \cdot 10^{12} = 2,5 \cdot 10^{12}$ Noyaux

0.25..... $t_{\text{Terre}} = 4,5 \cdot 10^9$ ans /

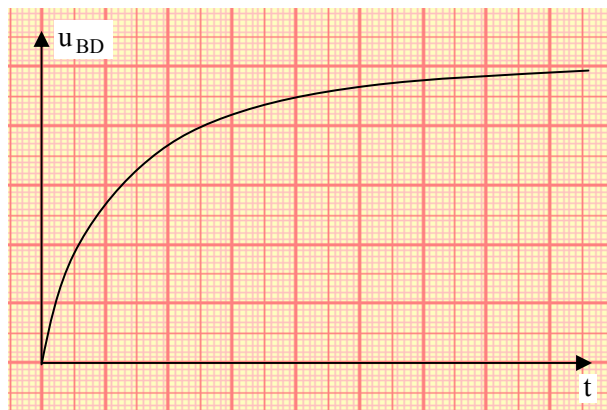
(4) :

0.25..... - 1

0.25..... - 2



0.5..... - 3



: - 4

0.25..... $E = u_{AB} + u_{BD}$:

$$: \quad u_{AB} = Ri$$

$$E = RC \frac{du_{BD}}{dt} + u_{BD}$$

0.25..... $\frac{E}{RC} = \frac{du_{BD}}{dt} + \frac{u_{BD}}{RC}$:

$$RC$$

$$u_{BD} = E (1 - \exp (- t / \tau)) \quad - 5$$

:

0.25..... $\frac{E}{RC} = \left(\frac{E}{\tau} \exp(-t/\tau) \right) + \frac{E}{RC} (1 - \exp(-t/\tau))$

:

$$\frac{E}{RC} = \frac{E}{\tau} \exp(-t/\tau) + \frac{E}{RC} - \frac{E}{RC} \exp(-t/\tau)$$

$$0 = \frac{E}{\tau} \exp(-t/\tau) - \frac{E}{RC} \exp(-t/\tau)$$

0.25..... $\tau = RC$

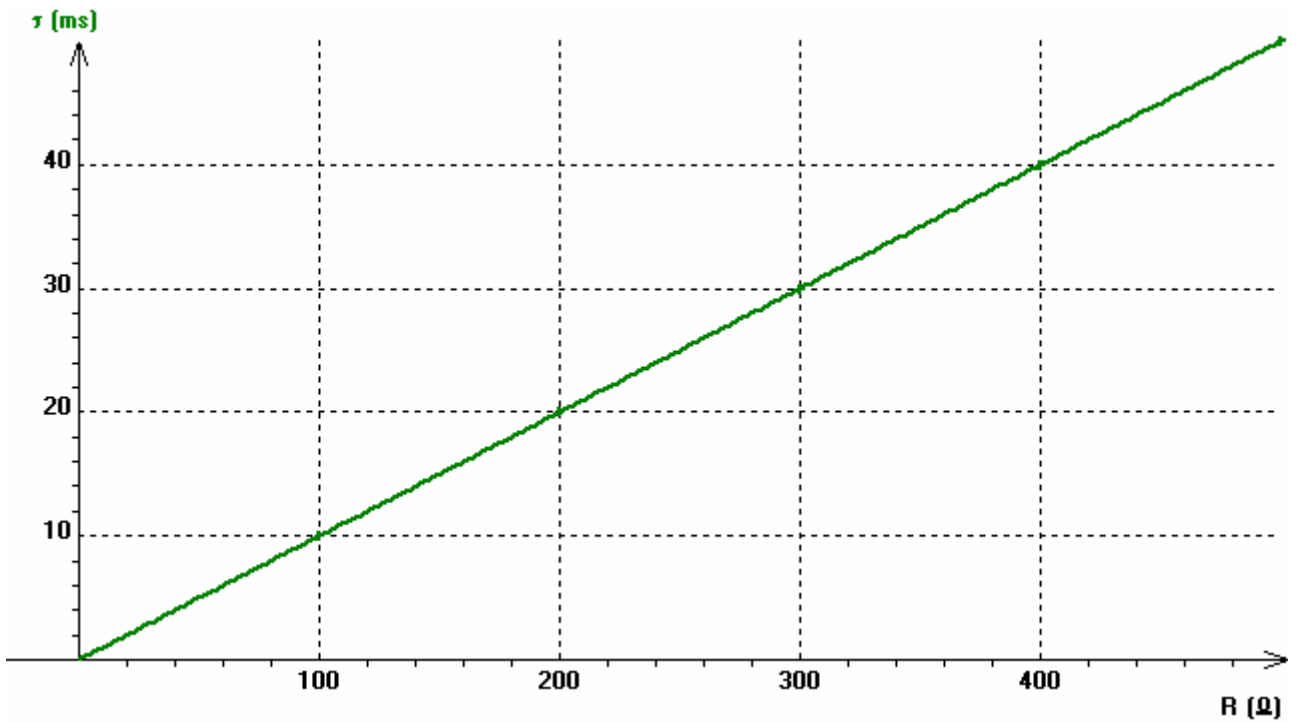
0.25..... $\tau = R \cdot C$ - 6

- 7

0.25..... :

R (Ω)	100	200	300	400	500
τ (ms)	10	20	30	40	50

0.5..... :



..... : / ⇒

0.25..... $C = \frac{(40 - 0) \times 10^{-3}}{(400 - 0)} = 100 \mu\text{F}$

..... $t = \tau$ /

0.25..... $E(C) = \frac{1}{2} C u_{BD}^2$:

0.25..... $u_{BD} = 0,63 \times 6 = 3,78\text{V}$: $t = \tau$

0.25..... $E(C) = \frac{1}{2} \times 100 \cdot 10^{-6} \times 3,78^3 = 7,1 \cdot 10^{-4}\text{J}$:

(4) :

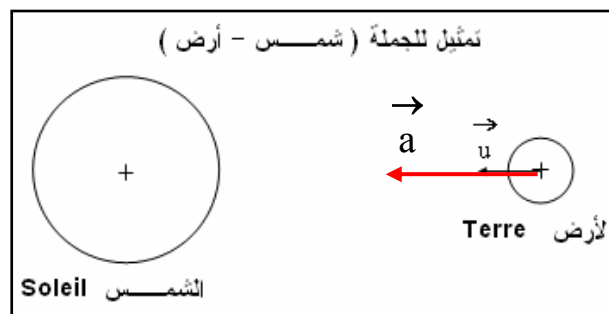
0.5..... $\vec{F}_{S/T} = G \cdot \frac{M_S \cdot M_T}{r^2} \cdot \vec{u}$: - 1

0.5..... $\sum \vec{F} = m \cdot \vec{a}$: II . - 2

0.25..... $\vec{F}_{S/T} = m \cdot \vec{a}$
 $\vec{F}_{S/T} = G \cdot \frac{M_S \cdot M_T}{r^2} \cdot \vec{u}$ $\vec{F}_{S/T} = m \cdot \vec{a}$ - 3

0.5..... $\vec{a} = G \cdot \frac{M_S}{r^2} \cdot \vec{u}$:

0.25..... :



0.25..... $a = \frac{v^2}{r}$: - 4

0.25..... $a = \frac{v^2}{r}$ $a = G \cdot \frac{M_S}{r^2}$ - 5

0.25..... $v = \sqrt{\frac{GM_S}{r}}$:

$$v = \sqrt{\frac{6,67 \cdot 10^{-11} \times 1,98 \cdot 10^{30}}{1,5 \cdot 10^{11}}}$$

0.25..... $v = 2,97 \cdot 10^4 \text{ m/s} \approx 30 \text{ Km/s}$:

0.25..... $T = \frac{2\pi}{\omega} = \frac{2\pi \cdot r}{v}$ - 6

: - 7

0.5..... $T = \frac{2 \cdot \pi \cdot r^{\frac{3}{2}}}{\sqrt{G \cdot M_S}}$: $T = \frac{2\pi}{\omega} = \frac{2\pi \cdot r}{\sqrt{\frac{GM_S}{r}}}$

0.25..... $T = 363,4 \text{ J}$: : T

(4) :

:

- 1

0.25..... $T = 2\pi\sqrt{LC}$

:

0.25..... $T = 1,4 \text{ ms}$

:

0.25..... $f_0 = \frac{1}{T} = 714,3 \text{ Hz}$

- 2

0.25..

RLC

f_0

f

/

:

/

0.25..... $z = R$

:

0.5..... $z = 10 \Omega$

:

/ \Rightarrow

0.5..... $U_0 = z \cdot I_0$

:

0.25..... $U_0 = 0,73 \text{ V}$

$\Delta t = 0 \text{ s}$

/

0.5..... $Q = \frac{(U_C)_0}{U_0} = \frac{f_0}{\Delta f}$

:

0.5..... $\Delta f = \frac{U_0}{(U_C)_0} f_0$

:

0.5..... $\Delta f = 34,8 \text{ Hz}$