FORMULAIRE DE PHYSIQUE - 6ème sciences générales:

Rappels de mécanique:

$\boldsymbol{v} = \Delta \boldsymbol{x} / \Delta t$ $\quad \boldsymbol{a} = \Delta \boldsymbol{v} / \Delta t$ $\quad \mathbf{F} = m \,.\, \boldsymbol{a}$ $\quad \mathbf{F}_{A \text{ sur } B} = - \mathbf{F}_{B \text{ sur } A}$

$W = \Delta E$ $\quad W = F_{parallèle} \,.\, \Delta x$ $\quad Puiss = W / \Delta t$

$E_{cin} = m\, v^2 / 2$ $\quad E_{pot} = m \,.\, g \,.\, h$ $\quad E_{méca} = E_{cin} + E_{pot} =$ constante (*si pas de dissipation*)

Rappels d'électromagnétisme:

$I = Q / \Delta t$ $\quad Q = \pm n \,.\, e$ $\quad e = 1{,}60\ 10^{-19}$ (C)

$P = U \,.\, I$ $\quad W = Q \,.\, U$

$U = R \,.I$ $\quad C = Q / U$

$F_{el} = q\, E$ $\quad F_{Laplace} = B \,.\, I \,.\, L \sin \alpha$ $\quad F_{Lorentz} = q \,.\, v \,.\, B \sin \alpha$

$\Phi = B \,.\, S \,.\, \cos \alpha$ $\quad U_{induit} = - n_{sp} \,.\, \Delta\Phi / \Delta t = - L\, \Delta I / \Delta t$

$C_{plaques\ paral} = (\varepsilon_r \,.\, \varepsilon_0).\ S / d$ $\quad E_{el} = Q^2 / 2\, C$ $\quad \varepsilon_0 = 8{,}85\ 10^{-12}$ (F/m)

$L_{solenoïde} = (\mu_r\, \mu_0) \,.\, n_{sp}^{\,2} \,.\, S / l$ $\quad E_{mag} = L\, I^2 / 2$ $\quad \mu_0 = 4 \,.\, \pi \,.\, 10^{-7}$ (T m /A)

$R_{fil} = \rho \,.\, L / S$ $\quad P_{th} = R \,.\, I^2$ $\quad W_{th} = R \,.\, I^2 .\, \Delta t$

Ondes:

$T = 1 / f$ $\quad \omega = 2\, \pi f$

$y(t) = A \sin (\omega\, t + \varphi)$ $\quad v(t) = y'(t)$ $\quad a(t) = v'(t)$

$F = - k \,.\, \Delta y$ $\quad T_{ressort} = 2\, \pi \sqrt{(m / k)}$ $\quad T_{pendule} = 2\, \pi \sqrt{(l / g)}$

$E_{cin} = m\, v^2 / 2$ $\quad E_{pot} = k\, y^2 / 2$ $\quad E_{tot} = m\, \omega^2\, A^2 / 2 = k\, A^2 / 2$

$\lambda = v \,.\, T = v / f$ $\quad y_P(t) = A \sin (\omega\, t - 2\, \pi\, d / \lambda)$ $\quad v = \sqrt{F / \mu}$

$y_P(t) = 2\, A \sin (2\, \pi\, x / \lambda) \cos (\omega\, t - 2\, \pi\, L / \lambda)$ $\quad f_k = k \,.v / 2\, L$ ou $(2k + 1) \,.\, v / 4\, L$

$y_P(t) = 2\, A \cos (\pi\, (d_2 - d_1) / \lambda) \sin (\omega\, t - \pi\, (d_1 + d_2) / \lambda)$

$\beta = 10 \log_{10} (I / I_0)$ $\quad f_b = |f_1 - f_2|$

$f' = f \,.\, (v \pm v_{obs}) / (v \pm v_{source})$ $\quad \sin \theta = v / v_{source}$

$v = c / n$ $\quad \sin i / \sin R = v_1 / v_2 = n_{1 \text{ vers } 2} = n_2 / n_1$ $\quad i = r$

$c = 299\ 792\ 458$ m/s $\quad tg\ i_B = n$ $\quad v = H \,.\, D$

$i = \lambda \,.\, D / a$ $\quad \sin \theta_k = k\, \lambda / L$ $\quad \sin \theta_k = k\, \lambda / a$ $\quad x_k = D\ tg\ \theta_k$

$c = 1 / \sqrt{\varepsilon_0 \mu_0}$ $\quad E_{el} = \varepsilon_0\, E^2 / 2$ $\quad E_{mag} = B^2 / (2\, \mu_0)$ $\quad S_{moy} = c\, \varepsilon_0\, E_{moy}^{\,2}$

$h = 6{,}63\ 10^{-34}$ (J.s) $\quad E = h \,.\, f$ $\quad h \,.\, f = W_0 + E_{cin}$ $\quad p = m\, v = h\ / \lambda$

$E = m_v\, c^2 = m_0\, c^2 / \sqrt{(1 - v^2 / c^2)}$

$m_{proton} = 1{,}0073$ uma $\quad m_{neutron} = 1{,}0087$ uma $\quad m_{éléctron} = 0{,}0005$ uma

1 uma = $1{,}6606\ 10^{-27}$ kg

$A = \lambda \,.\, N$ $\quad N(t) = N_0 \,.\, e^{-\lambda . t}$ $\quad T_{1/2} = \ln 2 / \lambda$