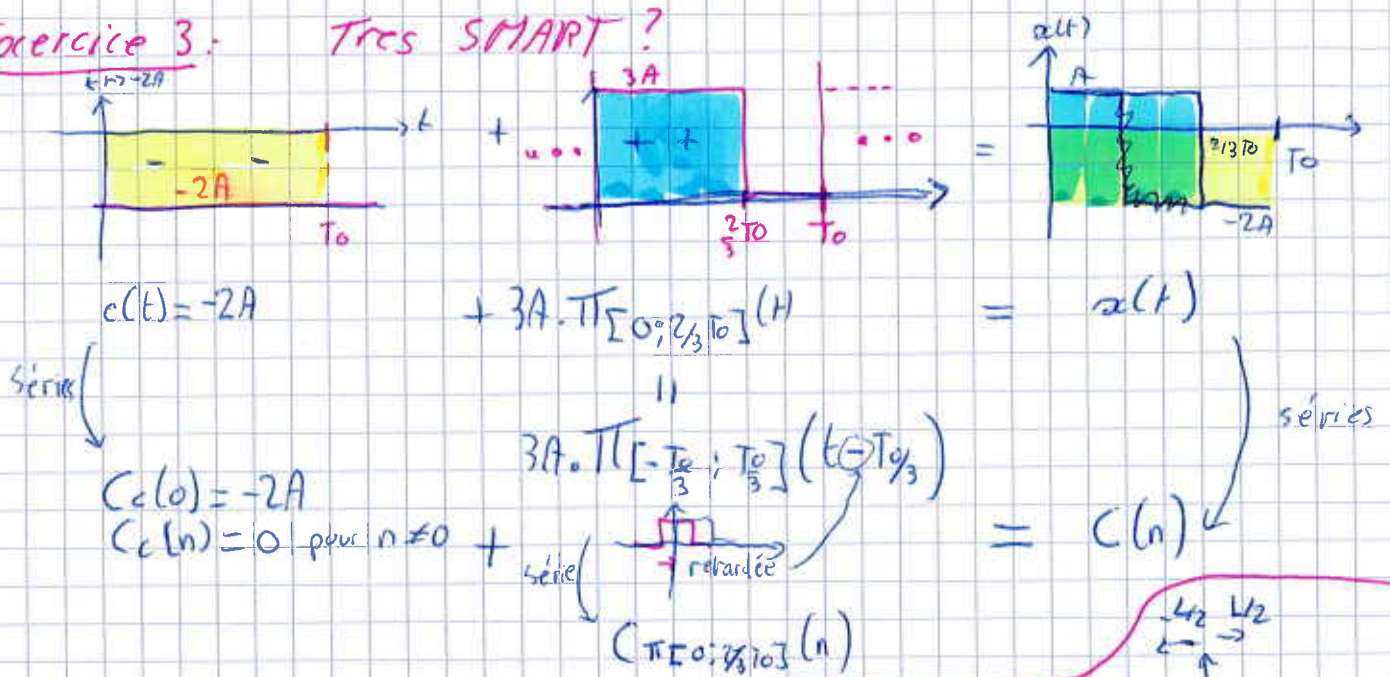


Exercice 3: Très SMART?

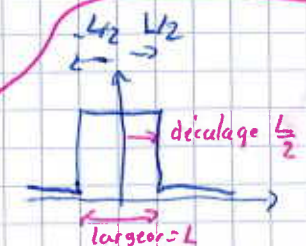


A savoir!

$$\Pi[-\frac{L}{2}; \frac{L}{2}](n) = \frac{L}{T_0} \text{sinc}\left(\frac{L n \omega_0}{2}\right)$$

$\xrightarrow{\text{largeur}}$ $\xrightarrow{\text{décalage}}$

d'où $\Pi[-\frac{T_0}{3}; \frac{T_0}{3}](n) = \frac{2T_0}{3} \cdot \frac{1}{T_0} \text{sinc}\left(\frac{T_0 \omega_0}{3} n\right)$



$\text{sinc}: x \rightarrow \frac{\sin(x)}{x}$
 $\text{et } \text{sinc}(0) = 1$

$$= \frac{2}{3} \text{sinc}\left(n \frac{2\pi}{3}\right)$$

Avec le retard $(\times e^{-in\omega_0 T_0/3})$

$$\Pi[0; 2/3 T_0](n) = \frac{2}{3} \text{sinc}\left(n \frac{2\pi}{3}\right) \cdot e^{-in\omega_0 T_0/3}$$

$$= \frac{2}{3} \frac{\sin(n \frac{2\pi}{3})}{n \frac{2\pi}{3}} \cdot e^{-in\omega_0 T_0/3}$$

$$= \frac{1}{n\pi} \left(1 - e^{-in\frac{4\pi}{3}}\right)$$

d'où $c(0) = c(0) + 3A \Pi[0; 2/3 T_0](0) = -2A + 3A \left(\frac{2}{3} \text{sinc}(0) \cdot e^{-i0}\right)$

$$c(0) = 0$$

$n \neq 0$, $c(n) = c(n) + 3A \frac{2}{3} \text{sinc}\left(n \frac{2\pi}{3}\right) e^{-in\frac{2\pi}{3}}$

$$c(n) = \frac{3A}{n\pi} \left(1 - e^{-in\frac{4\pi}{3}}\right) = \frac{3A}{n\pi} (1 - \cos n\frac{4\pi}{3}) - i \frac{3A}{n\pi} \sin(n\frac{4\pi}{3})$$

$c(n) = \frac{a(n)}{2} - i \frac{b(n)}{2}$