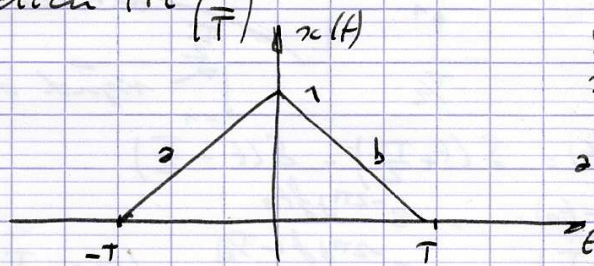


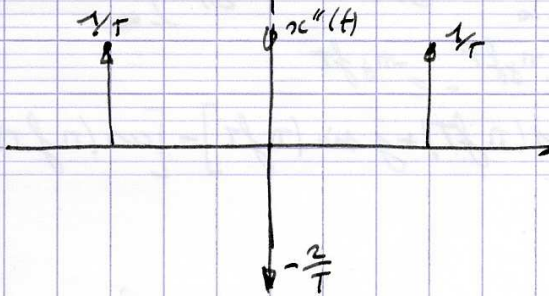
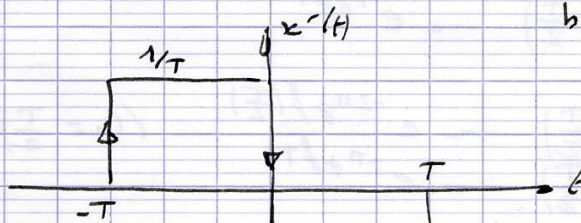
cas 3: Fonction Tri $\left(\frac{t}{T}\right)$



$$\frac{y_T - y_0}{x_T - x_0} = \text{pente } a$$

$$a = \frac{1 - 0}{0 - (-T)} = \frac{1}{T}$$

$$b = \frac{0 - 1}{T - 0} = -\frac{1}{T}$$



$$x''(t) = \frac{1}{T} \delta(t+T) - \frac{2}{T} \delta(t) + \frac{1}{T} \delta(t-T)$$

$$G(f) = \text{TF}(x''(t))$$

$$\delta(t-t_0) \xrightarrow{\text{TF}} e^{-2\pi j f t_0}$$

$$\begin{aligned} G(f) &= \frac{1}{T} e^{2\pi j f T} - \frac{2}{T} + \frac{1}{T} e^{-2\pi j f T} \\ &= \frac{1}{T} (e^{2\pi j f T} + e^{-2\pi j f T}) - \frac{2}{T} \\ &= \frac{1}{T} (2 \cos(2\pi f T)) - \frac{2}{T} \\ &= \frac{2}{T} (\cos 2\pi f T - 1) \end{aligned}$$

$$\begin{aligned} X(f) &= \frac{\text{TF}(x''(t))}{(2\pi j f)^2} = \frac{2(\cos(2\pi f T) - 1)}{-4\pi^2 f^2 T} \\ &= \frac{\cos(2\pi f T) - 1}{-2\pi^2 f^2 T} \end{aligned}$$

$$\cos(2\alpha) = 2\cos^2\alpha - 1 = 1 - 2\sin^2\alpha$$

$$\cos(2\alpha) - 1 = -2\sin^2\alpha$$

$$\begin{aligned} X(f) &= \frac{-2\sin^2(\pi f T)}{-2\pi^2 f^2 T} \\ &= \frac{-T 2\sin^2(\pi f T)}{-2\pi^2 f^2 T^2} \end{aligned}$$

$$\text{Sinc}(\pi f T) = \frac{\sin(\pi f T)}{\pi f T}$$

$$X(f) = T \text{sinc}^2(\pi f T)$$

