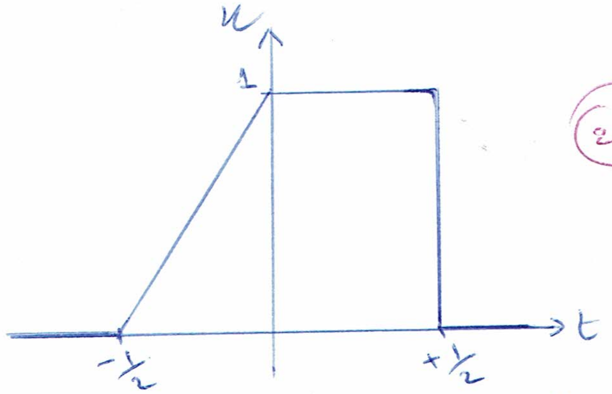
# Corrigé type
## Interrogation TS

1°/

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2°/ **Densité spectrale pour $f=0$ :**

$$X(0) = \int_{-\frac{1}{2}}^{0} (2t+1)\, dt + \int_{0}^{\frac{1}{2}} 1 . dt = \left[\cancel{2}\frac{t^2}{\cancel{2}} + t\right]_{-\frac{1}{2}}^{0} + \left[t\right]_{0}^{\frac{1}{2}} = 0 - \frac{1}{4} + \frac{1}{2} + \frac{1}{2} = \frac{3}{4}$$

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3°/ **Transformée de Fourier :**

$$X(f) = \int_{-\infty}^{+\infty} x(t) . e^{-j2\pi f t}\, dt$$

$$= \underbrace{\int_{-\frac{1}{2}}^{0} (2t+1) e^{-j2\pi f t}\, dt}_{A} + \underbrace{\int_{0}^{\frac{1}{2}} e^{-j2\pi f t}\, dt}_{B}$$

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$$A = (2t+1) \left.\frac{e^{-j2\pi f t}}{-j2\pi f}\right|_{-\frac{1}{2}}^{0} - 2 \left.\frac{e^{-j2\pi f t}}{(-j2\pi f)^2}\right|_{-\frac{1}{2}}^{0}$$

1

$$= -\frac{1}{j2\pi f} - 2\frac{(1 - e^{j\pi f})}{(j2\pi f)^2}$$

1

$$B = \frac{1 - e^{-j\pi f}}{j2\pi f}$$

1

$$\Rightarrow X(f) = -\frac{1}{j2\pi f} + \frac{2e^{j\pi f} - 2}{(j2\pi f)^2} + \frac{1 - e^{-j\pi f}}{j2\pi f} = 2 . \frac{e^{j\pi f} - 1}{(j2\pi f)^2} - \frac{e^{-j\pi f}}{j2\pi f}$$

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