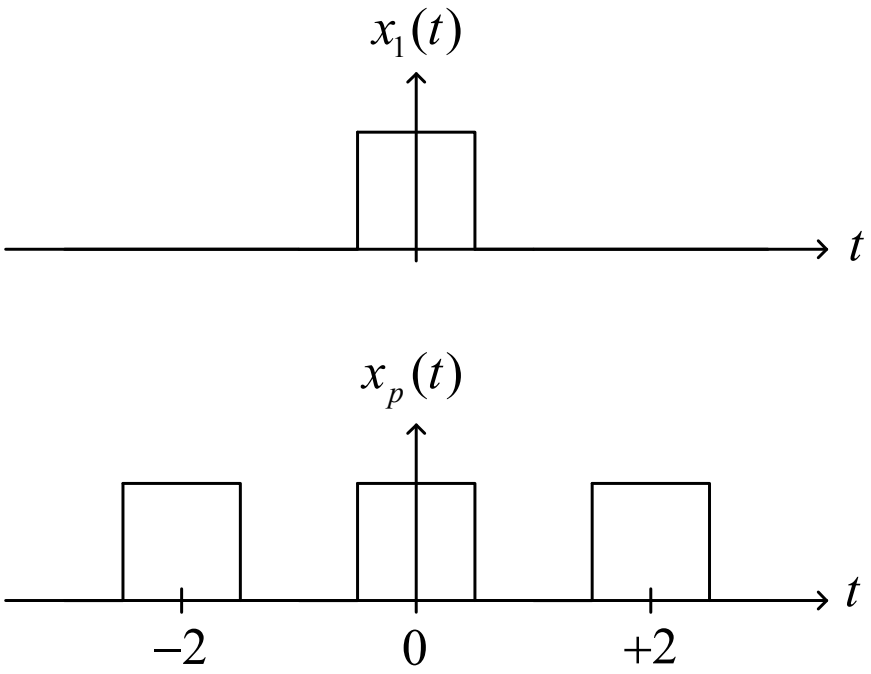
Homework #04

Problem 1



(1) $x_1(t) = rect(t)$

Explain that $x_p(t) = x_1(t) * \sum_{n=-\infty}^{+\infty} \delta(t - n \times 2)$.

(2) Find and plot $X_1(f)$ **(CTFT of** $x_1(t)$ **)** .

(3) Find and plot $X_p[k]$ **(CTFS of** $x_p(t)$ **)** .

(4) Compare the results of (1) and (2).

(5) Find and plot $X_p(f)$ **(CTFT of** $x_p(t)$ **)** .

(6) Compare the results of (3) and (4).

Problem 2 Delta Function

Prove the following equations which are related to Delta Function.

$$(1)\ x(t)\times\delta(t)=x(0)\times\delta(t)$$

$$(2)\ x(t)\times\delta(t-a)=x(a)\times\delta(t-a)$$

$$(3)\ x(t)*\delta(t)=x(t)$$

$$(4)\ x(t)*\delta(t-a)=x(t-a)$$

Problem 3

$$x(t)=\sum_{n=-\infty}^{+\infty}\delta(t-n\times T)$$

(1) Find and plot $X[k]$ **(CTFS of $x(t)$)** .

(2) Find and plot $X(f)$ **(CTFT of $x(t)$)** .