Homework #01

Problem 1

1. Describe CTFT.
2. Describe CTFS.

Problem 2

$x_1(t)$ is finite-length signal and it is defined in $0 < t < T$.

$x_p(t)$ is a periodic signal and $x_p(t + nT) = x_p(t)$.

$$x_p(t) = x_1(t) * \sum_{l=-\infty}^{+\infty} \delta(t - l \times T)$$

Find the relationship between $X_1(f)$ and $X_p[k]$.

Problem 3

$$x_1(t) = e^{-at}[u(t) - u(t - T)]$$

$$x_p(t) = x_1(t) * \sum_{l=-\infty}^{+\infty} \delta(t - l \times T)$$

1. Calculate $X(f)$ and $X_p(f)$.
2. For a=0.1 and T=10
   a. Plot $x_1(t)$
   b. Plot $x_p(t)$
   c. Plot $X_1(f)$
   d. Plot $X_p(f)$
   e. Plot $\left|X_1(f)\right|$ and $\left|X_p[k]\right|$ (All plots are in Matlab)