Homework #03

Problem 1

1. Describe DTFT.
2. Describe DTFS.

Problem 2

$x_1[n]$ is finite-length signal and it is defined in $0 < t < T$.

$x_p[p]$ is a periodic signal and $x_p[n] = \sum_{l=-\infty}^{+\infty} x_1[n - lN]$

$$x_p[n] = x_1[n] * \sum_{l=-\infty}^{+\infty} \delta[n - l \times N]$$

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

Problem 3

$$x_1[n] = e^{-an}[u(n) - u(n-N)]$$

$$x_p[n] = x_1[n] * \sum_{l=-\infty}^{+\infty} \delta[n - l \times N]$$

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