Homework 1: due 01/19/18

EE 324: Signals and Systems II

1 Continuous time Fourier transform (FT)

1. $x(t) = e^{-t}\sin(\pi t)u(t)$
2. $x(t) = \begin{cases} 1 & 0 \le t \le 1 \\ 2 & 1 \le t \le 2 \\ 0 & \text{otherwise} \end{cases}$

2 Discrete time Fourier transform (DTFT)

1. $x[n] = u(n) - u(n-5) + \delta(n-8)$
2. $x[n] = 3^n \cos(\frac{2\pi}{3}n)u(-n+3)$

3 Fourier series (FS)

1. $x(t) = 1 + \cos(2\pi t) + \sin(4\pi t), \quad T = 1$
2. $x(t) = \begin{cases} t & 0 \le t \le 1 \\ 2-t & 1 \le t \le 2 \end{cases}, \quad T = 2.$

4 Discrete Fourier transform (DFT, DTFS)

1. $x[n] = (-1)^n \sin(\frac{\pi}{3}n), \quad 0 \le n \le 5$
2. $x[n] = \begin{cases} 1 & 0 \le n \le 3 \\ 0 & 4 \le n \le 7 \end{cases}$