EECS202000 Signals and Systems
Homework #4

(Due November 29, 2021 before noon. Please submit in PDF format to the course website.)

Note: Detailed derivations are required to obtain a full score for each problem. (Total 100%)

1. (8%+4%+6%) Problem 4.8 of the textbook for

$$x(t) = \begin{cases} -1, & t < -1, \\ \frac{3}{2}t + \frac{1}{2}, & -1 \le t \le 1, \\ 2, & t > 1. \end{cases}$$

Additionally, for (c), find the Fourier transform of the even and odd parts of $x(t)$.

2. (5%+5%+5%+5%) Problem 4.21 (e), (f), (g) and (h) of the textbook.

3. (6%+6%) Problem 4.26 of the textbook.

4. (6%+6%+6%) Problem 4.33 of the textbook.

5. (5%+5%) Problem 4.44 of the textbook.

6. (6%+6%+6%) Problem 5.4 of the textbook and an additional (c) where $X(e^{j\omega}) = \frac{1}{1-e^{-j\omega}} \frac{\sin \frac{5}{2}\omega}{\sin \frac{\omega}{2}} + 9\pi\delta(\omega)$, for $-\pi < \omega \le \pi$.

7. (4%) Problem 5.18 of the textbook.