EE160 - Fall 2023 **San José State University**

Solution of Homework # 2

1. Harmonic power ratios

   (a) A periodic train of rectangular pulses of amplitudes $\{0, 1\}$ and duty cycle $d = 1/5$:

n	R_n (dB)
2	-1.8408
3	-5.3627
4	-12.0412
5	$-\infty$

   (b) Square waveform:

n	R_n (dB)
2	$-\infty$
3	-9.5424
4	$-\infty$
5	-13.9794

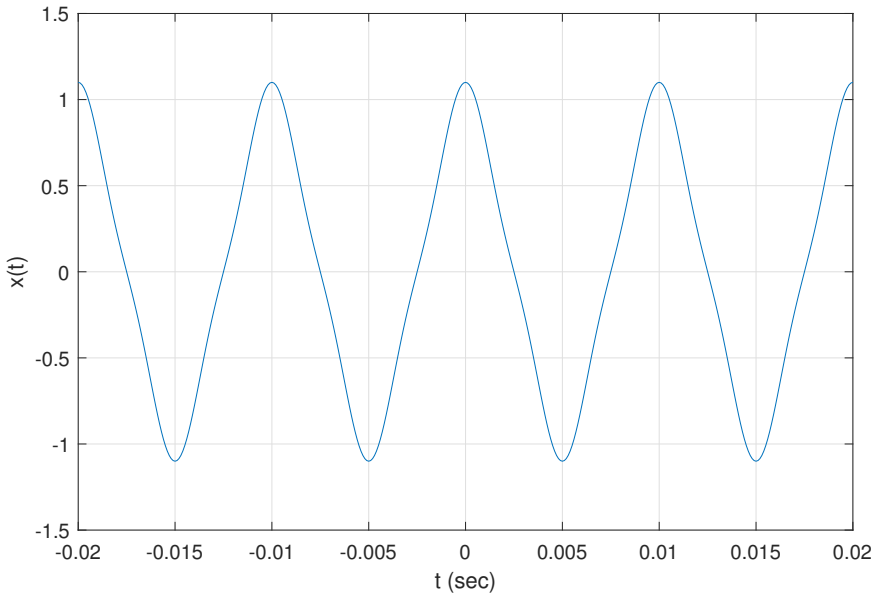
   (c) Triangular waveform::

n	R_n (dB)
2	$-\infty$
3	-19.0849
4	$-\infty$
5	-27.9588

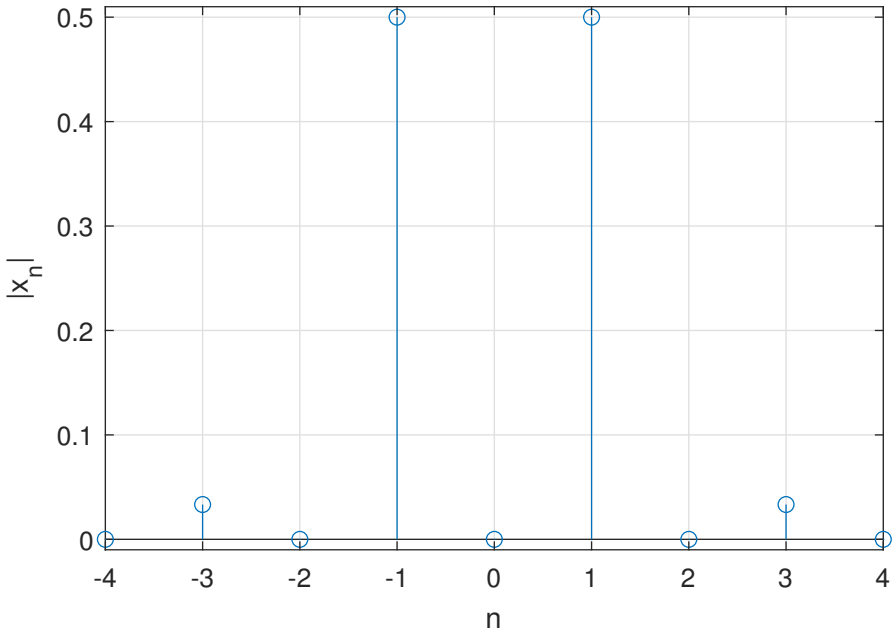
2. The discrete amplitude spectra are shown in the last page.

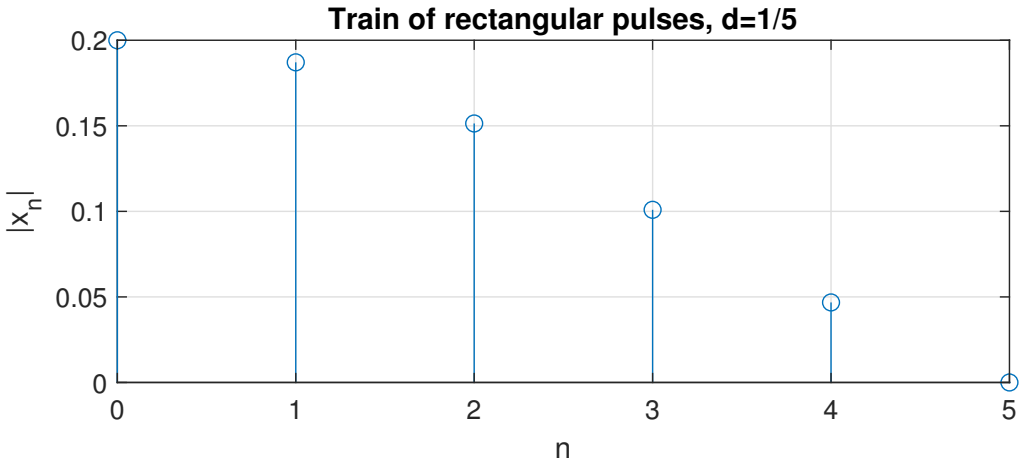
3. (a) $f_0 = 100$ Hz, $T_0 = 1/f_0 = 10$ ms.

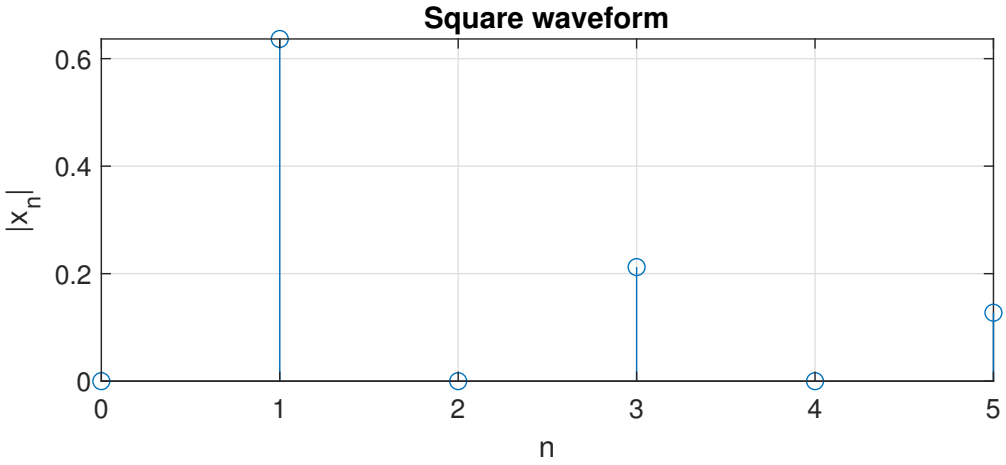
   (b) Plot:

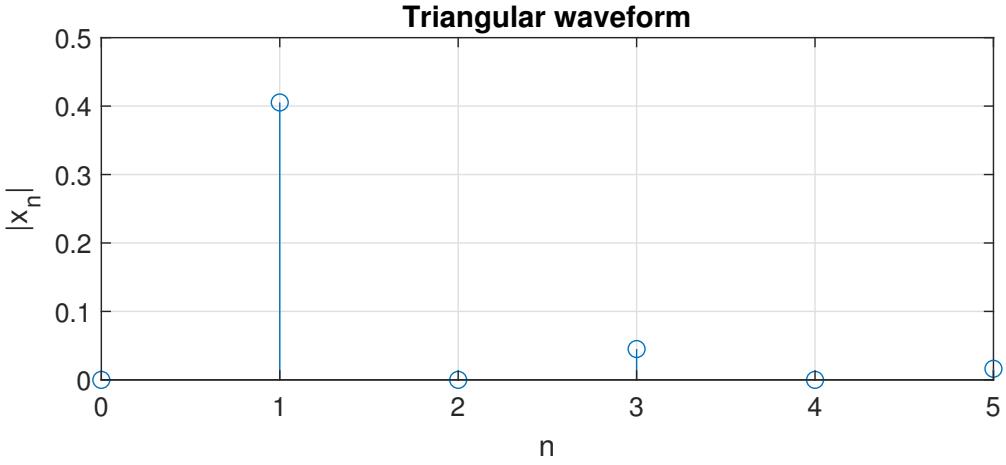


(c) Discrete amplitude spectrum:




Train of rectangular pulses, d=1/5
0.2
0.15
0.1
0.05
0
|x_n|
0
1
2
3
4
5
n


Square waveform
0.6
0.4
0.2
0
|x_n|
0
1
2
3
4
5
n


Triangular waveform
0.5
0.4
0.3
0.2
0.1
0
|x_n|
0
1
2
3
4
5
n