

Homework 4
EE 313 Signals and Systems (Fall 2024)
Friday, October 4, 2024

- 1) 3.3f
- 2) For the signal of 3.3f, use MATLAB to plot the exact $x(t)$ (dashed line) as well as compute & plot the Fourier series $x_N(t)$ for $N = 5$ (solid line) over the time range $-1.5 \leq t \leq 1.5$ s.
- 3) 3.4f
- 4) For 3.3f/3.4f, compute the exact overall time-average ‘power’ in $x(t)$ as well as the ‘power’ contained in the dc as well as each of the first three harmonics of the Fourier series $x_N(t)$. Then, find the total power in the DC + first 3 harmonics. Express answers both as a number and as a percentage of the total ‘power’. Tabulate results (see below).

Term(s)	‘power’	% of total ‘power’
Exact		
DC		
First harmonic		
Second harmonic		
Third harmonic		
DC + first 3 harmonics		

- 5) 3.10f Parts (i) & (ii)
- 6) 3.11ac

Extra Credit: Do part (iii) of 3.10f. Plot the exact $x(t)$ (dashed line) as well as compute & plot the truncated Fourier series $x_N(t)$ (solid line) over the time range $-1.5 \leq t \leq 1.5$ s.

For problems that involve the use of MATLAB, include both m-file(s) (put your name in a comment line) as well as output figures (put your name in title), preferably on same page (e.g., cut-n-paste into MS-Word before printing), for each problem and/or problem section.

Due Thursday, October 10, 2024 by 4 pm at my office or EEP mail box.