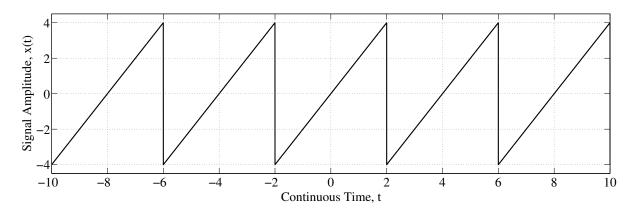
ELEC 309

Signals and Systems Homework 5 Assignment

Frequency-Domain Analysis of Signals



- 1. For the periodic continuous-time signal x(t) shown above:
 - (a) Find the exponential Fourier series representation of x(t).
 - (b) Find the trigonometric Fourier series representation of x(t).
 - (c) Find the harmonic/compact Fourier series representation of x(t).
 - (d) Verify Parseval's theorem for x(t), using the identity

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}.$$

(e) Using MATLAB, write a script m-file to plot the Fourier spectra for the signal. (Plot $|D_n|$ vs. ω and $\angle D_n$ vs. ω (where $\omega = n\omega_0$) on a single figure by using the *subplot* command.) Upload a copy of your MATLAB script m-file to the course website.