ECE 3337: Signals & Systems Analysis, Class Worksheet 20
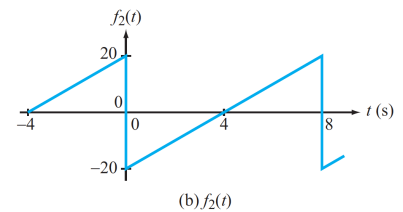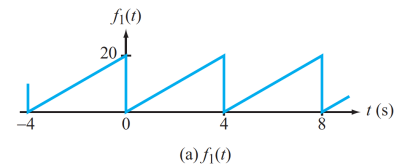
1. The Fourier series of a periodic waveform is

$$f_1(t) = 10 - \frac{20}{\pi} \sum_{n=1}^{\infty} \left(\frac{1}{n} \sin\left(\frac{n\pi t}{2} \right) \right)$$

(a) (20 pts) Determine the Fourier series of waveform $f_2(t)$.

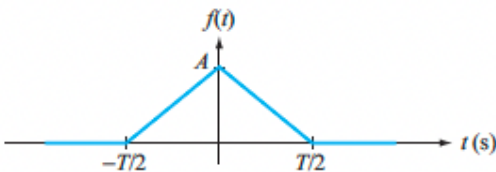(b) (10 pts) Determine the total average power of $f_2(t)$.

(Hint: $\sum_{n=1}^{\infty} \left(\frac{1}{n^2} \right) = \left(\frac{\pi^2}{6} \right)$)

(c) (10 pts) Determine the fractional power of the second harmonic with respect to the total average power.

2. Determine the Fourier transform of the following waveforms:
(a) (30 pts) Assume A = 10 and T = 6s

(b) (30 pts) Assume A = 1 and T = 2s