

EECS 360  
Homework #8

1. Section 4.5 Participation Activities
  - 4.5.1: Fourier series analysis for RC circuit with triangle wave input.
  - 4.5.3: Fourier analysis of RC circuit, half-wave rectified sine input.
2. Section 4.6 Participation Activities
  - 4.6.1: Average power of sinusoidal signals.
  - 4.6.2: Average power of sum and product of sinusoids.
  - 4.6.3: Parseval's theorem for Fourier series.
3. For  $x(t) = 8\cos(300\pi t) - 3\sin(600\pi t)$  find  $P_x$  using the Parseval's theorem using the following Fourier series representations
  - a. sinc/cosine Fourier series representation of  $x(t)$ ,  $a_0$ ,  $a_n$  and  $b_n$
  - b. amplitude/phase Fourier series representation of  $x(t)$ ,  $c_0$ ,  $c_n$ ,  $\phi_n$
  - c. complex exponential Fourier series representation of  $x(t)$ ,  $x_n$
4. Section 4.6 Challenge Activity
  - 4.6.1: Parseval's theorem for periodic waveforms.
5. Exercise 4.6.2
6. Exercise 4.6.3
7. Section 4.7 Participation Activities
  - 4.7.1: Fourier transform and sinc
  - 4.7.2: Rectangular pulse frequency spectrum.
  - 4.7.3: Calculating Fourier transforms of constants and exponentials.
8. Let  $x(t) = \frac{5}{3}t * \text{rect}(\frac{t-1.5}{3})$ . Plot  $x(t)$  and find the Fourier Transform of  $x(t)$ .
9. Find the Fourier Transform of  $10\text{tri}(\frac{t}{6})$
10. Exercise 4.7.3
11. Exercise 4.7.6