A periodic signal, \( x(t) \), is shown below, with period \( T = \frac{1}{60} \) sec.

1. Determine the fundamental frequency and find the sine/cosine Fourier series and magnitude/phase Fourier series.

2. Sketch the magnitude and phase spectra.

3. Determine the power in the signal.

4. Determine the percentage power in i) the first harmonic; ii) the fifth harmonic.

5. Determine the number of terms necessary for a truncated Fourier series to have no more than i) 5% normalized MSE; 2% normalized MSE.

First, how would the Fourier series differ for the signals below? Explain.
A two-second speech sentence and extracted 20 ms segment. Sampling rate is 8,000 Hz.

Magnitude Spectrum of 20 ms speech segment. Main components at 250, 500, 750, and 1000 Hz.