



The following two figures show the “Fourier construction” of a periodic, bipolar, unit-amplitude triangle wave. The waveforms in these figures were generated using truncated, finite-term version(s) of the Fourier series expansion for this waveform:

$$f(\theta) \Big|_{\substack{\text{triangle} \\ \text{-wave}}} = 2 \sum_{m=1}^{m=\infty} (-1)^{m-1} \left(\frac{2}{(2m-1)\pi} \right)^2 \sin[(2m-1)\theta] = \frac{8}{\pi^2} \left\{ \sin \theta - \frac{1}{9} \sin 3\theta + \frac{1}{25} \sin 5\theta - \frac{1}{49} \sin 7\theta + \dots \right\}$$

The first figure shows the bipolar triangle wave (labelled as “Waveform”) overlaid with three other waveforms: that associated with just the fundamental (“ $n = 1$ ”), then the waveform associated with fundamental + 3rd harmonic (“ $n = 1:3$ ”), then the waveform associated with fundamental + 3rd + 5th harmonic (“ $n = 1:5$ ”).

