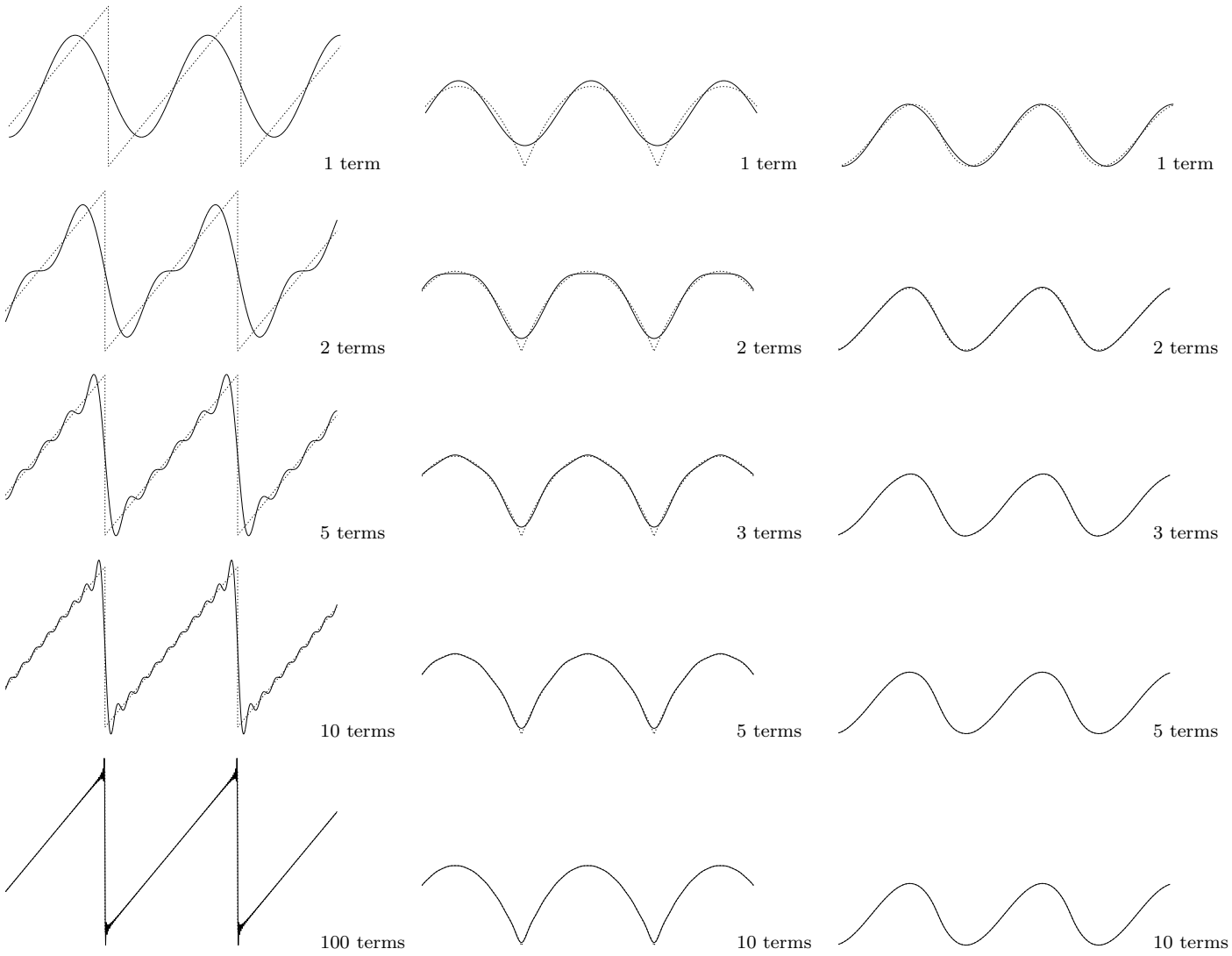
The aim of this document is to display the effect of the degree of continuity of the given periodic function on the speed of convergence of the Fourier Series.



Partial sums of the Fourier series for $f(t) = t$ in the range $-1 < t < 1$, where $f(t)$ is 2-periodic.
Partial sums of the Fourier series for $g(t) = 1 - t^2$ in the range $-1 < t < 1$, where $g(t)$ is 2-periodic.
Partial sums of the Fourier series for $g(t) = t - t^3$ in the range $-1 < t < 1$, where $h(t)$ is 2-periodic.

$$f(t) = \frac{2}{\pi} \sum_{n=1}^{\infty} \frac{(-1)^{n+1} \sin n\pi t}{n}.$$

$$g(t) = \frac{2}{3} + \frac{4}{\pi^2} \sum_{n=1}^{\infty} \frac{(-1)^{n+1} \cos n\pi t}{n^2}.$$

$$h(t) = \frac{12}{\pi^3} \sum_{n=1}^{\infty} \frac{(-1)^{n+1} \sin n\pi t}{n^3}.$$

D.A.S.R. 13/12/2012