

2. Let $f(\theta)$ be a continuous function on the interval $-\pi \leq \theta \leq \pi$, and let $f_N(\theta)$ denote its N^{th} Fourier series approximant. Show that

$$\lim_{N \rightarrow \infty} f_N(\pm\pi) = \frac{1}{2}[f(\pi) + f(-\pi)]$$

at the endpoints of the interval.