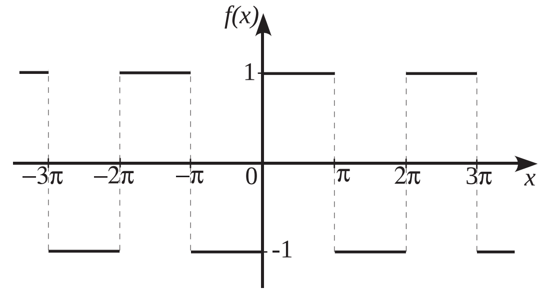
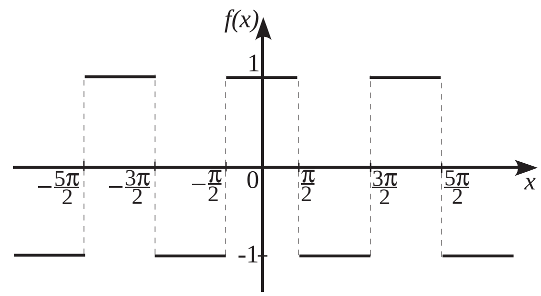
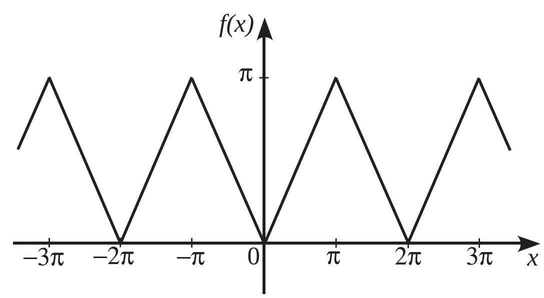
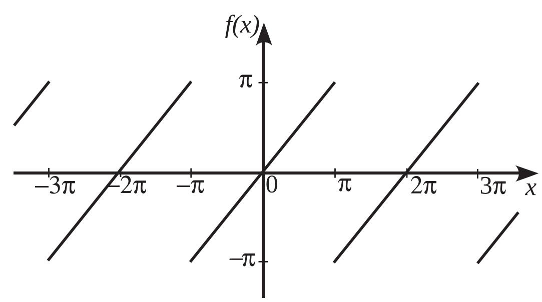
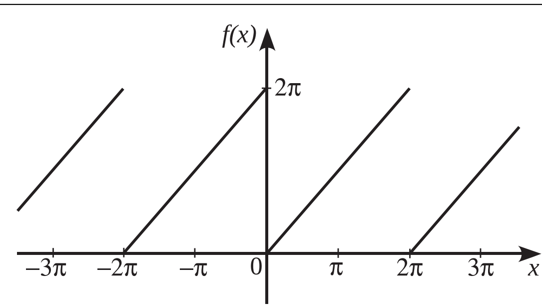
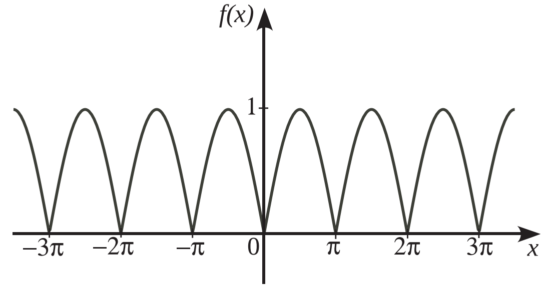
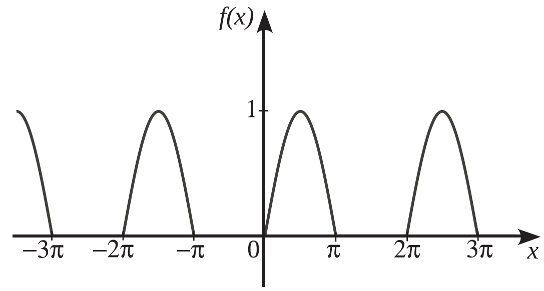
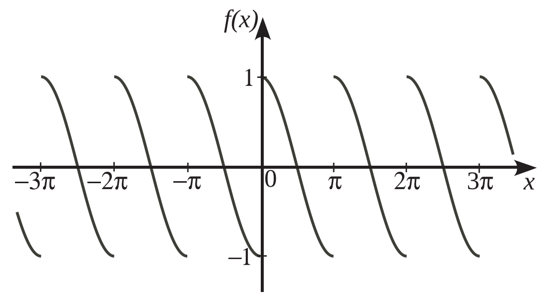
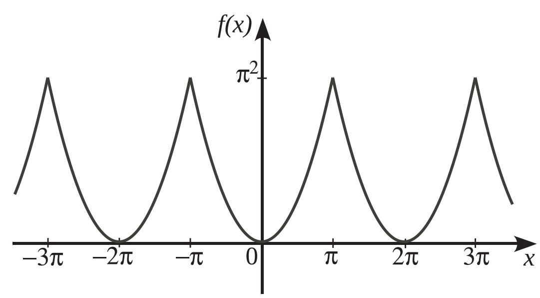
Table de séries de Fourier

Les séries de Fourier dans cette table convergent vers les fonctions périodiques données en tout point de continuité et vers la valeur moyenne en un point de discontinuité. En ce sens, l'égalité entre la fonction $f(x)$ et sa série de Fourier n'est valable qu'aux points de continuité.

T1	$f(x)=\begin{cases}-1 & -\pi<x<0\\ 1 & 0<x<\pi\end{cases}, \quad \text{avec } P=2\pi$ $f(x)=\frac{4}{\pi}\left(\frac{\sin(x)}{1}+\frac{\sin(3x)}{3}+\frac{\sin(5x)}{5}+\cdots\right)$ $f(x)=\frac{4}{\pi}\sum_{n=1}^{\infty}\frac{1}{2n-1}\sin\big((2n-1)x\big)$	
T2	$f(x)=\begin{cases}1 & -\frac{\pi}{2}<x<\frac{\pi}{2}\\ -1 & \frac{\pi}{2}<x<\frac{3\pi}{2}\end{cases} \quad \text{avec } P=2\pi$ $f(x)=\frac{4}{\pi}\left(\frac{\cos(x)}{1}-\frac{\cos(3x)}{3}+\frac{\cos(5x)}{5}-\cdots\right)$ $f(x)=\frac{4}{\pi}\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{2n-1}\cos\big((2n-1)x\big)$	
T3	$f(x)=\lvert x\rvert=\begin{cases}-x & -\pi<x<0\\ x & 0<x<\pi\end{cases} \quad \text{avec } P=2\pi$ $f(x)=\frac{\pi}{2}-\frac{4}{\pi}\left(\frac{\cos(x)}{1^2}+\frac{\cos(3x)}{3^2}+\frac{\cos(5x)}{5^2}+\cdots\right)$ $f(x)=\frac{\pi}{2}-\frac{4}{\pi}\sum_{n=1}^{\infty}\frac{1}{(2n-1)^2}\cos\big((2n-1)x\big)$	
T4	$f(x)=x, \quad -\pi<x<\pi, \quad \text{avec } P=2\pi$ $f(x)=2\left(\frac{\sin(x)}{1}-\frac{\sin(2x)}{2}+\frac{\sin(3x)}{3}-\cdots\right)$ $f(x)=2\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n}\sin(nx)$	
T5	$f(x)=x, \quad 0<x<2\pi, \quad \text{avec } P=2\pi$ $f(x)=\pi-2\left(\frac{\sin(x)}{1}+\frac{\sin(2x)}{2}+\frac{\sin(3x)}{3}+\cdots\right)$ $f(x)=\pi-2\sum_{n=1}^{\infty}\frac{1}{n}\sin(nx)$	

T6	$f(x)=\left\|\sin(x)\right\|, \quad 0<x<\pi, \quad \text{avec } P=\pi$ $f(x)=\frac{2}{\pi}-\frac{4}{\pi}\left(\frac{\cos(2x)}{1\cdot 3}+\frac{\cos(4x)}{3\cdot 5}+\frac{\cos(6x)}{5\cdot 7}+\cdots\right)$ $f(x)=\frac{2}{\pi}-\frac{4}{\pi}\sum_{n=1}^{\infty}\frac{\cos(2nx)}{(2n-1)\cdot(2n+1)}$	
T7	$f(x)=\begin{cases}\sin(x) & 0<x<\pi\\ 0 & \pi<x<2\pi\end{cases} \quad \text{avec } P=2\pi$ $f(x)=\frac{1}{\pi}+\frac{\sin(x)}{2}-\frac{2}{\pi}\left(\frac{\cos(2x)}{1\cdot 3}+\frac{\cos(4x)}{3\cdot 5}+\frac{\cos(6x)}{5\cdot 7}+\cdots\right)$ $f(x)=\frac{1}{\pi}+\frac{\sin(x)}{2}-\frac{2}{\pi}\sum_{n=1}^{\infty}\frac{\cos(2nx)}{(2n-1)\cdot(2n+1)}$	
T8	$f(x)=\cos(x), \quad 0<x<\pi, \quad \text{avec } P=\pi$ $f(x)=\frac{8}{\pi}\left(\frac{\sin(2x)}{1\cdot 3}+2\,\frac{\sin(4x)}{3\cdot 5}+3\,\frac{\sin(6x)}{5\cdot 7}+\cdots\right)$ $f(x)=\frac{8}{\pi}\sum_{n=1}^{\infty}\frac{n}{(2n-1)\cdot(2n+1)}\sin(2nx)$	
T9	$f(x)=x^2, \quad -\pi<x<\pi, \quad \text{avec } P=2\pi$ $f(x)=\frac{\pi^2}{3}-4\left(\frac{\cos(x)}{1^2}-\frac{\cos(2x)}{2^2}+\frac{\cos(3x)}{3^2}-\cdots\right)$ $f(x)=\frac{\pi^2}{3}-4\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{n^2}\cos(nx)$	
T10	$f(x)=x(\pi-x), \quad 0<x<\pi, \quad \text{avec } P=\pi$ $f(x)=\frac{\pi^2}{6}-\left(\frac{\cos(2x)}{1^2}+\frac{\cos(4x)}{2^2}+\frac{\cos(6x)}{3^2}+\cdots\right)$ $f(x)=\frac{\pi^2}{6}-\sum_{n=1}^{\infty}\frac{1}{n^2}\cos(2nx)$