Jun 12, 2018

CK0030: Partial evaluation III

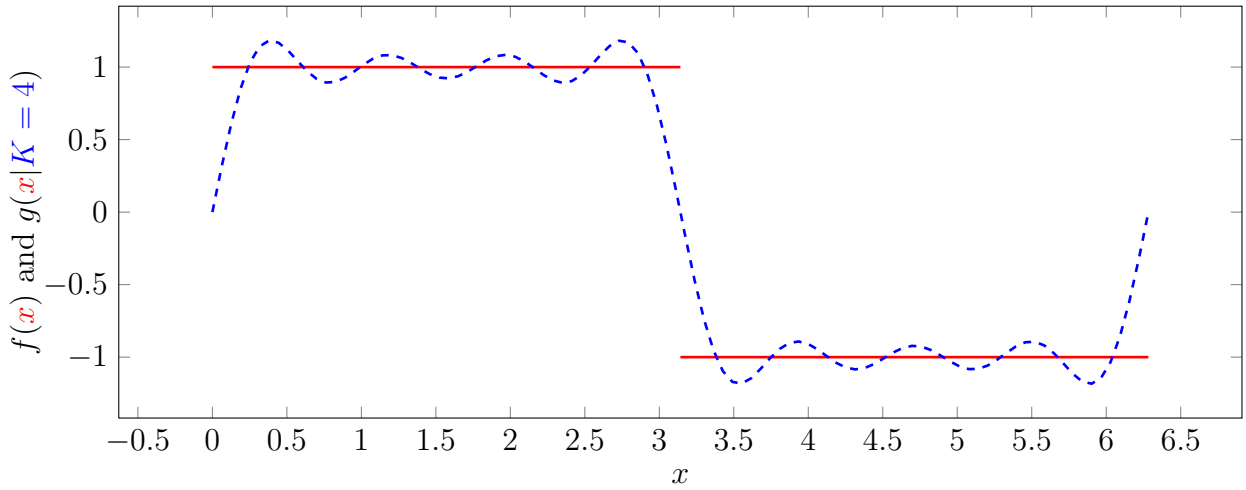
Exercise 01 (65% + 35%).

Consider the two following functions $g(x|K)$ and $f(x)$

$$g(x|K) = (4/\pi) \sum_{k=1}^{K} \left\{ (2k-1)^{-1} \sin\left[(2k-1)x\right] \right\}$$

$$f(x) = \begin{cases} +1, & x \in (0, \pi) \\ 0, & x = \pi \\ -1, & x \in (\pi, 2\pi) \end{cases} .$$

For K large enough, function $g(x|K)$ can be used as a good approximation of function $f(x)$.



Q1 Write a Python function that, given input arguments $x \in (0, 2\pi)$ and $K \in \{1, 2, \dots\}$, computes and returns the function values $g(x|K)$ and $f(x)$

Q2 Include your function into a program and use it to compute $g(x|K)$ and $f(x)$ when $K = 10$ and $x \in \{0, \pi/2, \pi, 3/2\pi, 2\pi\}$. Use lists to store all computed function values.