13.5
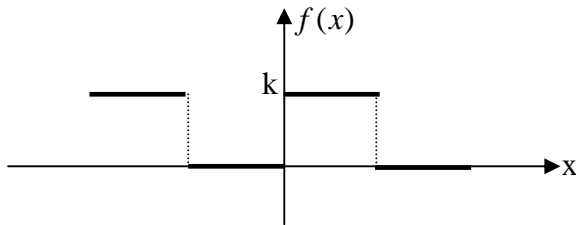
2.Let $f(x) = |x|$ for $-1 \le x \le 1$.

(a)Write the Fourier series for $f(x)$ on [-1,1].

(b)Show that this series can be differentiated term-by-term to yield the Fouries expansion of $f'(x)$ on [-1,1].

(c)Determine $f'(x)$ and write its Fourier series on [-1,1]. Compare this series with that obtained in (b).

13.6

Find the phase angle form of the Fourier series of the function.

12.

15.The RMS (root mean square) value of a function f over an interval [a,b] is

defind to be $RMS(f) = \sqrt{\dfrac{\int_a^b [f(x)]^2 \, dx}{b-a}}$. If f is periodic, this quantity is

evaluated over an interval of lengh equal to the fundamental period of f.

Determine RMS$(E\sin(\omega x))$, with E and ω positive constants.

13.7

Write the complex Fourier series of f, Determine what this series converges to , and plot some points of the frequency spectrum. Keep in mind that in specifying a function of period p, it is sufficient to define $f(p)$ on any interval of length p.

5. f has period 4 and $f(x) = \begin{cases} -1 & for \ \ 0 \le x < 2 \\ 2 & for \ \ 2 \le x < 4 \end{cases}$

12.Plot the phase spectrum of the periodic function of Problem 5.