

## Fourier series

**8.1** Find the Fourier series of functions.  $x \in \langle -\pi, \pi \rangle$

a)  $f(x) = |x|$

b)  $f(x) = \begin{cases} 0 & -\pi \leq x < 0 \\ x & 0 \leq x \leq \pi \end{cases}$

c)  $f(x) = x$

d)  $f(x) = x^2$

e)  $f(x) = \begin{cases} 2x & -\pi \leq x < 0 \\ 6x & 0 \leq x \leq \pi \end{cases}$

f)  $f(x) = \begin{cases} -c & -\pi \leq x < 0 \\ 0 & x = 0 \\ c & 0 < x \leq \pi \end{cases}$

g)  $f(x) = \begin{cases} 0 & -\pi \leq x < 0 \\ \sin x & 0 \leq x \leq \pi \end{cases}$

h)  $f(x) = |\sin x|$

i)  $f(x) = \sin(ax)$  where  $a$  is non-integer