December 4, 2016 Lecturer Dmitri Zaitsev

Course 2E01 2016 (SF Engineers & MSISS & MEMS)

S h e e t 9

Due: at the end of the tutorial

Exercise 1

Identify even and odd parts of the functions and find their Fourier series for $-\pi \leq x \leq \pi$:

(i) $f(x) = -x + 1$;

(ii) $f(x) = x \cos x$.

Exercise 2

Use Fourier series to find a solution of the equation

$$y''(x) + y'(x) = a(x),$$

where $a(x) = -x$ for $-\pi \leq x \leq \pi$.

Exercise 3

Find the Fourier integral representation of the function

$$f(x) = \begin{cases} 0 \text{ if } |x| > 1 \\ 1 + x \text{ if } |x| < 1. \end{cases}$$