

SS2065: INTRO TO PDEs

Summer School, 2012

Assignment 4: to be handed to your tutor during the tutorial on Monday 6 February

1. Given

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

and $f(x + 2\pi) = f(x)$

- (a) Sketch $f(x)$ for $-3\pi < x < 3\pi$
- (b) Calculate the Fourier Series (FS) for $f(x)$
- (c) Evaluate the FS at $x = 0$ and hence find the sum

$$1 + \frac{1}{9} + \frac{1}{25} + \cdots$$

- (d) What happens to the FS at $x = \pi$?