



LUND
UNIVERSITY

Fourier Analysis
Thursday August 26, 2010
Time: 08.00–13.00

Centre for Mathematical Sciences
Mathematics, Faculty of Science

Answers

1. a)

$$u(x) \sim \frac{2}{\pi} \sum_{k=-\infty}^{\infty} \frac{e^{2ikx}}{1-4k^2}.$$

b) $1/2$.

2.

$$u(x, t) = \frac{3}{4}e^{-3t} \sin x - \frac{1}{4}e^{-27t} \sin 3x.$$

3.

$$u(x) = \frac{\sin 5x}{x} - \frac{5\pi \sin x}{(1+5\pi)x}.$$

4. a) $\hat{f}(\xi) = 4 \cos(\pi\xi)/(1-4\xi^2)$.

b) $\pi/2$ and $\pi^2/8$, respectively.

5. b) $b - a$.