General Mathematics and CPS II

Exercise 20

April 24, 2015

1. Recall the definition of the Fourier series,

$$v(x) = \sum_{k=-\infty}^{\infty} \hat{v}_k \, \mathrm{e}^{\mathrm{i}kx} \, .$$

   Show that

$$\hat{v}_k = \frac{1}{2\pi} \int_0^{2\pi} \mathrm{e}^{-\mathrm{i}kx} \, v(x) \, \mathrm{d}x \, .$$

   (You may assume you can freely exchange summation and integration, and that all sums converge.)

2. Handout, Exercise 1.

3. Handout, Exercise 2.