

## Dugga

### Fourieranalys/Fourier Metoder, lp1, 2017

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Skriv ditt namn och personnummer - tydligt!

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1. (1P) Define the Fourier series of a function on  $[-\pi, \pi]$ . This includes defining the Fourier coefficients.

2. (1P) The Fourier series for  $f(x) = x = 2 \sum_{n \geq 1} \frac{(-1)^{n+1}}{n} \sin(nx)$ , for  $x \in (-\pi, \pi)$ . Evaluate

$$\sum_{n \geq 1} \frac{(-1)^{n+1}}{n} \sin(3\pi n/2).$$

3. (1P) Define the Fourier transform.

4. (1P) Define convolution.

5. (1P) What do you use to solve a PDE on  $\mathbb{R}$ : a Fourier series or the Fourier transform? What do you use to solve a PDE on  $[-42, 42]$ : a Fourier series or the Fourier transform?