

Math 121A: Homework 10 (due April 24)

1. Boas exercise 14.7.5
2. Boas exercise 14.7.10
3. Consider the function

$$f(x) = \frac{1}{1+x^4}.$$

Calculate its Fourier transform $\tilde{f}(\alpha)$ using residue calculus, for the range $\alpha \geq 0$. For $\alpha < 0$, find the solution using symmetry.

4. Use residue calculus to evaluate the integral

$$I = \int_{-\infty}^{\infty} \frac{1 - \cos x}{x^2} dx.$$

5. Boas exercise 14.7.33
6. Boas exercise 14.7.37
7. Boas exercise 14.7.40
8. Boas exercise 14.7.65