

# COMPLEX ANALYSIS II

## Exercise 8, Spring 2011

1. Calculate

$$\int_0^{\infty} \frac{dx}{(x^2 + a)(x^2 + b)},$$

where  $a, b > 0$ .

2. Calculate

$$\int_0^{\infty} \frac{dx}{x^6 + 1}.$$

3. Calculate

$$\int_0^{2\pi} \frac{dt}{a + \cos t},$$

where  $a > 1$ .

4. Calculate

$$\int_{-\infty}^{\infty} \frac{x \sin bx}{x^2 + a^2} dx,$$

where  $a, b > 0$ .

5. Calculate

$$\int_{-\infty}^{\infty} \frac{x \sin x}{x^2 - \pi^2} dx.$$

6. Calculate

$$\int_0^{\infty} \frac{\cos 2x}{(x^2 + 4)^2} dx.$$