

HOMWORK ASSIGNMENT 10 (Suggested)

Name:

1. Compute the Fourier transform of $\frac{x}{(x^2 + 1)^2}$.
2. Using Fourier transform, compute $\int_{-\infty}^{\infty} \frac{\sin(x)}{x(x^2 + 1)}$.
3. The function $f(x)$ has Fourier transform $\hat{f}(\omega) = \frac{1}{|\omega|^3 + 1}$. Compute

$$\int_{-\infty}^{\infty} |(f * f')(x)|^2 dx.$$

Hint: For problems 1, 2 and 3, look among the typical Fourier transforms, as well as the common properties (charts on page 345, 346 of W. Strauss book).

From W. Strauss book:

4. Section 12.3: Problem 4 (a),(b).
5. Section 12.4: Problem 1
6. Section 12.4: Problem 2
7. Section 12.4: Problem 6