

Homework Nine. Due Friday, October 30.

1. SOME FOURIER TRANSFORM EXERCISES.

Suppose $f : \mathbb{R} \rightarrow \mathbb{C}$ and

$$\int |f(x)| dx < \infty.$$

Show that if $a \in \mathbb{R}$ then

$$\widehat{\tau_a f}(\xi) = e^{-ia\xi} \hat{f}(\xi) \quad \text{for } \xi \in \mathbb{R}.$$

Show that if $0 < r < \infty$ then

$$\widehat{\delta_r f}(\xi) = r \hat{f}(r\xi) \quad \text{for } \xi \in \mathbb{R}.$$

Show that if $g : \mathbb{R} \rightarrow \mathbb{C}$ and

$$\int |g(x)| dx < \infty$$

then

$$\widehat{f * g} = \hat{f} \hat{g}.$$

2. LAW OF LARGE NUMBERS.

From 8.1 of the book do 8, 10, 12, 14; these start on page 312.

From 8.2 of the book do 2, 4, 6; these start on page 320.