

QUAL PREP SESSION 6

Problem 1

Compute $\hat{\chi}_{[-a,a]}$

Problem 2

True/False: $\sin(x)/x \in L^1(\mathbb{R})$. Use Fourier transform to justify your answer.

Problem 3

If $f, g \in \mathcal{S}$, show that $f * g$ is in \mathcal{S} .

Problem 4

Suppose $f, g \in L^1$ and $f * g = \frac{1}{2}(f * f + g * g)$. Show that $f = g$ (in L^1 so a.e.).

Problem 5

Let P be the space of polynomials in one variable. Consider $P \subset L^2([0, 1])$. Find P^\perp .
