Harmonic Analysis Homework 1

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September 28, 2020

Theorem 1. Let X be a Fréchet space, and let us index the countable family of seminorms with positive integers, i.e., $\|\cdot\|_1, |\cdot\|_2$, and so on. Check that d(x, y) := X j=1 2 j minkx ykj , 1 defines a distance on X and that it induces the same topology as the Frechet structure.

Proof. Blah, blah, blah. Here is an example of the `align` environment:

$$\begin{aligned}
\sum_{i=1}^{k+1} i &= \left(\sum_{i=1}^{k} i\right) + (k+1) \\
&= \frac{k(k+1)}{2} + k + 1 && \text{(by inductive hypothesis)} \\
&= \frac{k(k+1) + 2(k+1)}{2} \\
&= \frac{(k+1)(k+2)}{2} \\
&= \frac{(k+1)((k+1)+1)}{2}.
\end{aligned}$$

□

Problem 2. Let $n \in \mathbb{Z}$. Then yada yada.

Proof. Blah, blah, blah. I'm so smart. □