

Assignment 11, Book Problems: Due Apr 20

Chapter 12, # 7, 18, 25, 26.

Further Problem 5: Due Apr 27

(a double-credit problem) Compare Rudin's definition of $L^\infty(E)$ and the definition suggested in class of $L_E^\infty(\mathcal{X}, \Sigma)$. That definition had two parts. First, the E -essential range of a Σ -measurable function f , namely $\mathcal{R}_E(f)$, is given by $\mathcal{R}_E(f) := \left(\bigcup \{D_i : f^{-1}(D_i) = \emptyset\} \right)^c$ (the D_i are those used by Rudin). We then defined an equivalence relation on the Σ -measurable functions by $f \equiv g$ if $\mathcal{R}_E(f - g) = \{0\}$, and then defined $L_E^\infty(\mathcal{X}, \Sigma)$ as the equivalence classes of Σ -measurable functions with bounded essential ranges, modulo \equiv . In particular, in the context of Theorem 12.22, compare the "bounded Borel functions" Rudin uses so often with $L^\infty(E)$ and $L_E^\infty(\Delta, B(\Delta))$,

Assignment 10, Book Problems: Due Apr 11

Chapter 12, # 2, 3, 6.

Assignment 9, Book Problems: Due Apr 2

Chapter 11, # 17.

Assignment 8, Book Problems: Due Mar 19

Chapter 11, # 6, 9 – 11.

Further Problem 4: Due Mar 16?

Chapter 11, # 14.

Assignment 7, Book Problems: Due Mar 12

Chapter 11, # 1 – 5.

Further Problem 3: Due Mar 2

(a) Identify the continuous homomorphisms $\varphi : \mathbb{R}^n \rightarrow \mathbb{T}$ (here \mathbb{T} denotes the multiplicative group of complex numbers of unit length, with its relative topology) of the *additive* group \mathbb{R}^n into \mathbb{T} .

(b) Let $A := L^1(\mathbb{R}^n) + \mathbb{C}\delta$, where δ denotes the Dirac Delta, the multiplication is convolution, and the norm of $f + \alpha\delta$ is defined to be $\|f\|_1 + |\alpha|$. Identify the non-zero complex *algebra* homomorphisms $h : A \rightarrow \mathbb{C}$.

Assignment 6, Book Problems: Due Mar 5

Chapter 10, # 20, 21, 23 – 25.

Assignment 5, Book Problems: Due Feb 26

Chapter 10, # 16 – 19.

Assignment 4, Book Problems: Due Feb 19

Chapter 10, # 8, 9, 12, 13, 15.

Further Problem 2: Due Feb 16

Chapter 4, # 17.

Assignment 3, Book Problems: Due Feb 12

Chapter 10, # 2 – 5.

Math 8802, Spring 2001

Assignments are due at the start of class on the Due date

Assignment 2, Book Problems: Due ?

Chapter 4, # 13(b), 16(b); Chapter 10, # 1.

Assignment 1, Book Problems: Due ?

Chapter 4, # 9(b), 10, 13(a), 14, 16(a) and 16(d).

Further Problem 1: Due Jan 31

What are the “pre-compact sets” (sets with compact closure) in $L^p(\mathbb{R}^n)$, $1 \leq p < \infty$?