

520 SPRING 2025 PROBLEM SET #8

Problem 1. Prove directly that the automorphism group of the upper half plane \mathbb{H} is $\mathrm{PSL}_2(\mathbb{R})$, given by Möbius transformations, by starting with the fact that meromorphic functions on the extended complex plane are rational functions.

Problem 2. Chapter 8 exercise 1 in Stein and Shakarchi.

Problem 3. Chapter 8 exercise 10 in Stein and Shakarchi.

Problem 4. Chapter 8 exercise 12 in Stein and Shakarchi.

Problem 5. Chapter 8 exercise 15 in Stein and Shakarchi.