University of Washington
Complex Analysis - Math 535
S. Rohde Winter 2018

Exercise Set 4

Do problems 3.2, 3.6, 3.7, 3.8 of Schlag, A course in Complex Analysis and Riemann surfaces, and the following problem:

Problem 5. (Poisson integral in the half plane) Let $f : \mathbb{R} \to \mathbb{R}$ be bounded and continuous, and define ($z = x + iy$)

$$Pf(z) := \frac{1}{\pi} \int_{-\infty}^{\infty} \frac{y}{(x-t)^2 + y^2} f(t) dt.$$

Show that Pf is harmonic in the upper half plane, has a continuous extension to $\mathbb{R}$, and that $Pf = f$ on $\mathbb{R}$.

Due date : Monday, February 26, before class.