

Homework 9

Due April 21st on paper at the beginning of class. Please let me know if you have a question or find a mistake.

- Fisher Section 3.5: #1 and #2.

Hint: For the second problem, it will be helpful to use a mapping of the form $z \mapsto z^\beta$ for suitable β ; be careful to clearly explain what branch you are using, including the domain and range and how it is defined.

- Taylor Section 5.1: #2.

Hint: Use the result of the first problem above to reduce this to a problem in the upper half plane, where a mapping of the form $w \mapsto aw + b$ for suitable constants a and b does the job.

- Fisher Section 3.4: #3.

Hint: There is a solution sketch in the back of the book, but be sure to fill in the details if you use it.

- Taylor Section 4.2: #5.

Hint: Use the result of #3 from the same section, and mimic the proof of Proposition 4.2.10.

- Additional problem. Let $\Omega \subset \mathbb{C}$ be open, let $p \in \Omega$, and let $D = \{z \in \mathbb{C}: |z| < 1\}$. Let f_1 and f_2 be biholomorphic maps from Ω to D such that $f_j(p) = 0$ and $f'_j(p) > 0$ for each $j \in \{1, 2\}$. Use Example 4 from Fisher Section 3.4 to prove that $f_1 = f_2$.