

Math 210A Homework Assignment (11/21 – 11/30)

Assignment will not be collected.

Key notions introduced this long week:

- (1) Rouché's Theorem—undergraduate version and graduate version, algebraic number of zeros and poles;
- (2) Maximum Principle—boundary version;
- (3) Schwarz's Lemma;
- (4) Schwarz-Pick Theorem;
- (5) Hadamard Three Circles Theorem.

Homework problems:

Problem 1. A function f from the complex sphere $\hat{\mathbf{C}}$ to itself is meromorphic if both $f(z)$ and $f(\frac{1}{z})$ are meromorphic functions on \mathbf{C} . Prove that f has zero as the algebraic number of zeros and poles on $\hat{\mathbf{C}}$.

§6.1. 1, 2.

§6.2. 1, 2.

§6.3. 1, 4.