Final exam will cover the following topics: mapping of some holomorphic functions (e.g. rational function, sinh, cosh, sin, cos); integration of four types of functions (this is an application of residue theorem); argument principle (counting roots of polynomials in some special regions. Rouche's theorem is also required as a simple version of argument principle); Laurent series and Taylor series (integral formulas to calculate associated coefficients); maximum modulus theorem; removability of singularities; Cauchy integral formulas.

Sample Problems:

1. Homework problems

2. Examples in Sect. 103-106

3. Examples in Sect. 64, 68

4. Consider the function $f$ which satisfies

$$|f(z)| \leq \frac{\sin |z|}{|z|}, \qquad \text{in } \{z : 0 < |z| < \pi\}.$$

What can you tell about the Laurent series of $f$ ? What can you tell about function $f$.

5.Examples in Sect. 54-55.

Good Luck in you final !