

What you are supposed to know from Matte 4

Complex numbers

1. Definition, Cartesian and polar (exponential) representation
2. Arithmetic in Cartesian and polar representation
3. topology of the complex plane
4. domains and curves

Analytic functions

1. definition
2. Cauchy-Riemann equations
3. Examples
 - (a) Power functions
 - (b) Exponential function
 - (c) Logarithm functions
 - (d) Superposition
4. Real and imaginary parts of analytic function
5. Cauchy theorem
6. Integral Cauchy theorem
7. Formulas for the derivatives
8. Power expansion
 - (a) Taylor series
 - (b) uniqueness theorem
 - (c) analytic continuation
 - (d) Liouville theorem
 - (e) Laurent series
 - (f) isolated singularities

9. Residues calculus

- (a) Definition
- (b) Cauchy theorem