

Plan of the Lecture

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Local behavior

1. Reminder: Taylor series

Order of a zero

2. Model case: Behavior of z^a monomial:

- Takes all values
- Open angles.

3. Nearest goals:

1. Study the local behavior near zeros of order n

2 Study local behavior near isolated singularities

4. Isolated singularities: definition.

~~4. Cauchy's theorem~~

5. Reminder: Laurent expansion, formula for the coefficients, regular and principal parts.

6. Classification of isolated singularities:

removable

poles

essential sing.

7. Examples.

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8. Analyzing the model case of essential singularity $e^{1/z}$!

- absence of limit

↳ - takes any value except 0 and ∞ .

9. Formulation of theorem about classification of isolated singularities:

removable \Leftrightarrow boundedness

pole \Leftrightarrow goes to ∞

essential \Leftrightarrow no limit. (no proof so far)

10. Formulation of the Picard theorem (with no proof).

11. Formulation of the Weierstrass theorem (no proof so far).

12. Starting to prove the theorem about behaviour:

- Removable \Leftrightarrow boundedness.

Pole \Rightarrow goes to infinity.

13. Definition: Order of pole.