Theory of Combinatorics

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Bridges of Königsberg Problem



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Leonhard Euler



Figure: Leonhard Euler (1707-1783)

What is combinatorics?

Combinatorics is an area of mathematics primarily concerned with counting, both as a means and an end in obtaining results, and certain properties of finite structures.

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Combinatorics in mathematics



Branches of combinatorics

- Graph theory
- Enumeration and counting
- Design theory
- Order theory

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- Matroid theory
- Combinatorial optimization

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What can combinatorics do for?

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- Computer science
- Cryptography
- Information theory
- Physics
- Chemistry
- Biology
- Economy
- Music
- ► ...

Thank you!

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