Why

[1]

Problem

Consider the sequence $(a_n)_{n \in \mathbb{N}}$ defined by

$$a_n = \frac{1}{n^2}.$$

Does $\lim_{N \to \infty} \sum_{n=1}^{N} a_n$ exist? If so, what is the limit? These questions are known as the *Basel problem.*

Solution

Proposition 1.
$$\lim_{N \to \infty} \sum_{n=1}^{N} s_n = \frac{\pi^2}{6}.\text{[2]}$$

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[1]Future editions will include. Future editions may also rename this sheet.

[2]Future editions will include a proof.

Basel Problem

Real Series

Real Limits

Absolute Value

Interval Length

Intervals

Real Line

Real Order   Real Sequences

Real Numbers

Integral Line   Rational Numbers

Integer Arithmetic   Sequences

Natural Additive Identity   Natural Multiplicative Identity   Set Numbers   Direct Products

Arithmetic   Identity Elements

Integer Products   Natural Powers   Operations   Finite Sets

Integer Sums   Natural Products   Equivalent Sets   Family Unions and Intersections

Integer Numbers   Natural Sums   Comparisons   Function Inverses   Families

Equivalence Relations   Recursion Theorem   Orders   Natural Order   Function Images   Function Composites   Converse Relations   Functions

Peano Axioms   Relations

Natural Induction   Set Products

Natural Numbers   Set Powers   Generalized Set Dualities

Partitions   Successor Sets   Intersection of Empty Set   Unordered Triples   Set Dualities   Set Unions and Intersections

Set Intersections   Pair Unions   Ordered Pairs   Set Complements

Set Differences   Set Unions   Pair Intersections

Unordered Pairs   Empty Set

Geometry   Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Sets   Identities

Names

Letters   Objects