Why

[1]

Problem

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

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

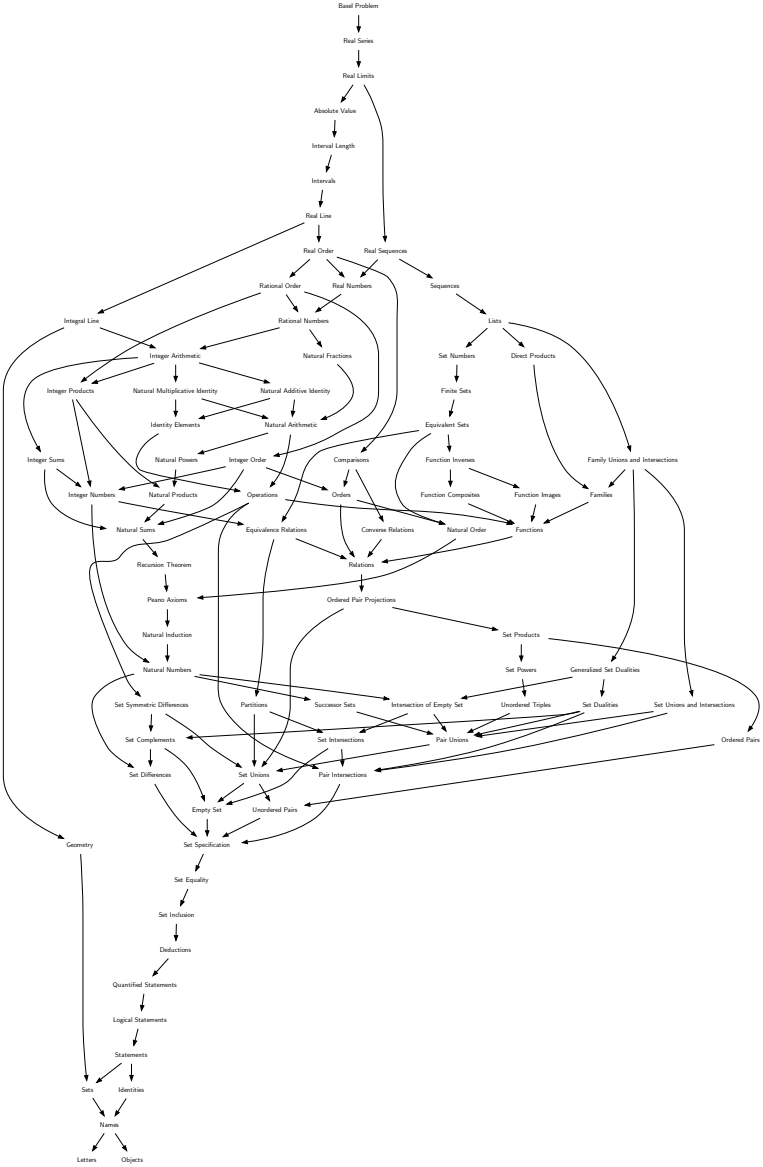
Does $\lim_{N\to\infty} \sum_{n=1}^{N} a_n$ exist? If so, what is the limit? These questions are known as the *Basel problem*.

Solution

Proposition 1.

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

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


Basel Problem
Real Series
Real Limits
Absolute Value
Interval Length
Intervals
Real Line
Real Order
Real Sequences
Rational Order
Real Numbers
Sequences
Integral Line
Rational Numbers
Lists
Integer Arithmetic
Natural Fractions
Set Numbers
Direct Products
Integer Products
Natural Multiplicative Identity
Natural Additive Identity
Finite Sets
Identity Elements
Natural Arithmetic
Equivalent Sets
Integer Sums
Natural Powers
Integer Order
Comparisons
Function Inverses
Family Unions and Intersections
Integer Numbers
Natural Products
Operations
Orders
Function Composites
Function Images
Families
Natural Sums
Equivalence Relations
Converse Relations
Natural Order
Functions
Recursion Theorem
Relations
Peano Axioms
Ordered Pair Projections
Natural Induction
Set Products
Natural Numbers
Set Powers
Generalized Set Dualities
Set Symmetric Differences
Partitions
Successor Sets
Intersection of Empty Set
Unordered Triples
Set Dualities
Set Unions and Intersections
Set Complements
Set Intersections
Pair Unions
Ordered Pairs
Set Differences
Set Unions
Pair Intersections
Empty Set
Unordered Pairs
Geometry
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects