Why

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Definition

Let S be the sphere in $\mathbf{R}^3$ and let $N = (0, 0, 1)$, the north pole. Then the *stereopgraphic projection* of $S - \{N\}$ is the function $\pi : S - \{N\} \to \mathbf{R}^2$ defined as follows. The point $\pi(p)$ is the (x, y) values for the point where the line through N and p intersects the plane plane $P = \{(x, y, z) \in \mathbf{R}^3\} z = 0$ (the "xy-plane").[2]

Proposition 1. *The stereographic projection is a diffeomorphism.*

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[1]Future editions will include, the historical motivation is obviously cartography.

[2]Future editions will expand.

Stereographic Projection

Smooth Manifolds

Real Neighborhoods · Smooth Functions

Smooth Multivariate Functions

Real Balls · Smooth Real Functions

Higher Order Derivatives

Second Derivatives · Partial Derivatives

Real Open Sets · Multivariate Functions · Differentiable Functions

N-Dimensional Space

Distance · Real Functions

Space Distance

Plane Distance

Interval Length

Real Space · Intervals

Real Plane · Real Line

Real Order · Integral Line

Geometry · Rational Order · Real Numbers

Rational Numbers

Lists · Integer Arithmetic

Set Numbers · Natural Multiplicative Identity · Natural Additive Identity · Integer Products

Finite Sets · Identity Elements · Arithmetic · Natural Powers

Direct Products · Equivalent Sets · Comparisons · Integer Order · Integer Sums · Natural Products

Family Unions and Intersections · Function Inverses · Operations · Orders · Integer Numbers · Natural Sums

Families · Function Composites · Function Images · Natural Order · Recursion Theorem

Functions · Converse Relations · Equivalence Relations · Peano Axioms

Relations

Set Products · Natural Induction

Generalized Set Dualities · Set Powers · Natural Numbers

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

Ordered Pairs · Pair Unions · Set Intersections · Set Complements

Pair Intersections · Set Unions · Set Differences

Unordered Pairs · Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deduction

Quantified Statements

Logical Statements

Statements

Sets · Identities

Names

Letters · Objects