Why

If we have two manifolds, is there product a manifold?

Result

The answer is yes.

Proposition 1. *Let X and Y be manifolds. Then $X \times Y$ is a manifold and $\dim X \times Y = \dim X + \dim Y$.*[1]

---

[1] Future editions will include an account.

Product Manifolds

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

Geometry — Real Order — Integral Line

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 — Integer Order — Integer Sums — Natural Products

Family Unions and Intersections — Function Inverse — Function Images — Operations — Comparisons — Orders — Integer Numbers — Natural Sums

Families — Function Composites — Functions — Converse Relations — Equivalence Relations — Natural Order — Recursion Theorem

Relations — Peano Axioms

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 Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Sets — Identities

Names

Letters — Objects

4