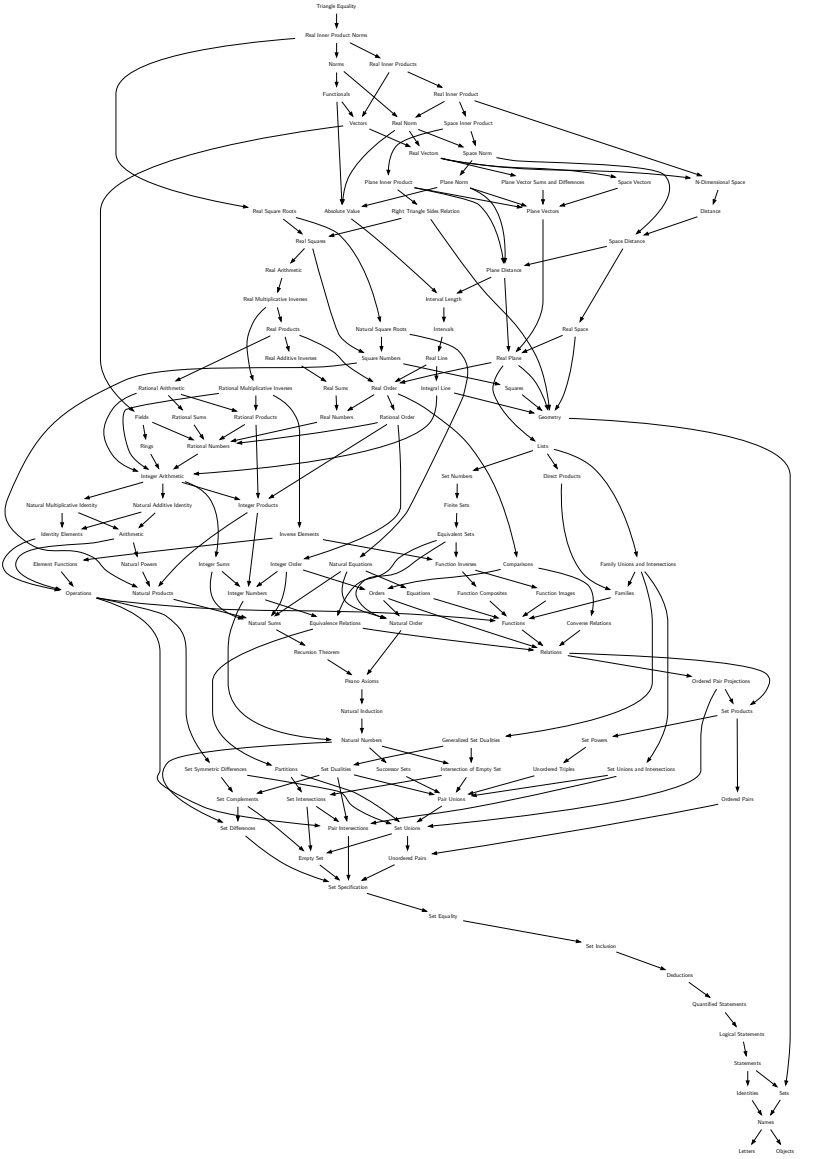
Why

The squared norm of a sum of orthogonal vectors is the sum of their squared norms.

Result

Proposition 1. *Let (V, F) be an inner product space with induced norm $\|\cdot\|$. Let $x, y \in V$ be orthgonal vector. Then*

$$\|x + y\|^2 = \|x\|^2 + \|y\|^2.$$


Triangle Equality
Real Inner Product Norms
Norms
Real Inner Products
Functionals
Real Inner Product
Vectors
Real Norm
Space Inner Product
Real Vectors
Space Norm
Plane Inner Product
Plane Norm
Plane Vector Sums and Differences
Space Vectors
N-Dimensional Space
Real Square Roots
Absolute Value
Right Triangle Sides Relation
Plane Vectors
Distance
Real Squares
Space Distance
Real Arithmetic
Plane Distance
Real Multiplicative Inverses
Interval Length
Real Products
Natural Square Roots
Intervals
Real Space
Real Additive Inverses
Square Numbers
Real Line
Real Plane
Rational Arithmetic
Rational Multiplicative Inverses
Real Sums
Real Order
Integral Line
Squares
Geometry
Fields
Rational Sums
Rational Products
Real Numbers
Rational Order
Rings
Rational Numbers
Lists
Integer Arithmetic
Set Numbers
Direct Products
Natural Multiplicative Identity
Natural Additive Identity
Integer Products
Finite Sets
Identity Elements
Arithmetic
Inverse Elements
Equivalent Sets
Element Functions
Natural Powers
Integer Sums
Integer Order
Natural Equations
Function Inverses
Comparisons
Family Unions and Intersections
Operations
Natural Products
Integer Numbers
Orders
Equations
Function Composites
Function Images
Families
Natural Sums
Equivalence Relations
Natural Order
Function
Converse Relations
Recursion Theorem
Relations
Peano Axioms
Ordered Pair Projections
Natural Induction
Set Products
Natural Numbers
Generalized Set Dualities
Set Powers
Set Symmetric Differences
Partitions
Set Dualities
Successor Sets
Intersection of Empty Set
Unordered Triples
Set Unions and Intersections
Set Complements
Set Intersections
Pair Unions
Ordered Pairs
Set Differences
Pair Intersections
Set Unions
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects