**Why**

We talk about angles in the plane using the language of vectors.

**Definition**

The *angle* (*unsigned angle*) between $x \in \mathbf{R}^2$ and $y \in \mathbf{R}^2$ is the real number

$$\theta = \angle(x, y) = \cos^{-1} \frac{x^\top y}{\|x\| \|y\|}$$

Plane Vector Angles

Plane Norm

Plane Vectors  Plane Distance  Absolute Value

Interval Length

Intervals

Real Plane  Real Line

Integral Line  Real Order

Geometry  Real Numbers  Rational Order

Lists  Rational Numbers

Direct Products  Set Numbers  Integer Arithmetic

Finite Sets  Natural Additive Identity  Natural Multiplicative Identity  Integer Products

Equivalent Sets  Identity Elements  Arithmetic

Family Unions and Intersections  Function Inverses  Comparisons  Natural Powers  Integer Order  Integer Sums

Families  Function Composites  Function Images  Operations  Orders  Natural Products  Integer Numbers

Functions  Converse Relations  Natural Order  Equivalence Relations  Natural Sums

Relations  Recursion Theorem

Ordered Pair Projections  Peano Axioms

Set Products  Natural Induction

Generalized Set Dualities  Set Powers  Natural Numbers

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