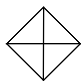


Why

We are constantly thinking of the integers as the endpoints of equal length segments of a line.

Discussion

We commonly associate elements of the integers with the endpoints of equal-length segments of a real line. Take segment S_0 of L with endpoints p and q. Associate the point p with 0. Associate the point q with 1. Take a segment S_1 of equal length, non-overlapping with S_0, who shares the endpoint q. Associate the second endpoint of this segment 2. Continue with the rest.[1] We call the line so formed the *integral line* of unit S_0.

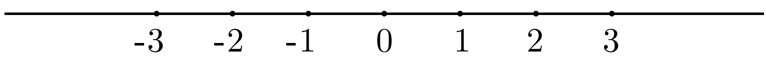


Figure 1: The integral segments.

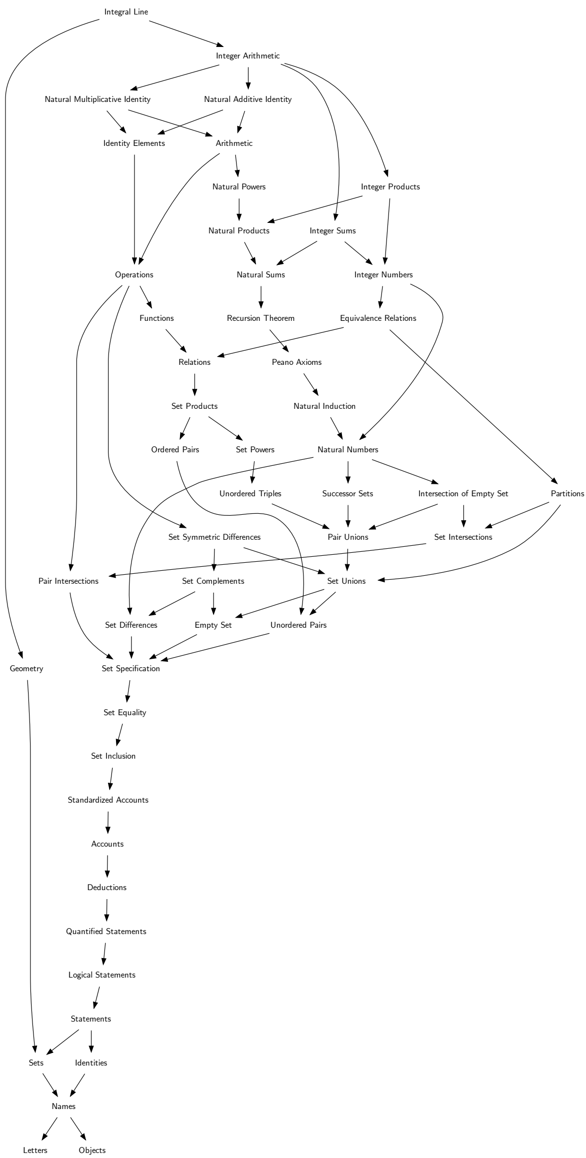
Integral Distance

Let $f : \mathbf{Z} \to \mathbf{Z}$ be defined by $f(a, b) = a - b$ if $a > b$ and $f(a, b) = b - a$ if $b > a$. Notice that f is symmetric: $f(a, b) = f(b, a)$. The (geometric) interpretation of f is the distance between the points associated with the two integers $a, b \in \mathbf{Z}$ in some integral line. We call f the *integral distance*. Notice that $f(a, b) > 0$ for all $a, b \in \mathbf{Z}$.

Notation

We denote the distance between $a, b \in \mathbf{Z}$ by $|a - b|$.

[1] Future editions will expand.


Integral Line
Integer Arithmetic
Natural Multiplicative Identity
Natural Additive Identity
Identity Elements
Arithmetic
Natural Powers
Integer Products
Natural Products
Integer Sums
Operations
Natural Sums
Integer Numbers
Functions
Recursion Theorem
Equivalence Relations
Relations
Peano Axioms
Set Products
Natural Induction
Ordered Pairs
Set Powers
Natural Numbers
Unordered Triples
Successor Sets
Intersection of Empty Set
Partitions
Set Symmetric Differences
Pair Unions
Set Intersections
Pair Intersections
Set Complements
Set Unions
Set Differences
Empty Set
Unordered Pairs
Geometry
Set Specification
Set Equality
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Names
Letters
Objects