Why

We want to talk about several uncertain outcomes at once.

Definition

An *event* (or *compound event*, *random event*) is a subset of outcomes.

Algebra of events

For events $A, B \subset \Omega$, we interpret $A \cup B$ as the event that either A *or* B occurs. Similarly we interpret $A \cap B$ as the event that *both* A *and* B occur. We interpret $\Omega - A$, the *complement* of A in Ω, as the event that A *does not* occur.

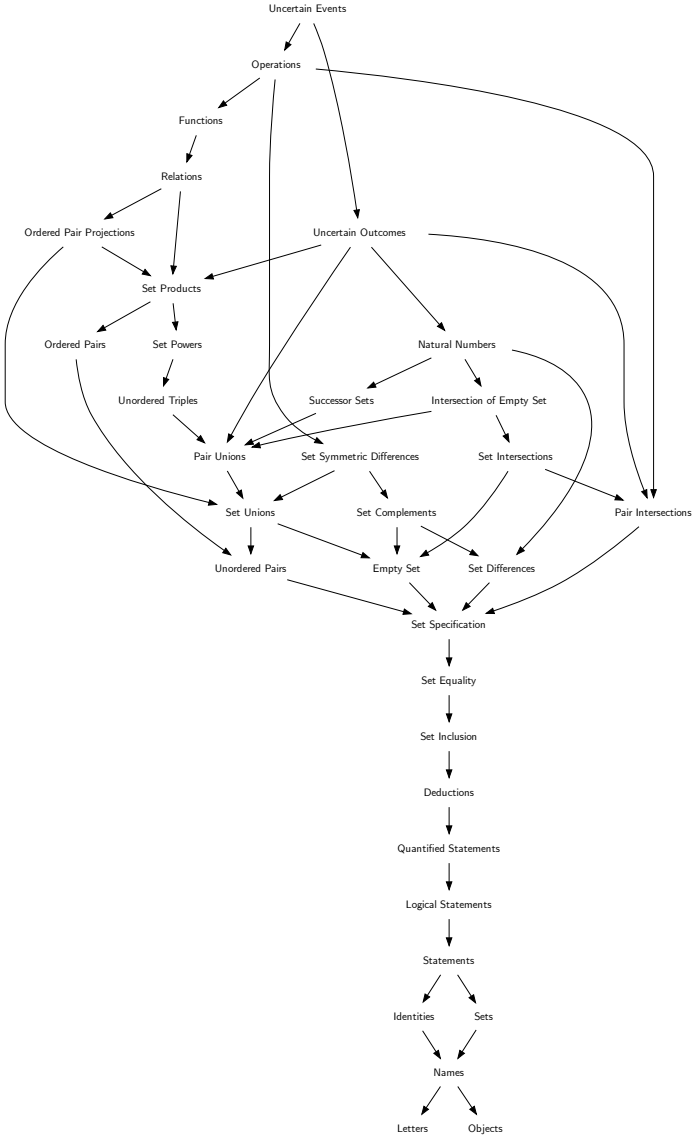
Examples

Even or odd number of pips. As usual, we model a die roll with outcomes $\{1, 2, 3, 4, 5, 6\}$. We may model the event that the number of pips is odd with the set $\{1, 3, 5\}$. Similarly, we may model the event that the number of pips is even with the set $\{2, 4, 6\}$.

Rolling doubles. Suppose we model rolling two dice with the outcome set $\{1, \ldots, 6\}^2$. The event of rolling "doubles"—the two die show the same number of pips—can be modeled as the set D defined by

$$D = \{(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)\}.$$

We may model the event that the die turns up four as the set $\{4, 5, 6\}$.


Uncertain Events
Operations
Functions
Relations
Ordered Pair Projections
Uncertain Outcomes
Set Products
Ordered Pairs
Set Powers
Natural Numbers
Unordered Triples
Successor Sets
Intersection of Empty Set
Pair Unions
Set Symmetric Differences
Set Intersections
Set Unions
Set Complements
Pair Intersections
Unordered Pairs
Empty Set
Set Differences
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects