**Why**

The product of two sets is a (sub)set of ordered pairs. Is every set or ordered pairs a subset of a product of two sets?

**Result**

The answer is easily seen to be yes. Let $R$ denote a set or ordered pairs. So for $x \in R$, $x = \{\{a\}, \{a, b\}\}$. First consider $\bigcup R$. Then $\{a\} \in \bigcup R$ and $\{a, b\} \in \bigcup R$. Next consder $\bigcup\bigcup R$. Then $a, b \in \bigcup\bigcup R$. So if we want to sets—denote them by $A$ and $B$—so that $R \subset A \times B$, we can take both $A$ and $B$ to be the set $\bigcup\bigcup R$.

We often want to shrink the sets $A$ and $B$ to only include the relevant members. In other words, we specify the elements of $\bigcup\bigcup R$ which are actually a first coordinate or second coordinate for some ordered pair in the set $R$. In other words, we define $A' = \{a \in A \mid (\exists b)((a, b) \in R)\}$ and likewise $B' = \{b \in B \mid (\exists a)((a, b) \in R)\}$. We call $A'$ the *projection of R onto the first coordinate* and $B'$ the *projection of R onto the second coordinate*.

Ordered Pair Projections

Set Products

Set Powers

Ordered Pairs

Unordered Triples

Pair Unions

Set Unions

Unordered Pairs

Empty Set

Set Specification

Set Equality

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects