

Discrete Mathematics

Sets and Functions

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Cartesian Products

Ordered Pairs

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Note: $(x, y) \neq (y, x)$ unless $x = y$.

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Note: $A \times B \neq B \times A$.

Cardinality

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Example. Find $|A \times B|$ if $A = \{1,2\}$ and $B = \{a, x, z\}$.

Triples and n-Tuples

Similar to ordered pairs, we can record n data by writing
 (a_1, a_2, \dots, a_n) .

We can also build $A_1 \times A_2 \times \dots \times A_n$, the **Cartesian product** of sets A_1 to A_n .

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Example. $A_1 = \{1,2\}$, $A_2 = \{a, b\}$ and $A_3 = \{x\}$. What is
 $A_1 \times A_2 \times A_3$?

Exercise

We write $A \times A$ as A^2 , $A \times A \times A$ as A^3 , etc.

Question. $A = \{T, F\}$. Find A^2 and A^3 .