

Actions on Collections. Package Concept

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Abstract: To 'plam is one of the basic concepts of mathematics. We will study it based on examples. Here we can talk about a set of pedagogical college students, a set of solutions of the inequality $x + 1 > 0$, a set of chairs in the auditorium. In real life, special words can be used instead of the word collection, such as herd, gala, herd, and so on.

Keywords: Sets and elements of a link, a set of all non-negative numbers, a set of elements.

INTRODUCTION

Any object that makes up a collection is called its elements. For example, number 3 is an element of a set of natural numbers, and April 4 is the fourth day of April.

The relationship between a set and its elements is described by the word "appropriate". The number 3 can be said to belong to a set of natural numbers.

Different comments about collections and link elements can be replaced with short notes, or more precisely, symbols. Typically, a collection is written in capital letters of the Latin alphabet, its elements are lowercase, and the corresponding word is marked with "£".

element a belongs to set A, the comment a is written as $a \in A$. element a does not belong to set A, the comment is written as $a \notin A$ (or $a \notin A$). For example, for some elements of set A, the statements $16 \in A$, $328 \in A$, $17 \notin A$, $1 \notin A$ are true. There are special characters for some numeric packages. For example, all sets of natural numbers are denoted by N, all sets of non-negative numbers are denoted by Z₀, all sets of integers are denoted by Z, all sets of rational numbers are denoted by Q, and all sets of real numbers are denoted by R.

METHODS

Collection items can be finite or unlimited. For example, the set of subjects taught is limited, but the set of points on a straight line is infinite.

$A = \{a \setminus b \setminus c; d\}$ and $B = \{c \setminus d; \text{Let } e\}$ be a set. A set $P = \{c \setminus d\}$ consisting of elements belonging to A and B at the same time is the intersection of the sets, which is written as $A \cap B$, where \cap denotes the intersection of the sets.

If sets A and B do not have common elements, they do not intersect, and $A \cap B = \emptyset$. Also for any sets A, B and C:

$$(A \cap B) = B \cap A$$

$$(A \cap B) \cap C = A \cap (B \cap C).$$

If $A \subset B$, then $A \cap B = A$. In particular, $A \cap A = A$, $A \cap \emptyset = \emptyset$, $A \cap J = A$, the universal set ($J = A$).

A set of elements belonging to at least one of the sets A and B is their combination, and $A \cup B$ is denoted by B, where "U" is the combination symbol. For example, $A = \{m \setminus n \setminus p \setminus k \setminus \}$ and $B = \{p \setminus r \setminus \$; \text{The combination of } n\}$ sets is $A \cup B = \{m \setminus n \setminus p \setminus k \setminus l \setminus r \setminus j\}$.

Let A be the first-year students of the pedagogical college and B the second year students. The $A \cup B$ package may include first-year or second-year students. These may include first-year students or second-year students or first- and second-year students.

Properties:

1) for any sets A and B, $A \cup B = B \cup A$ (commutative);

2) for any sets A, B and C $(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$;

3) If $B \subset A$, then $A \cup B = A$. In particular, $A \cup A = A$, $A \cup \emptyset = A$, $A \cup J = J$;

4) for any A, B and C sets

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C),$$

The equations $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ are valid.

Let set B be part of A. A set of elements of set A that does not belong to B is filled with B and is denoted by B^c .

If A is a set of first-year students, B is a set of first-year girls, and B^c is a set of boys.

1- example. $A = \{2; 3; 4\}$ Write all the part sets of the set.

Solution. One-element part sets $\{2\}$, $\{3\}$, $\{4\}$, two-part part sets $\{2; 3\}$, $\{2; 4\}$, $\{3; 4\}$, as well as the set A itself, i.e. $\{2; 3; 4\}$ and an empty set \emptyset are sampled. So, given set A has 8 sets.

2- example. Using the numbers 5 and 3, explain the essence of the problem of the part set feeder.

Solution. We take 5 notebooks and separate 3 of them and count the rest. So 2 notebooks remain. From this, in general, a colored part with b elements is removed from a given set with elements a, and the rest of the set is colored with a - b elements.

3- example. $A = \{1; 2; 3; 5\}$, $B = \{1; 5\}$ boisa, $A \cap B = \{1; 5\}$ boiadi.

Y e c h i s h. By definition, $A \cap B = \{1; 5\}$ boiadi.

It should be noted that \mathbb{N} is a set of all natural numbers,

Since \mathbb{Z} is the set of all integers, \mathbb{Q} is the set of all rational numbers, \mathbb{R} is the set of all real numbers, and $\mathbb{N} \subset \mathbb{Z} \subset \mathbb{Q} \subset \mathbb{R}$ is the set, so the set \mathbb{R} is a universal set for the remaining sets of numbers.

The difference between A and B is the set of all elements of A that are not included in B, and is denoted by $A \setminus B$.

$A = \{a; b; c; d; e\}$, $B = \{b; d; e; k; f; n\}$ boisa, $A \setminus B = \{a; c\}$ boiadi.

4- example. You can easily verify the following:

A is the set of all even numbers $A = \{2n \mid n \in \mathbb{N}\}$, B is the set of all odd numbers $B = \{2n-1 \mid n \in \mathbb{N}\}$, then $A \cup B = \mathbb{N}$;

$A = \{a \mid 10 < a < 19, a \in \mathbb{N}\}$, $B = \{b \mid 11 < b < 14, b \in \mathbb{N}\}$; then $A \cap B = \{11, 12, 13\}$;

$A = \{a \mid |a| < 4, a \in \mathbb{R}\}$, $B = \{b \mid |b| < 2, b \in \mathbb{R}\}$. $A \cup B = \{x \mid -4 < x < 4\}$;

If $B \subset A$, then $A \cup B$ is denoted by A , and set B^c is a complement to set A;

The set of all ordered pairs in the form (a; b) derived from set A, element 2, and set B of sets y4 and B is called the Cartesian product of A and B, and $A \times B$ or $A \cdot B$ is marked in the view. $A \times B = \{(a; b) \mid a \in A \text{ and } b \in B\}$. If $A = \{2; 3; 4; 5\}$, $B = \{a; b; c\}$, then $A \times B = \{(2; a), (2; b), (2; c), (3; a), (3; b), (3; c), (4; a), (4; b), (4; c), (5; a), (5; b), (5; c)\}$.

RESULTS

Let A be the first-year students of the pedagogical college and B the second year students. The A U B package may include first-year or second-year students. These may include first-year students or second-year students or first- and second-year students. Properties:

- 1) for any sets A and B, $A \cup B = B \cup A$ (commutative);
- 2) for any sets A, B and C $(A \cup B) \cup C = A \cup (B \cup C)$;
- 3) If $B \subset A$, then $A \cup B = A$. In particular, $A \cup A = A$, $A \cup \emptyset = A$, $A \cup J = J$;
- 4) for any A, B and C sets

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