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True and False Thoughts, Quantities.

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Abstract: *True or false statements are called comments. For example, the words "Tashkent, the capital of Uzbekistan", "4 pairs of numbers" are true statements, and "Students graduating from pedagogical colleges are given the profession of a nurse" are examples of false statements. In general, each statement can have two values: true (1) and false (0).*

Keywords: arbitrary, any, each, all (all) common quantifiers and existing, some, found, at least one quantifiers.

INTRODUCTION

If both statements A and B are true, then statements A and B are true. If any of these are false, then statement "A and B" is false.

1- example. The number 12 is even and divisible by 5. Determine if the comment is true or false.

Solution. The comment is a comment of the form "A and B", A is "12 is even" and B is "12 is divisible by 5". Obviously, statement A is true and statement B is false (because the number 12 is not divisible by 5). This leads to the falsity of the judgment given.

2- example. Can 6 small or equal 11 comments be true?

Y e c h i s h. This complex expression looks like "A or B", A is "6 small 11", B is "6 is equal to 11". Apparently, A is true and B is false. Hence the truth of the reasoning given. So if one of the statements A and B is true, then the statement "A or B" is true.

METHODS

3- example. Can 7 small or 5 comments be true?

Y e c h i s h. This is an "A or B" feedback, A is "7 small 5" and B is "7 equal to 5". Obviously, feedback A is false and comment B is false. That fact must be taken into account. " This means that if both of the AvzB statements are false, then the "A or B" statement is false.

4- example. «14 tub son». Explain the sentence.

Y e c h i s h. This is a false assumption because the number 14 is not only divisible by 1, but also by 2, 7, or 14. It is incorrect to say that 14 is a prime number. That's the decent thing to do, and it should end there. Thus, the negation of the statement "14 prime numbers" can be written as "14 is not an prime number." That's the decent thing to do, and it should end there.

It is generally accepted that the negation of comment A is marked as A and is read as "not A."

In general, if A is true, then A is false, and if A is true, then A is true.

The truth table of comments with the words "and", "or", "not" is as follows:

A B A and B A or B A are not

1 1 1 1 0

1 0 0 I 0

0 1 0 1 1

0 0 0 0 1

So the truth of complex reasoning depends on the truth of simple reasoning.

Let's talk about the meaning of the words "all" and "some". The following comments can be made about the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9:

1) all numbers are single-digit numbers;

2) Some of the numbers are even numbers.

In general, there are right and wrong opinions. Generally, we consider right opinions to be true and false opinions to be false opinions.

If the word "all" is removed from sentence 1, the sentence "numbers are one-digit numbers" is formed. "Is this sentence true or false?" the question does not make sense. So the word "all" involved makes it a comment.

Sentence 2 has a similar structure, except that "numbers are even numbers" and the word "some" makes sense. The words "all" and "some" are called quantifiers. The word "quantifier" is Latin and means "how much." There are also common quantifiers "arbitrary", "any", "each", "all" and "existing", "some", "found", "at least one".

Many mathematical sentences have the form of a quantifier, for example: all squares are right rectangles, some even numbers are divisible by 4, the sum of the interior angles of an arbitrary right rectangle is 360 °. ga teng.

In most cases, the quantifiers in the mind are dropped. For example, the substitution law for adding numbers is written as a + b = b + a. For arbitrary numbers a and b, the equation a + b - b + a means that the law of substitution of addition is an idea involving common quantifiers.

5- example. An arbitrary number 0, 1,2, 3, 4, 5, 6, 7, 8, 9 is the solution of the inequality x + 2> x. Are these ideas true or false?

Ye c h i s h. To make sure that the arbitrary numbers 0, 1, 2, ..., 9 are solutions of the inequality x + 2> x, the following cases are considered:

x = 0 where 0 + 2> 0, which means that the numerical inequality is true.

At x = 1, 1 + 2> 1, so the numerical inequality is true.

x = 2da2 + 2> 2, which means that the numerical inequality is true.

x = 9da9 + 2> 9, which means that the numerical inequality is true.

Indeed, one of the numbers 0, 1, 2, ..., 9 is the solution of the inequality x + 2> x, i.e.

Any number 0, 1, 2, ... 9 is a solution of the inequality x + 2> x.

How did we figure this out? We have proven this by reviewing all private and possible cases. The method used to prove it is called complete induction.

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6- example. The sum of any three consecutive natural numbers is divisible by 3. Is this idea true or false?

Y e c h i s h. The method of proof used for the first sentence cannot be used here because we cannot consider all the cases.

Consecutive natural numbers are denoted by x, x + 1, x + 2, and it is proved that at any x the sum of x + (x + 1) + (x + 2) is divisible by 3. The expression x + (x + l) + (x + 2) can be written as x + x + + l + x + 2 = 3x + 3 = 3 (x + l). Since the number 3 is divisible by 3, the product is also divisible by 3. So the sum of any three consecutive natural numbers is also divisible by 3

7- example. An arbitrary rectangle is a square. How is the given idea structured?

Y e c h i s h. This is a lie. To make sure, just draw a non-square rectangle.

In general, the generality quantifier is determined by proving the validity of the ideas involved.

Consider the assumption that there are 3 natural numbers and that there are right-angled equilateral triangles.

The first thought is true. It suffices to cite an example to substantiate this conclusion. For example, 9 is a natural number and it is divisible by 3.

The second idea is a lie. In fact, one angle of a right triangle must be 90 °, and all the angles of an equilateral triangle must be 60 °. So there are no equilateral triangles between right triangles.

In general, the validity of an idea in which the existence quantum is involved is determined by giving examples. In fact, all ideas of a general nature are those in which the generality quantifier is involved. The following points are similar:

1) a + b = b + a; 3) 0 + a = a; 5) ab = ba;

2) 0 ■ a = 0; 4) 1 • a = a; 6) a: 1 = a.

Indeed, for any natural numbers b and a, the substitution property of addition and multiplication is valid: 0 + a - a, 0 • a = 0 for any number a.

"All natural numbers are divisible by 3." It is easy to be convinced that this is a false consideration. For example, 17 natural numbers are not divisible by 3.

The negation of a given comment is constructed as follows. "Dividing all natural numbers by 3 is a lie." This statement is true and is the same as the statement that "there are natural numbers that are less than 3".

Thus, the negation of the statement "all natural numbers are divisible by 3" can be made in two ways:

1) by adding the word "false" at the end of a given sentence;

2) by substituting common quantifiers for existence quantifiers and negating the word that follows the quantifier.

The phrase "not all natural numbers are divisible by 3" is not a negation of the phrase "all natural numbers are divisible by 3" because it is a false statement, like a given sentence.

8- example. Reject the statement "Some odd numbers are divisible by 4".

Solution. "Some odd numbers are divisible by 4." This is a lie. All odd numbers are not divisible by two, so they are not divisible by 4. Refutation: "Dividing some odd numbers by 4 is a lie." This is true in the sense that "all odd numbers are not divisible by 4".

Thus, the negation of the notion that "some odd numbers are divisible by 4" can be rejected in two ways:

1) by adding the word "is (is) a lie" at the end of a given sentence;

2) by replacing the quantifier of existence with the quantifier of generality and by replacing the sentence following the quantifier with its negation.

The denial of quantum (generality or existence) thought can be done in two different ways:

1) by adding the words "is a lie" at the end of the statement;

2) by replacing the quantifiers of generality with the quantifiers of generality and replacing the sentence following the quantifier with its negation.

This rule is enough to make a correct denial of quantum reasoning. The denial of a given consideration can also be made in another form. It is important to adhere to this requirement: if the statement is false, then its denial must be true, and vice versa.

RESULTS

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DISCUSSION

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