THE EQUIVALENCE RELATIONSHIP AND ITS IMPORTANCE IN THE CREATION OF GEOMETRIC FIGURES

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Annotation: The concepts of relation and equivalence in the course of algebra and their use in the construction, imagination of geometric figures are instructed, and geometry shows the intrinsic interdependence of some concepts of the sciences of algebra.

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The abstract and real understanding of the concept of relation, as well as the concept of equivalent relation, taught in the course of algebra in this article, plays an important role in imagining the structure of geometric figures.

Initially, our spatial (natural) conception of the composition of geometric figures develops when we give the idea of constructing (at least imaginary) elements of this set as geometric figures, giving the structure of the equivalence class as a set that forms the concept of equivalence. It makes sense to start this process with simple (simple) figures and gradually develop it into non-simple figures. This process is reflected in preschool education, in the assembly (construction) of various figures.

The latter is useful in teaching the course of school mathematics, in explaining, imagining, and expressing the structure of geometric figures. Finally, in higher education, it is useful for drawing graphs of functions, correctly representing and understanding sections of geometric figures. Specialists working in the above-mentioned educational institutions must have a good grasp of the theoretical foundations of the above issues. In order to further strengthen the skills of these colleagues, we cite the theoretical and methodological basis of the above issues.

Now we present the process of fragmentation (construction of a spread) of any non-empty set X.

Let us take the family of parts $\{D_a: aeA\}$, which consists of different part sets of the set X.

Definition. The family of parts D of a set X is called the distribution of parts X if the family D satisfies the following two conditions: a) Each element of D is not empty and the two arbitrary elements do not have common elements, ie $D_\propto \neq 0$, for $D_\propto \in D$ and $\forall \propto_1 \in A, \propto_2 \in A \; D_{(\propto_1)} \cap D_{(\propto_2)} = \emptyset$. b) If the combination of family elements D consists of a set X, that is, $\bigcup_{(\propto eA)} D_a = X$. [1]

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You will need to understand set A here as a set of shapes, a set of indices, and D_∝s as parts of X (figure). It is necessary to explain why the set of indices A is finite. Because in constructive matters, if the visual equipment (materials) is not limited, we cannot finish seeing the figure.

Now we give the concept of the relation of algebra, which is widely used in mathematics:

Let us be given a non-empty X set. Let $X^2 = X * X$ be the self-multiplication of X. It is known that the elements of X^2 consist of a set $\{(x, y): x \in X, y \in X\}$, and X^2 consists of pairs of sets (x, y). Since X is not empty, the X * X set is also not empty. Of course, if X is a finite set, then X^2 is also finite, if X is an infinite set, then X * X is an infinite set. So when we say an element of X * X, we mean a pair (x, u), or a set X^2 is a combination of a pair of elements of X.

For example, if we say that set X is a set of pencils of different colors, then set X2 is made up of a pair of pencils (two pencils).

Definition. The Δ relation in X is called the arbitrary non-empty $\Delta \subseteq X \cdot X$ set of X^2. It turns out that the relation Δ in set X is a different circle, since we have taken an arbitrary part set of X^2 as Δ. Let us now consider asosida on the basis of the example given above. If the pencils in the example are of different colors, or two different colors, the Δ set can also be thought of as a pair of two-color pencils, and so on. In this example, a pair of the same color, a pair of different colors, some or all of them can be Δ. Therefore, the Δ relationship is divided into the following types. [2]

Definition. The Δ relation in the set X is called: a) a reflexive relation if (x, x) uchun for an arbitrary $x \in X$; b) is called a symmetric relation if $(y, x) \in \Delta$ for an arbitrary $(x, y) \in \Delta$; c) is called a transitive relation if $(x, y) \in \Delta$ and $(x, z) \in \Delta$ for $(y, z) \in \Delta$; It turns out that not all attitudes are reflexively symmetrical and transitive.

Definition. The Δ relation in set X is called the equivalence or equivalence relation, where Δ the relation is simultaneously reflexively symmetric, and if it is transitive, and the equivalence relation is defined as ~. The set of mutually equivalent elements of the set X together is denoted by X \ ~ and X \ ~ is called the equivalence class of X. $X \setminus \sim = \{[x]: y \in X, x \sim y\}$. This constitutes the distribution of class X \ ~ X, and conversely, each distribution of X establishes an equivalence relation at X. All the pairs of pencils that take the above example form a symmetric (only different) relationship of equivalence relations of different colors.

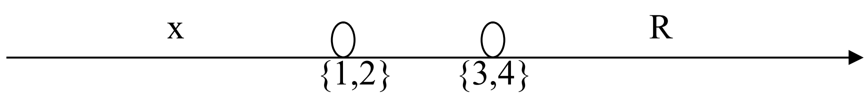
This is illustrated by the following example, which confirms that the application of the operative equivalence relation to non-intersecting (non-common parts) sections above is very important in the creation of geometric figures.

For example. Let us take any straight line R in the plane. Let R be a set of real numbers on a straight line. Let's take the numbers 1, 2, 3 and 4 in a straight line R (Figure 1)

Now let us enter the following relation D using these 4 numbers

a) In the set R = {1,2,3,4}, let each x∈ R = {1,2,3,4} points (x number) be a single {x} set.

b) Assume that the set {1,2} is a single set X_1 , and the remaining set {3,4} is X_2, that is, X_1 = {1,2} and X_2 = {3,4} in this case R are the points of the straight line: R = { {x}: x∈ {1,2,3,4} ∪X_1 ∪X_2} consists of a fragment written in the form. The splitting equivalence is now threefold: since the points X_1 belong to one class, the points of X2 belong to the second class, and the remaining points of R consist of one of the form {x}. We have to describe the numbers 3 and 4 as a single point. In that case, the image will be a geometric figure in Figure 2. Figure 2.



that is, we took {1,2} as a single point and {3,4} as a single point. The geometric figure in the image consists of a circular straight line. Examples like the above can be seen in the literature [3] and [4].

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