# MAKING IMAGES-PROJECTIONS IN DRAWING GEOMETRY

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**Abstract:** In connection with the introduction of information and computer technologies into the field of education, as well as in all other fields, it is necessary that the specialists trained in higher education institutions have communicative qualities. For this, great attention is paid to the organization of related subjects on the basis of integrative teaching. In particular, subjects such as "Drawing geometry and computer graphics" or "Engineering and computer graphics" were included in the educational programs of the educational process by the state standard.

**Keywords:** computer technologies, parallel projection, geometric figures.

This puts the issue of developing new integrated educational literature and providing them with the responsibility of professors and teachers with great experience and scientific potential in these subjects. This textbook is designed to increase the educational and educational activity of students, to make them listen, understand, respect the opinion of others, consider the interests of others, sense, feel, self-control, think and aimed at forming an independent, concise, thorough and accurate statement of conclusions. Also, new educational literature helps to inculcate in the minds and hearts of students-specialists a healthy ideology such as a free and prosperous homeland and a free and prosperous life, which are the noble ideals of our society, to themselves and others, to society, It also includes the duty of patriotism to know one's identity towards the state, nature and the general humanity.

The science of drawing geometry is one of the general engineering disciplines, in which the methods and rules of making three-dimensional geometric figures (point, straight line, plane, surfaces) and mainly two-dimensional projections of objects on the plane are studied. That is, drawing geometry is a bridge tool between three-dimensional space and two-dimensional plane, and its main purpose is to teach the following1:

It teaches two-dimensional projections of three-dimensional geometric figures and objects in space, i.e., the methods, rules and order of drawing their drawings.

Based on the two-dimensional images of geometric figures and objects on a plane, it teaches the methods, rules and order of mentally imagining their features in a three-dimensional space, that is, reading their drawings.

It teaches to solve positional and metrical problems related to their intersection and arrangement in graphic ways based on the plane images of geometric figures and objects.

Drawing geometry develops students' spatial imagination and logical thinking, which are necessary for mastering practical sciences and engineering activities.

The words "projection", "image" and "image" are derived from the French words "projeter" and "projection", which literally means: "to draw the opposite", "to depict", "to throw forward".

The science of drawing geometry, like other sciences, has its own history. The buds of this science have developed as a result of human practical activity, that is, from the period of construction of houses, temples, defense fortifications and water structures, as well as the production of various tools, ships and household items.

Now, based on the projection of the point A on the plane Q, it is possible to make the projection of the section AB or the triangle ABC or any object on the plane Q. To do this, the projections of points B and C are first found, and then, by connecting them together, a projection of



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the given section or triangle is made. In Figure 1, because the bundle of projecting rays emanates from one center, point C, this process of projection is called the central projection method.

If the center of projection is at infinity in a direction s, the bundle of projecting rays will remain parallel to each other. Such a projection process is called a parallel projection method, Fig. 2.

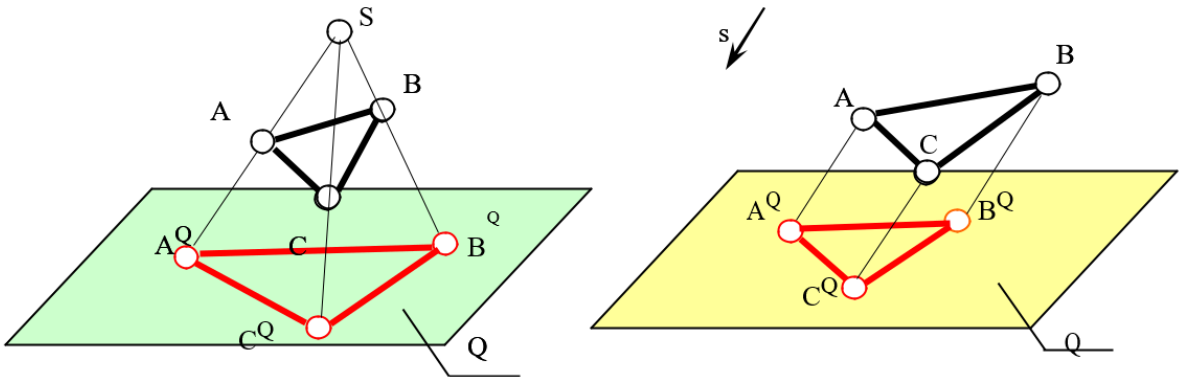
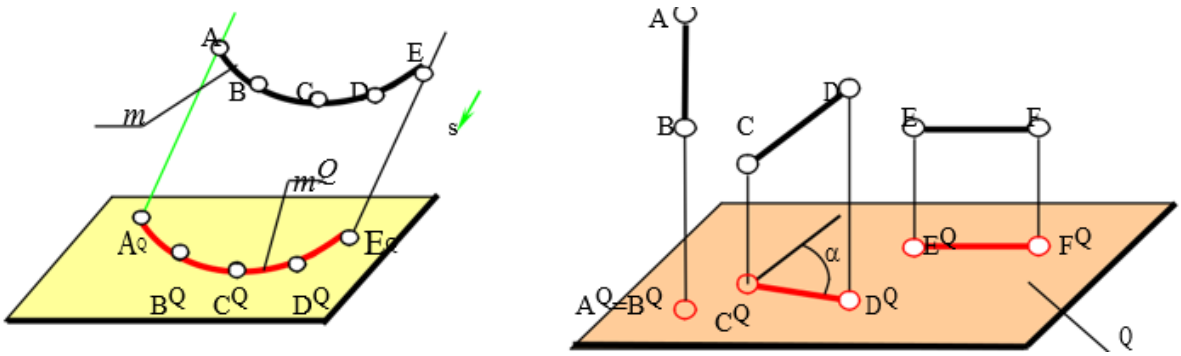



Figure 2 shows how to make a parallel projection of curve m. For this, points A, B, C and D lying on the curve are selected. of these points

In order to make projections on the Q plane, projecting rays parallel to the s direction are passed through them.

Find the points $A^Q$, $B^Q$, $C^Q$ and $D^Q$ where these rays intersect the plane Q. The found points are connected with a smooth line and a parallel projection of the curve m on the plane Q is formed.

In the parallel projection method, depending on the angle between the s direction and the plane of the projections, the parallel projections are oblique and right-angled. If the angle is acute, parallel projections with oblique angles are formed in the image and the s direction is shown in the drawing (Figure 3).




If the angle is right, right-orthogonal parallel projections are formed on the image. The drawing does not show the direction s (Fig. 4). In right-angled parallel projections, the linear dimensions of geometric figures and objects, according to their location relative to the projection plane, are connected by a simple mathematical expression $[A^QB^Q]=[AB]\bullet\cos\alpha$ That is, the value of the cross-sectional image is in the range of the size of this cross-section from point to zero. If = 90°, AB is described as a point of intersection. If $\alpha = 0°$, the section AB is depicted in its true size. If $0<\alpha°<90°$, the section AB is depicted smaller than its actual size. The property of cross-section projection in such a relationship applies only to right-angled parallel projections, which shows its advantage over other projection methods. Therefore, that is, because it is easy and convenient to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determine the linear dimensions in the image, the projections and views performed in the science of drawing geometry and mechanical engineering drawing are performed and created on the basis of right-angled parallel projections.

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