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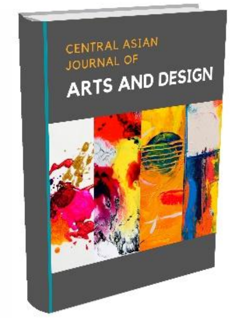

The Role of Creative Issues in Developing Students 'Design Ability

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Abstract
This article discusses the role of creative issues in the development of design skills in students. The article describes the importance, purpose, content, advantages of teaching for students of higher education institutions to develop design skills through creative issues.

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When new surfaces are invented or in the process of improving existing ones, the answer is two or more, i.e., very different, then that is the problem *creative issue* is When a student encounters so many different solutions in the design process, he chooses the most optimal option, taking into account the conditions of economic problems in the technical, technological solution, using his highest level - creative activity. Then they achieve their goal through various graphic images.

If a useful change is to be made to the surface, then the condition of the change to be made to the surface shall be given in writing and a new drawing of the surface shall be drawn through it.

At the present stage, the design, calculation and installation of construction envelopes and various technical forms are carried out taking into account advanced technologies and using computer technology. This places a number of demands on the methods of designing and defining surfaces, some of which are related in one way or another to geometric studies.

The method must be constructive, i.e. it must be able to describe the surface and demonstrate the technique of constructing any points and lines on it. The surface must be mathematically described using equations that allow the computer to perform appropriate calculations. The simpler the constructive and analytical method of surface detection, the easier it is to solve a variety of technical problems.

The practice of architectural design has a great deal of experience in the use of simple surfaces of spheres, cylinders, cones, revolutionary surfaces in various architectural forms. The geometric

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properties of these surfaces are taken into account from the earliest design stages because they are well studied and easy to imagine. With the introduction of thin-walled shell constructions, simple surfaces have easily moved into shell design practice. However, these surfaces did not meet the requirements for shell structures and their plastic shape. Architects have therefore turned to complex second-order surfaces such as hyperbolic paraboloids and single-leaf hyperboloids. Curves made from these surfaces have load-bearing properties because they are double-layer curved surfaces. They consist of two dashed lines, which are useful in drawing, designing and manufacturing fittings and molds. The cross-sections and visible contours of these surfaces are second-order curves. They are easy to build, beautiful and plastic, allowing the contours of the curves to be given dynamically or statically, making them symmetrical or asymmetrical, flexibly controlling the proportions of the structure.

However, all their features are never used in the design of curves, and the possibilities of new shapes have not yet been fully explored.

Other algebraic surfaces are less commonly used in practice.

If an engineer presents a complex surface model to an architect, then as soon as the architect sees the shape, he can highlight a large number of parts bounded by different contours on it and arrange them to create a new interesting architecture .

But it is not enough just to have a visual impression, it is necessary to know the geometric properties of the surface and the law of its formation.

The process of designing a curve is complex. In addition to architects, it will be attended by designers, accountants, heating system specialists, lighting, acoustics and others. Each of the experts makes their own decisions taking into account the shape of the curved surface. The work of the architect will be more successful, in addition to artistic and aesthetic, various design, computational, economic and technological aspects, he must take into account more requirements in the initial formation of the image. In presenting the material, the main attention is paid to the methods of constructing curves and surfaces on the basis of previously given geometric conditions, distinguishing lines from a series of sets. Only algebraic curves and surfaces are selected for consideration.

The second-order curve is arbitrarily located with respect to the coordinate axes and generally has the following equation:

$$Ax^2 + 2Bxy + Cy^2 + 2Dx + 2Ey + F = 0. \qquad (1)$$

The equation contains six constant coefficients. If all coefficients are increased or decreased proportionally, the line does not change; this means that there will be five independent coefficients, and the position and shape of the second-order curve are determined by the five parameters.

For example, five points in a plane, three of which do not lie in a single straight line, define a single curve of the second order. To write its equation, it is necessary to find the coefficients A, B, ...,.

It is known that a secondary curve can be drawn with five parameters, i.e., five points, five straight lines, or a combination of them, assuming that three points in the plane do not lie on a single straight line. . The number of such combinations is 12 (Figure 1).

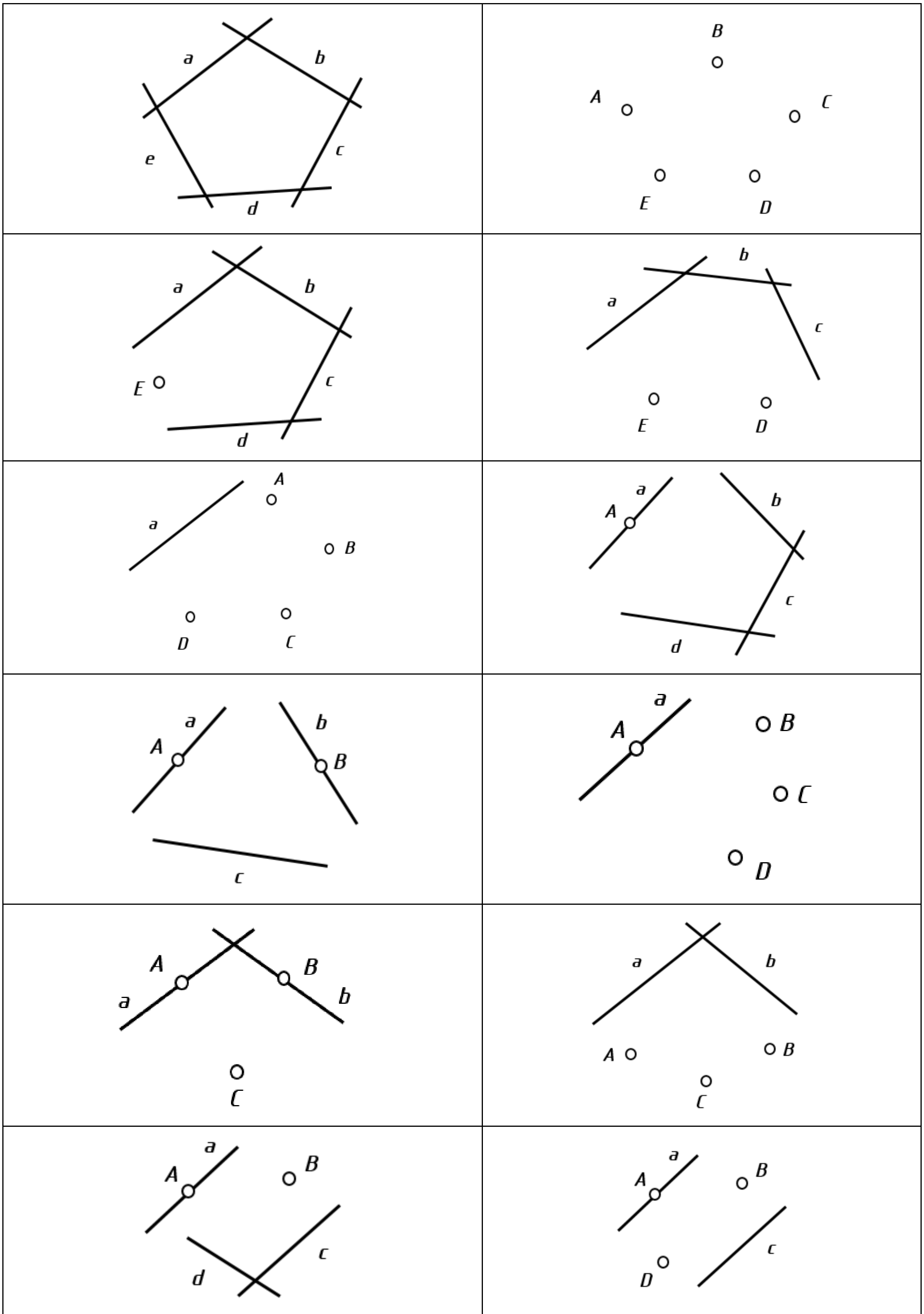

Figure 1

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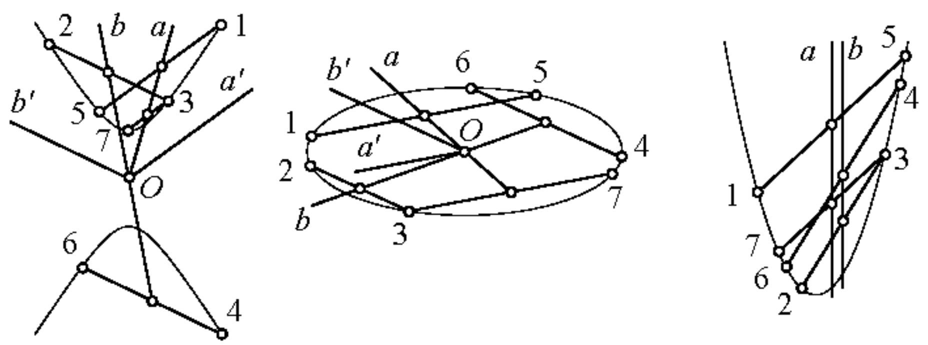
The plane shows five real points 1, 2, .., 5, one or two of which may not be relevant. It is required to construct the ends and asymptotes of a second-order curve passing through these five points.

The constructive solution of the problem is that the diameters of the second-order curve form an involution, its double lines defining its asymptotes, and the mutually perpendicular pair of straight lines representing the principal direction. Therefore, it is necessary to construct the involution of the diameters connected by the second-order curves required to solve the problem.

From the known points 1, 2, .., 5 we find two pairs of watts: 3 7 watts parallel to the known waters 1 5 and 4 6 watts parallel to the known 2 3 watts (Figure 2). Additional points 6 and 7 are determined according to the Pascal scheme. We draw the diameters a and b intersecting at the center O of the cone through the midpoints of the parallel waters. Each diameter together with the connected vatar forms a pair of connected lines. In the O ray given by two pairs of diameters *a* ~ *a '* and *b* ~ *b'* , we obtain an involution where a '|| 15, b' || 23.



a) **b)** **c)**

Figure 2

If the connected pairs *a, a '* and *b, b'* are separated, then the involution is elliptical and the required curve is an ellipse (Fig. 2, b). The inseparability of the pairs *a, a '* and *b, b'* allows the curve to be classified as a hyperbola (Fig. 2, a).

For the parabola (Fig. 2, c), all diameters are parallel (not connected by a straight line). The involution of the connected diameters of the parabola is degenerative and does not contain enough information to determine its dimensions. Note also that, unlike ellipses and hyperbolas, the five points of a parabola are related to some geometric relationship (due to an additional condition in the form of an inappropriate experiment line) and therefore cannot be defined freely. Therefore, the specialization of a “parabola with five points” is not considered an internal contradiction due to the excess of boundary conditions. Nevertheless, we will then consider performing a parabola for all acceptable combinations of its elements.

Thus, as a result of the first movement, not only the involution of the connected diameters but also the center of the cone was determined and its affine classification was given.

Developing creative skills in students through similar creative issues is now very important. Creative issues play a key role in developing students ’design skills. It forces students to think, reason, and explore.

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