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BENEFIT FROM THE GEOGEBRA PROGRAM IN SOLVING PROBLEMS OF PROJECTIVE GEOMETRY

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Annotation
This article presents methods of using information technology achievements in the conduct of the course “projective geometry”, which is passed to students studying in the mathematical direction of Higher Education. In particular, the possibilities of the “GeoGebra” program in visualizing three-dimensional shapes and performing various geometric actions on them are covered. GeoGebra can help solve complex projective geometry problems associated with perspective, duality, and homography by providing a dynamic visual representation of problem parameters. In addition, its convenient interface and presence on various platforms simplify the process of studying and applying the concepts of projective geometry. In general, GeoGebra is a valuable tool for students and researchers interested in projective geometry.

Keywords: projective geometry, GeoGebra program, three-dimensional figures, making cuts.

Introduction

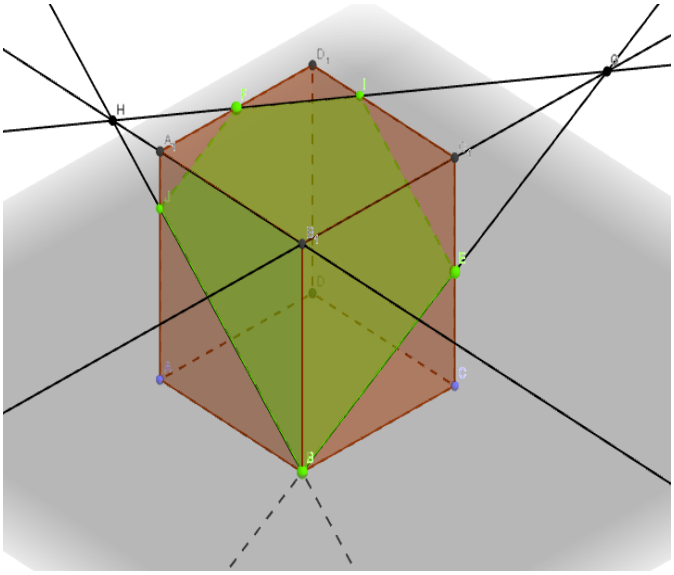
In the current period, education cannot be imagined without information technologies, which is why we all began to use the term "new pedagogical technologies". One example is that a personal computer has completely changed the possibilities of Education. The Internet has provided even greater opportunities for the implementation of new pedagogical technologies in the leptops educational system. Reform of the educational system in the conditions of independence of Uzbekistan is primarily associated with the implementation of advanced information technologies in the educational and educational system.

The curriculum of students of the second stage of pedagogical institutes and universities includes the subject of projective geometry. In this section of geometry, students learn to solve such issues as various projections of figures, methods of representation of spatial bodies in the picture plane, intersection points of spatial figures, cross-sections in polygons and circular bodies. In solving such issues, it is necessary to form the spatial imagination of students. GeoGebra computer software has the ability to make exactly three-dimensional images and show them visually, that is, to display the image in a circular fashion from all sides. Below we will solve some of the above issues in the GeoGebra program.

Issue 1. ABCDA1B1C1D1 make a cross section of the cube with the B end of the cube, CC1 and a1d1 the plane passing through the middle of the edges.

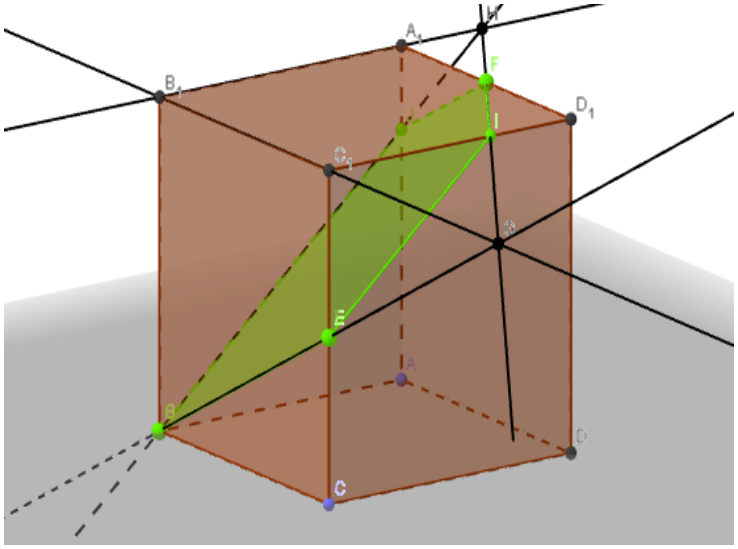
Solution: to solve this problem, we first draw an image of the cube and define the points given to US B, E, F. We continue the edge B1C1 and intersect BE in a straight line to form a point G. This nuqata lies in the plane of the upper base of the cube. Since point F is also in this plane, the straight line connecting them intersects with edge C1D1 and the continuation of edge a1d1 at points I and H, respectively. One

point I was found where the section we were trying to make was unknown. At the junction of point H with Point B, AA1 crosses the edge at point J. The result is a beifj cross-section Pentagon that we are looking for. The issue was resolved.(Draw 1



1-chizma

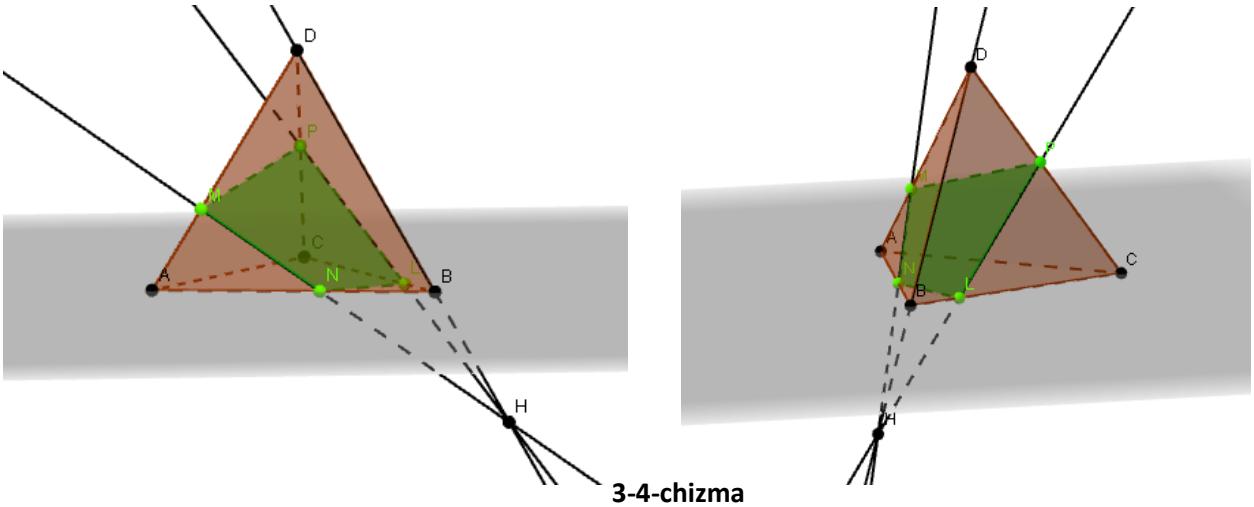
It looks from different sides of the drawing
It is necessary to show the drawing from different angles to students and teach them to independently solve similar issues using the program.(Drawing 2 gives a different view of the shape in drawing 1)



2-chizma

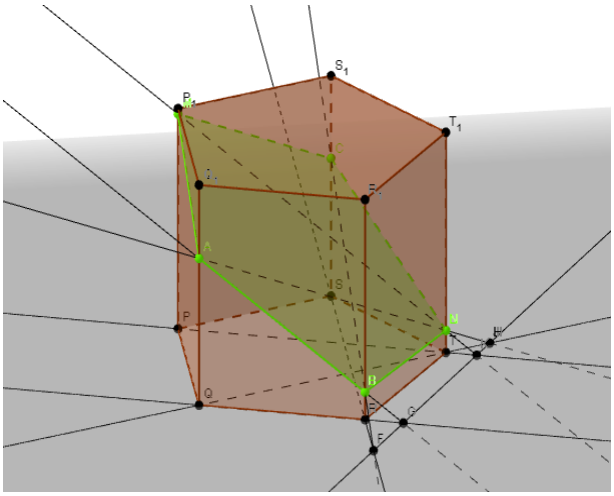
Issue 2. Make a cross section with the plane passed through the points M, N, P obtained by the edges of uningAD, AB, DC, respectively, with the DABC tetrahedron.

Solution: when solving this issue, it is also necessary to pass straight lines, as above. Continuing the DB edge, we intersect the MN with a straight line and form the point H. The point H is adjacent to a given point P, which means that the intersection of a straight line with the BC edge results in the point L that we are looking for. The MNPL would be a rectangular cross section.(Draw 3-43-Masala. On the side edges of the pentagonal prism PQRSTP1Q1R1S1T1,points a,B, C, are obtained as follows: QA:AQ1=2:1,



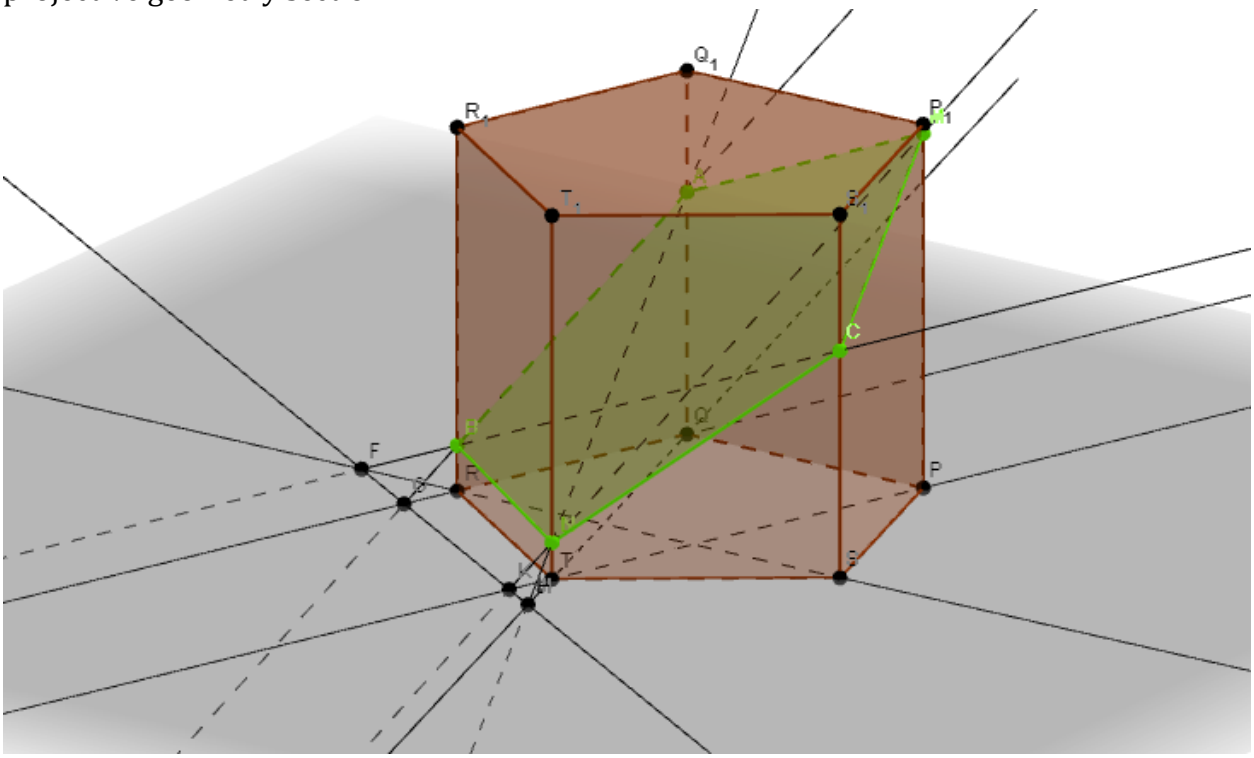
3-4-chizma

RB:BR1=1:7, SC:CS1=5:3. Make the section formed by the intersection of the ABC plane with the prism.
Solution: continue the QR edge by intersecting AB with a straight line and we get a point G. BC and SR pass straight lines to form point F. FG, QT and PT intersect straight lines to form points H and K. Ah run a straight line .
the result is a point N on the edge TT1. The KN straight line PP1 makes a point M on the edge. The ABNCM will be the cut we are looking for.(Draw 5-6)



5-chizma

In solving the above problems, projective geometry hoses, types of projection, were made the most efficient use. When geometry lessons are visually explained to students through a projector using the GeoGebra program in ways to solve the same issues as above, students become more aware of the projective geometry section.



6-chizma

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