THROUGH GEOGEBRA DIGITAL LEARNING SYSTEMS SOLVING PROBLEMS OF ANALYTICAL GEOMETRY

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ABSTRACT

GeoGebra allows you to visualize math, ie to do research and experiments on mathematical problems. In addition, parallel and perpendicular circuits are strictly observed when moving geometric drawings.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

GeoGebra is a mathematical application that combines geometry, algebra, and mathematical calculations with independent learning. With the help of the mouse, you can draw and change points, cuts, vectors, straight lines and cones, as well as many other functions. He was the winner of the special competition for this program in 2009. In August 2011, a three-dimensional version was released.

GeoGebra is a free, easy-to-use, cross-platform dynamic math program for all levels of learning. Once the geogebra is free, you can install it and use it on any computer. With each projector, each class has the opportunity to clearly explain math. Students will be able to see abstract concepts with their own eyes. This is especially useful when explaining a new topic. At the same time, the problem with mathematical formulas can be illustrated with visual graphs. This method is particularly interesting for students and brings formulas easily. With the help of geogebra, "lifeless" shapes and graphs are secured. That is, they are interactive. You can revive the forms. Increases computer literacy. On top of that, GeoGebra is the only free and only mathematical program in the Kazakh language.

The methodological approach to GeoGebra software can explain the reading material to varying degrees and increase their level of work from illustrative schemes to research schemes. Another feature is that students learn a great deal of material during the drawing process [1].

So, it introduces the movement using GeoGebra in teaching math. Sure, you can teach using the old method, but becoming a teacher with modern information technology is a requirement of the time.
You can view Geogebra as a workshop with tools and make animation drawings. You do not need to know the programming language to master this program. An example of solving a geometric problem in GeoGebra.

Example 1 the ends of a triangle are given. With GeoGebra:
1) Find the perimeter of the triangle;
2) Find the equations of the triangular sides;
3) the equation of media;
4) height equations;

5) Draw a straight line parallel to the crosswalk;
6) Find the radius of the inner circle.
Resolution:
1. To find the perimeter of a triangle, we do the following:
a) The ends of a triangle $A = (9, -5)$, $B = (-2, -3)$, $C = (5, 2)$
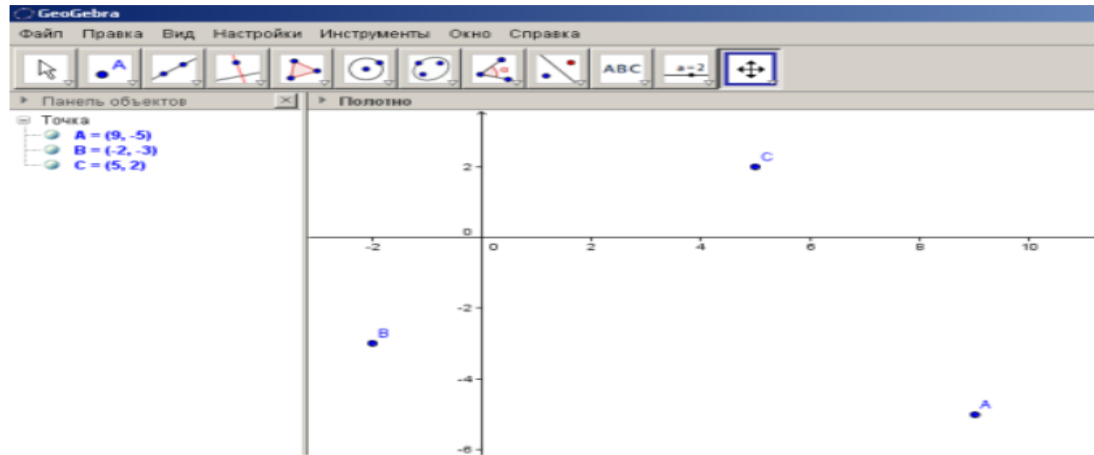Enter the formula using Enter.

Figure 1. Determination of triangular ends

b) Draw the sides of a triangle. To do this, select the right dashboard and cut the sides of the dash (Otrezok po dvum stem) from the toolbar..
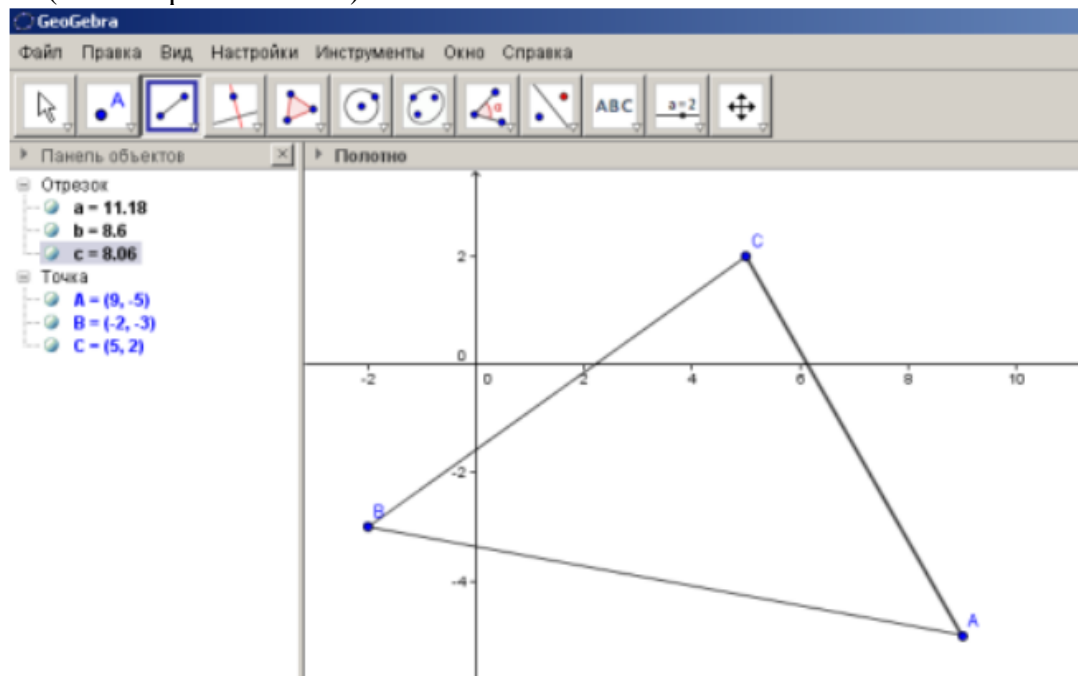
Figure 2. Drag triangle sides with three tips

Select a straight (Pryamaya po dvum tokkam) tool from two points on the right and the cut (Pryamye and otrezki) instruments to determine the equations lying on the sides. Draw the edges.
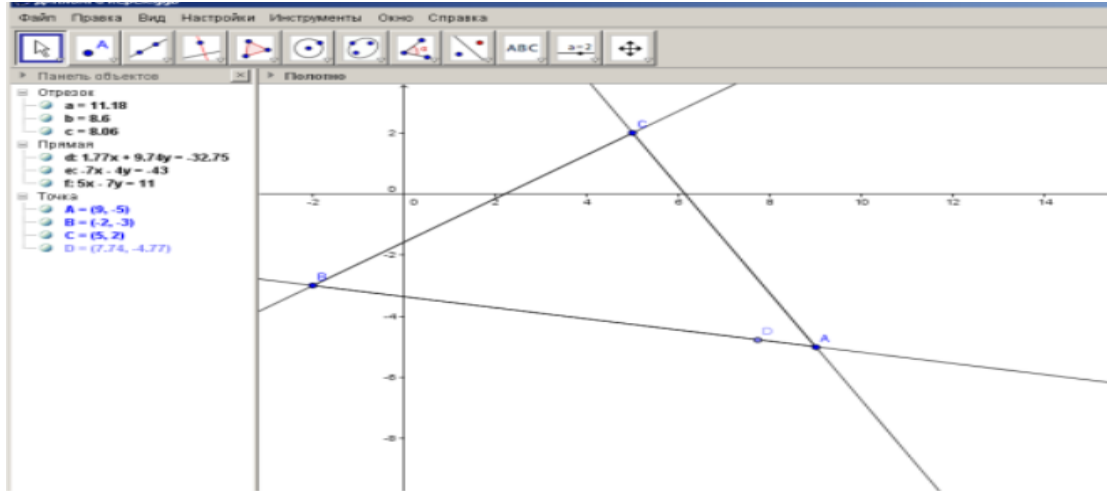

Figure 3. Move right across the three sides

The equations of the sides of a triangle

$$1.77x + 9.74y = -32.75$$

$$-7x - 4y = -43$$

$$5x - 7y = 11$$

To draw the median of the triangle, it is necessary to find the median sides of the median tariff. To do this, you need to find the middle or the center (Seredina or Center) of the dots and mark the center of each side. The dots in the picture are the middle of the triangle [2].
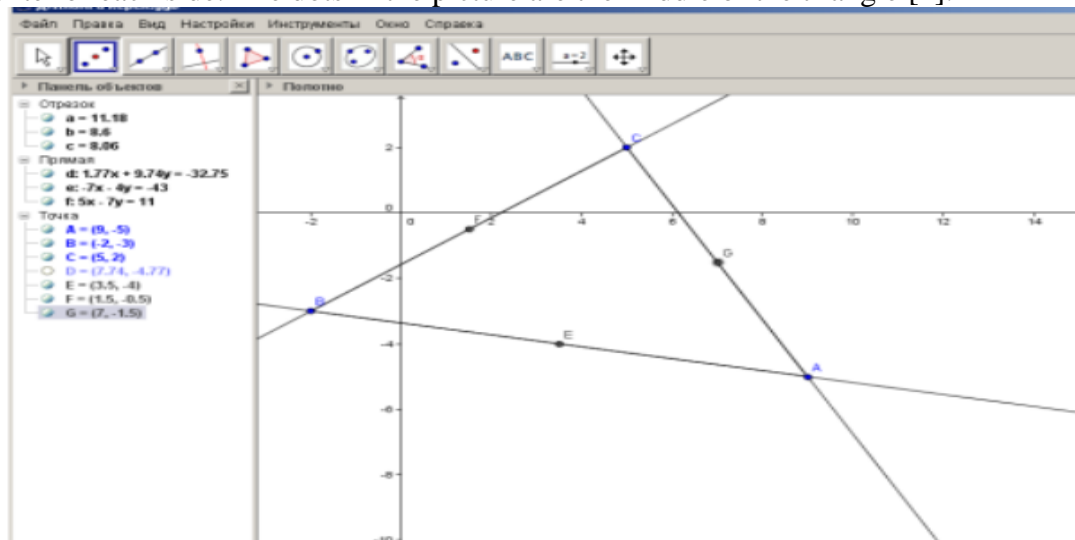

Figure 4. Find the middle of the parties

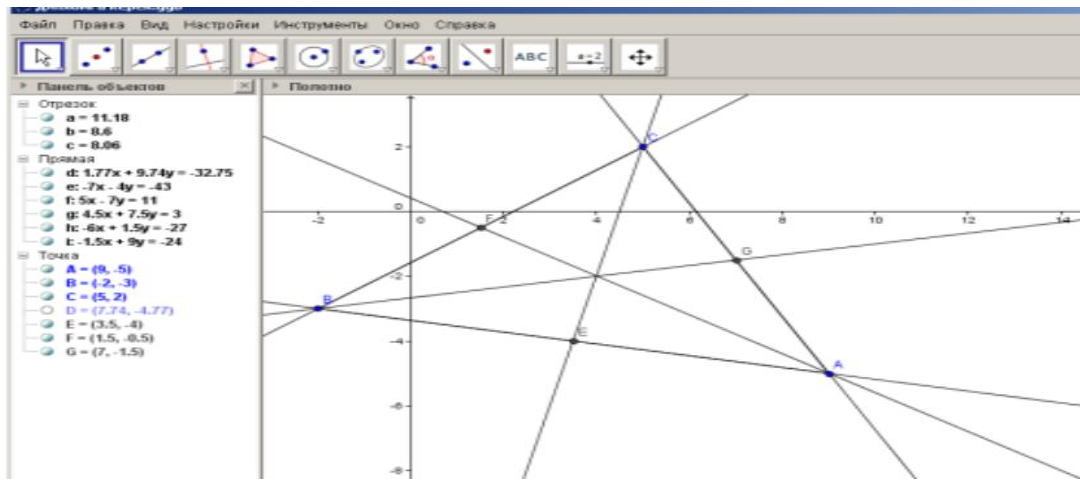Find the equation by placing the ends of the triangle with the middle of the opposite side.

Figure 5. Running triangle medians

The equations of the triangles median

$$4.5x + 7.5y = 3$$

$$-6x + 1.5y = -27$$

$$-1.5x + 9y = -24$$

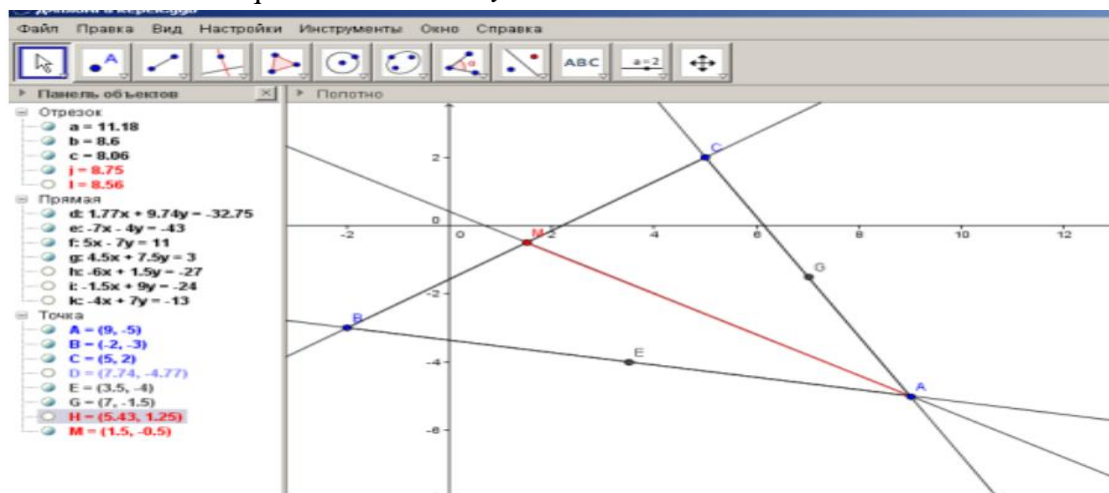*AM* the median equation $4.5x + 7.5y = 3$ there will be.

Figure 6. Searched *AM* the media bed is right

BH to adjust the height *B* move perpendicular to the opposite side of the tip. Do it *B* point and the opposite side and draw the correct perpendicular tool.

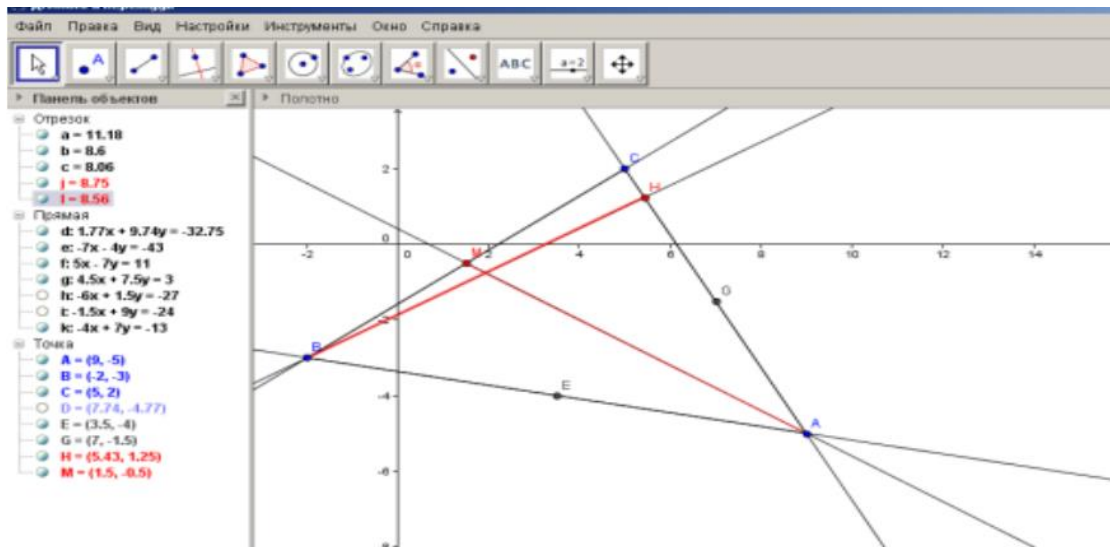*BH* height equation: $-4x + 7y = -13$

Figure 7. *BH* the height of the bed

A through the tip *BC* parallel to the other side. Then the correct parallel equation $-5x + 7y = -80$.
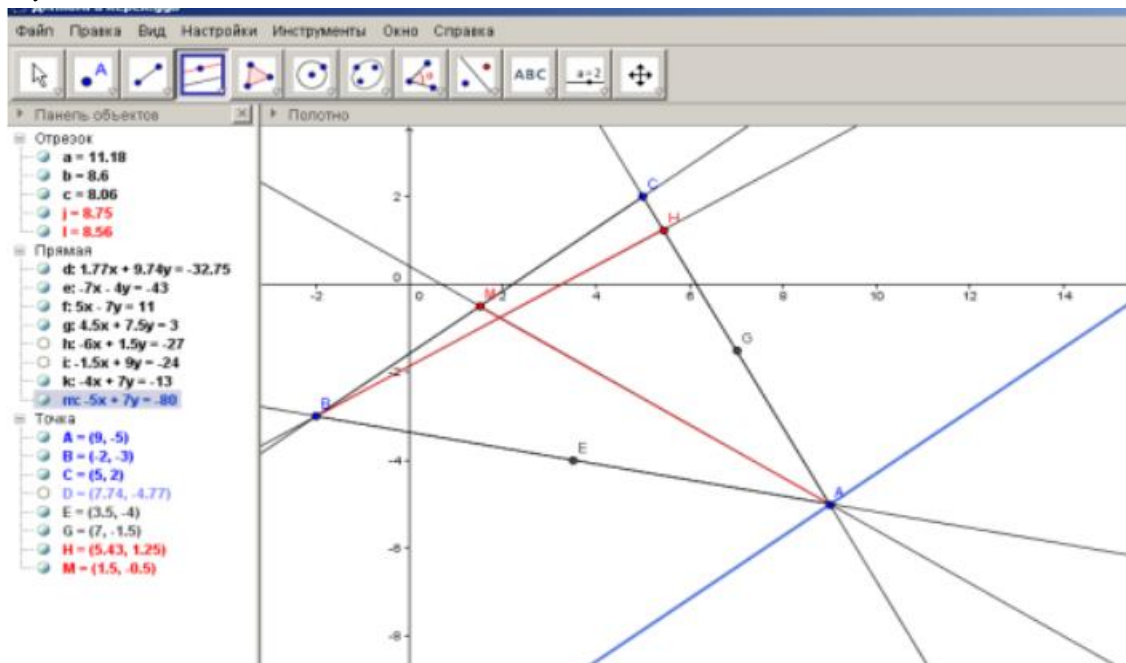

Figure 8. *BC* directly parallel to the

We now rely on the tariff to draw the inner circle in this triangle. The rate is at the intersection point of the center bisectra of the inner circle in the triangle.

Therefore, using the Bissektris instrument, we find the bissectors of both corners and find the intersection point. Figure 9 shows bissectris.
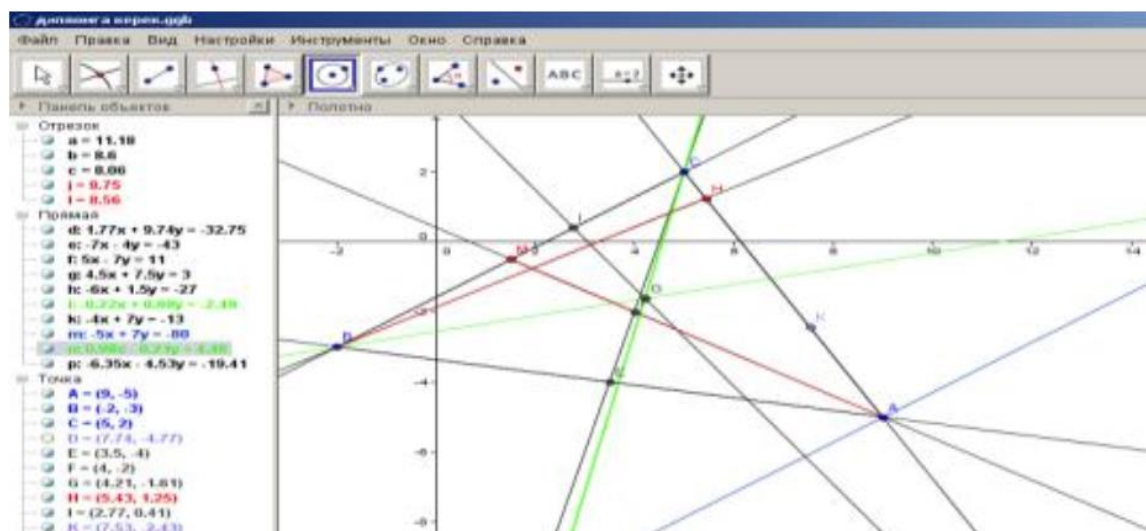
Figure 9. Bissectris of a triangle

Now, to find the point where the circle lies near the triangle, lower the perpendicular to one side of the triangle. Using these two points, use a circle drawing center and a point, and draw a circle as in Figure 10. [3].
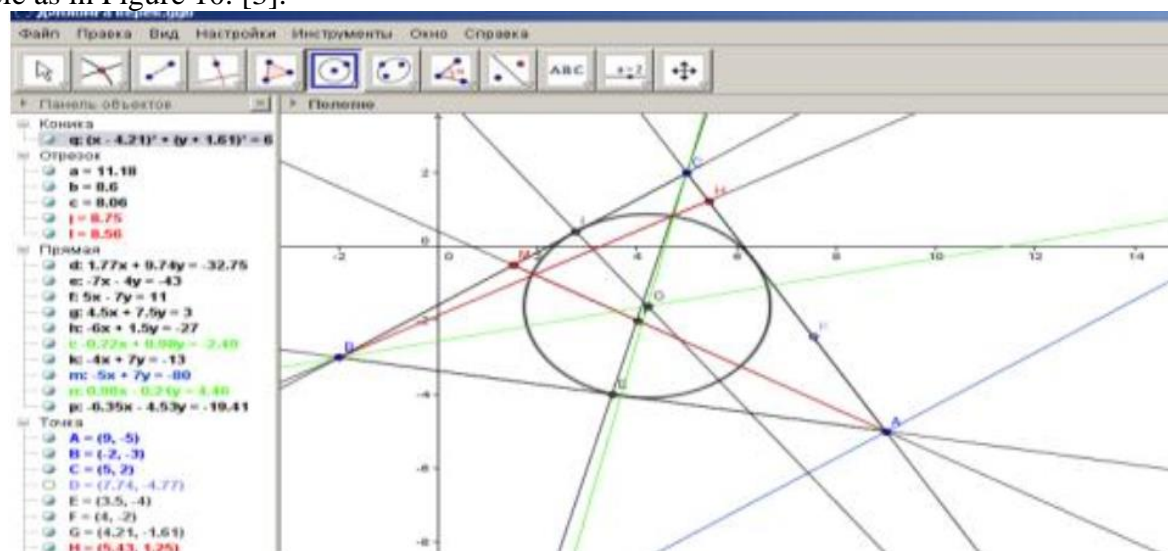

Figure 10. Circle inset with triangle

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2. Larin S.V. Animatedno-geometric methods in algebra. The material of the VI Verosionalskoye Methodical Conference on Mejdunarodnym precision: "Information Technology in Mathematics and Mathematics" in frame VI Mejdunarodnogo Nauchno-obrazovatelnogo forum "Человек, семья и развесться.

3. www.geogebra.com