**Geometry tool**

An ultimate guide to a universe of geometric magic

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1. Introduction.

*Geometry tool* is a written in C++ project that executes the following operation:

1) Checks whether a particular point lies on a given line.

2) Finds a line paralel to another through a given point.

3) Finds a line perpendicular to another in a particular point.

4) Finds the intersection point of two lines.

5) Finds the equations of the heights, medians and bisectors of a triangle.

6) Finds the equation(s) of the tangent line(s) to a parabola through a given point.

7) Finds the intersection points of a line and a parabola.

8) Determines the kind of the quadrangle that 4 lines form .

1. Some particular characteristics.

* the equations of the lines, forming the triangle, should be entered in a particular order (AB, BC, CD, AD); otherwise, the program may not perform some of the expected operations correctly;
* all of the lines need to be presented with their widely accepted equations (a\*x + b\*y + c = 0) in the user’s input; in the output, however, the “y = k\*x + n”- form of lines will be visualized (for esthetic reasons);
* due to the use of the round()- function, some of the results may be relatively correct (with small and insignificant difference).

1. Main aim of this project.

* Key idea: *Geometry tool*, when used correctly, is a powerful tool that helps solving numerous problems related to analytical geometry;
* This project is also believed to have enhanced the learning process of many FMI – students – a benefit that may even expand the use of such programs in the future.

1. Conclusion.

* Why?

I have chosen this project because, quite frankly, I enjoy solving geometric problems (and coding tediously long programs as well);

* I hope you find this project interesting and effective in executing all of the operations needed. Also, I will appreciate some feedback for future improvement.

**Thank you for your attention and personal time!**