

Geoplan-Geospace, a geometrical software

Geoplan-Geospace is a software for mathematical constructions that allows dynamic and interactive representations. This new release has appreciably increased :

- its mathematical power ; for instance, one can create figures illustrating problems of numerical analysis ; provide spacial representations of graphs of two-variable functions, or of other more complex surfaces; 2D-figures and 3D-figures can interact with one another.
- the flexibility of its interface : **not only can the software display instantaneously the whole interface (the menus, the on-line help) in English, German or French , but it can also instantaneously translate the mathematical texts of the figures !**

How to use the software

The first construction

Open Geoplan-Geospace

Choose Options → Language → English

File → New Geoplan Figure

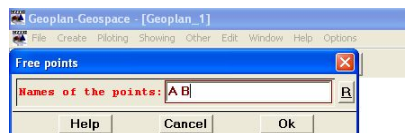
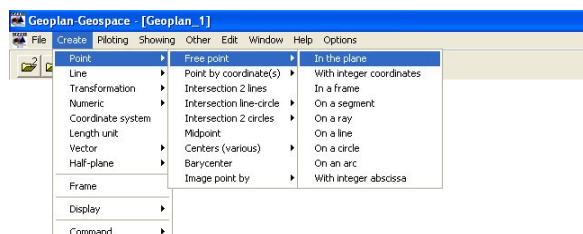
The goal of our today's work is to illustrate the following problem :

ABC is a right-angled triangle in A. M is a point of the hypotenuse. Let ANMP be the rectangle with N on the side [AB] and P on the side [AC].

What is the position of M such that the area of ANMP will be the smallest.

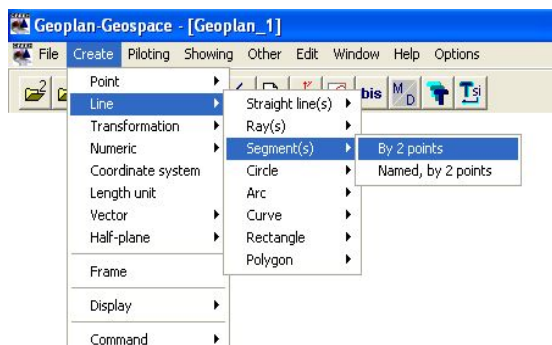
Construction of the figure

The right-angled triangle:



You can change the position of the points A and B by dragging the points using the left button of the mouse.

We need now to draw the segment [AB].



In the field “name of the segments” you have to write AB

We have now to determine the construction of the point C, so that the angle BAC is right. We construct the perpendicular line to the line (AB):

Create → Line → Straight line → perpendicular

And we fill in the field : Line Through: A, and perpendicular to: AB, Name of the line: s1 (you can choose the name, with at the most one letter and one digit)

You can now choose a point on this line:

Create → point → free point → on a line

Name of the line: s1 (or the name you just gave to this line)

Name of the point: C

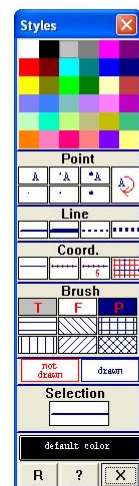
You see that it's not very easy to move the point C. We are going to enlarge the mark of the point.



You can also in this window change the color, the thickness, the aspect of the different object. For example, we don't need the drawing of the line s1 ; then using the menu “not drawn” of this window we can rub the line out.

You can also change the color of the segment [AB]...

Close this window by clicking on a cross (at the top right or at the bottom right)



We can now construct the sides of the triangle:

Create → Line → Segment → by two points...

Note: When you have to do several times the same construction you can use the “bis” button on the toolbar.

We have to construct the point M on the hypotenuse, the points N and P (do it yourself...)

Now we have to construct the rectangle APMN :

Create → Line → rectangle → by a diagonal: and write a diagonal of the rectangle.

At last we have to display the area of this rectangle ; the computer can't do that directly but you can use the menu Create → Numeric to find yourself a way to calculate this area.

Finally, you can display the result using Create → Display → Existing numeric variable.