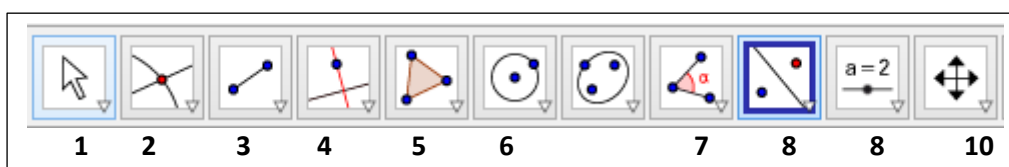




## GeoGebra Tutorial 1

This is a tutorial for those who never had worked with GeoGebra or feel like beginners. We will explain the main features of this fantastic software and give you some tasks to train important details.

### 1. Construction menu



**Task:** You only need to get familiar with some points in the menu. Try out the following construction tools, the difference between similar ones and test the movability of points, lines,...

- 1: Move
- 2: Point - Point on Object – Attach/detach Point – Intersect – Midpoint or Centre
- 3: Line – Segment – Segment with a Given Length
- 4: Perpendicular Line – Parallel Line –Perpendicular bisector
- 5: Polygon – Regular Polygon
- 6: Circle with Centre through Point – Circle with Centre and Radius – Semicircle through 2 Points – Circular Arc
- 7: Angle with Given Size
- 8: Reflect object in Line – Reflect Object in Point
- 9: Image
- 10: Move Graphics View

### 2. Main menu of GeoGebra



**File:** Use *New Window* seldom. It makes the program more slowly. *Save (as)* your files on your stick AND in the folder that we have announced with the name we have proposed for each task. For *Share* you need to have an GeoGebra account on the internet.

**View:** Algebra and Graphics should be switched on.

**The most important tools:** on top right on the screen button to go one or more steps back/forward



**Task:** Make clear that you can work with these options.

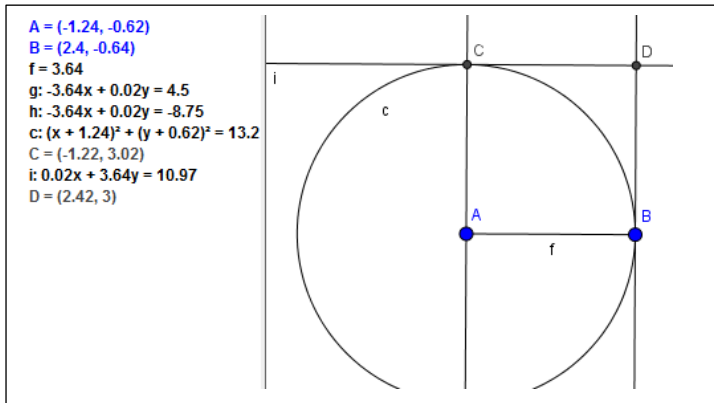
### 3. Difference between construction on paper with compass and ruler and with GeoGebra

**Task:** Think about this difference. Construct now a square in the way you are used to do it on paper with compass and ruler.

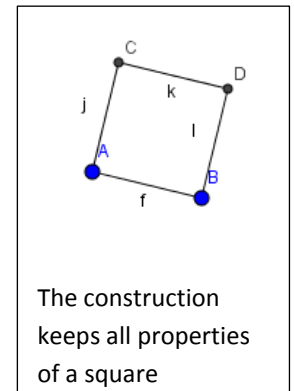


## GeoGebra Tutorial 2

**Task:** Try to move your square by dragging the basic object. Does the square remain a square?  
Compare your construction with the construction below. Did you do it in a similar way?



1. Segment AB
2. Perpendicular line through A
3. Circle with centre A and point B to get the same height
4. Intersection point= C
5. Line parallel to AC in B
6. Line parallel to AB through C = D



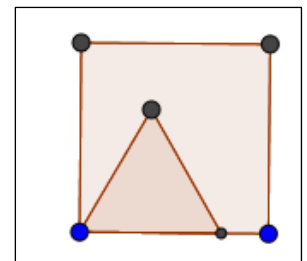
### 4. Dynamic constructions

In the last task you have seen that the form of a square does not depend on the length of the sides. You don't need any measuring you only work with a segment whose length is not important. This we call dynamic construction. There is only one segment whose length can be changed and all the others are related to it e.g.  $\frac{1}{2}$ ,  $\frac{3}{4}$ , ...

Example: The length of the triangle should be  $\frac{3}{4}$  of the length of the square.

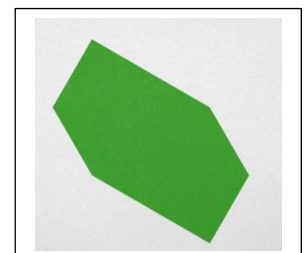
So it works:

1. Construct a polygon with 4 corners (vertices) by constructing two points. The length between these points A and B is not important.
2. Chose a circle with midpoint und given length, click on A and type  $AB/3*4$ . Then a circle with  $3/4^{\text{th}}$  of the length of AB is drawn.
3. Intersect circle with segment AB. 4. Construct a regular polygon with 3 vertices.



**Tasks:** 1. What about the meaning of the points marked in blue colour?  
Now construct yourself! How can you move and magnify the construction?  
2. Try to construct the green area. If you like to see the steps of construction and all details of it have a look at:

<https://www.geogebra.org/m/Q8m5uY5h>



### 5. Coloured lines and areas, hiding objects (be careful with deleting!)

All lines, polygons and circles can be coloured. You can change thickness and style, intensity (opacity) of colours of lines and areas by ight mouse click on the object whose properties you would like to change. With right mouse click you can hide and show (again) objects and labels. Sometimes it is easier to do this in the left algebra window where the objects are listed. By move and right mouseclick you can hide all labels if you have marked the whole construction before.

**Task:** Try to get familiar with the object properties!