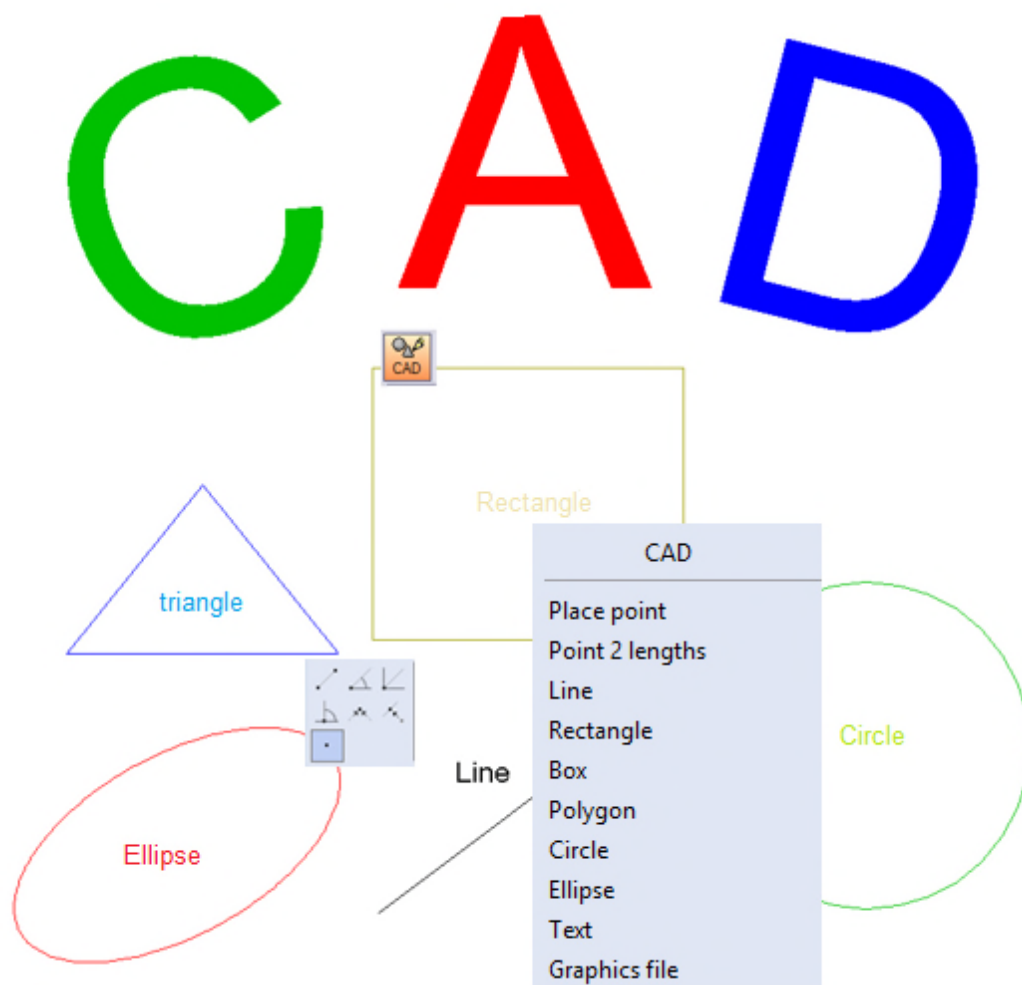

CAD Basics



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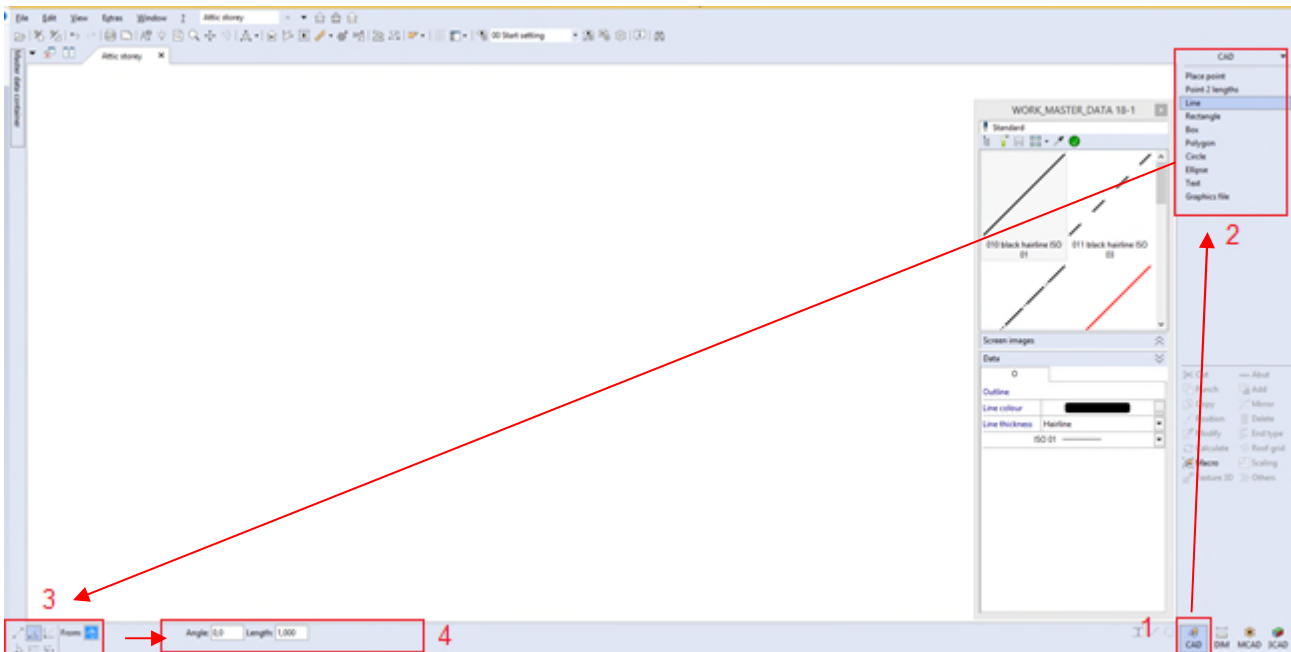
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CAD Basics

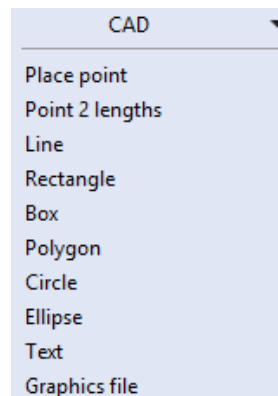
1. Standard procedure to create CAD components



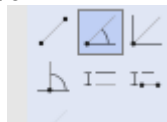
1. Select CAD:



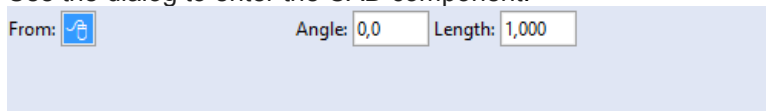
2. Select the desired command:




3. Select an additional option:



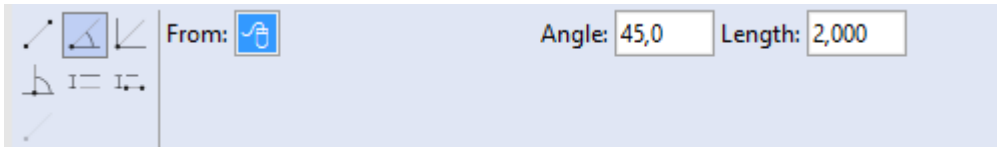
4. Use the dialog to enter the CAD component:




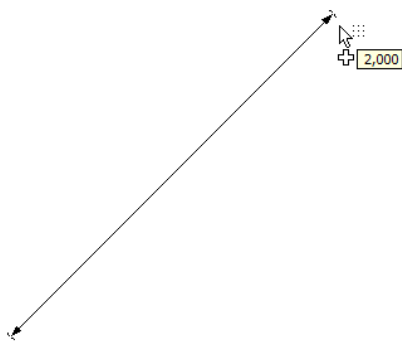
2. Input of lines

Select  and choose the command **Line**.

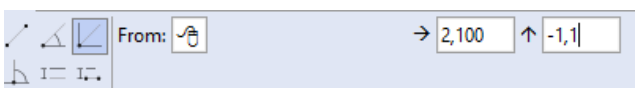
2.1. Additional Option 2: Define component by startpoint angle and length




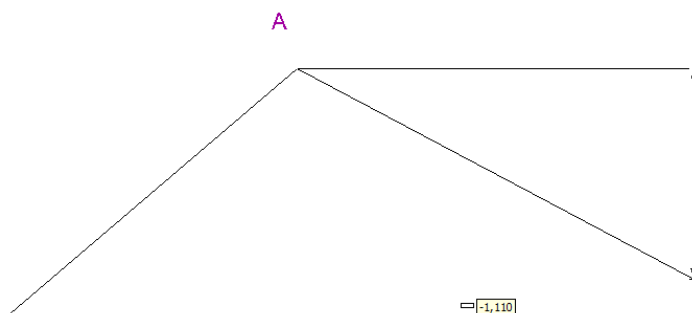
- Select any Startpoint with a left mouse click 
- Select the desired angle
- Select the desired length



2.2. Additional Option 3: Define component with Startpoint and X/Y measurement



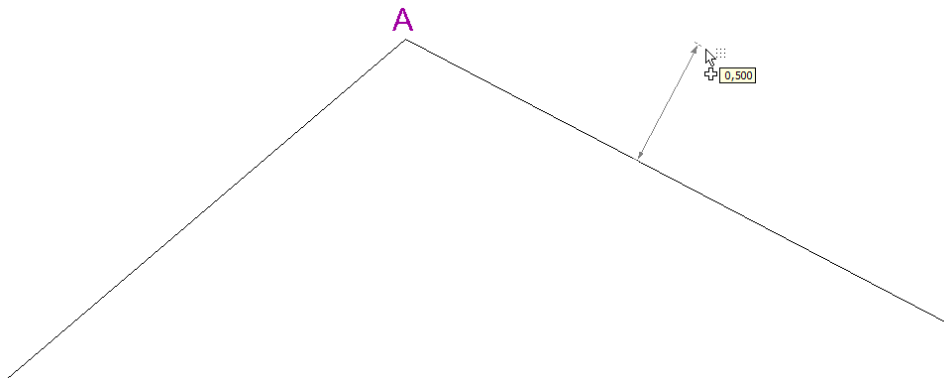
- Select the endpoint off the line which you have created 
- Select the horizontal length
- Select the vertical length



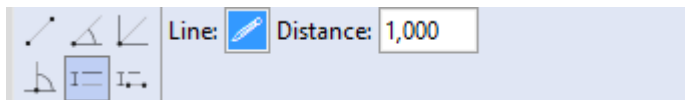
2.3. Additional option 4: Define component at right angle to a reference line



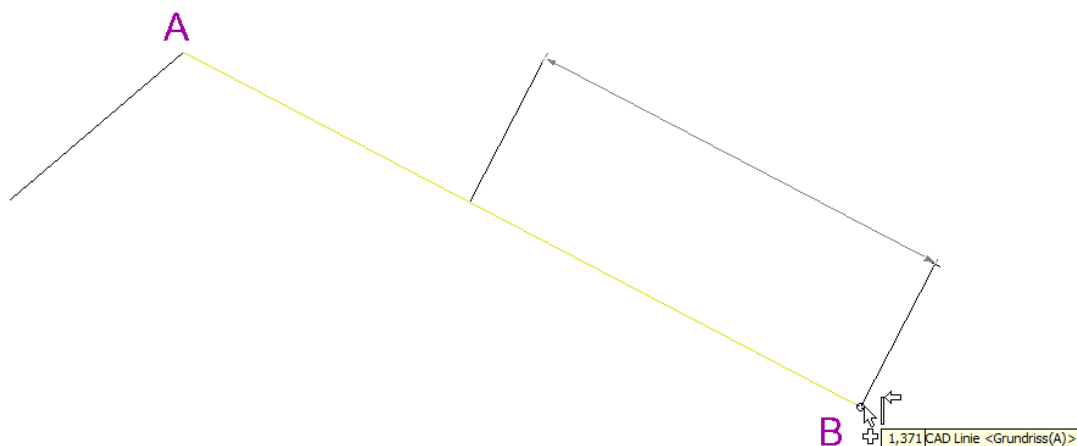
- Select reference line Line:
- Select the distance to the reference point A Distance: 1,000
- Select the line length Length: 0,500



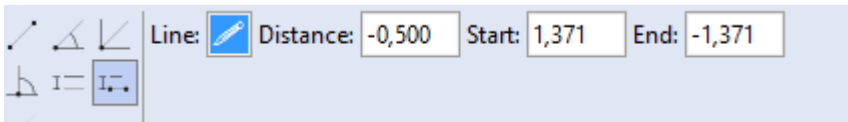
2.4. Additional option 5: Define component parallel, with same length to a reference line




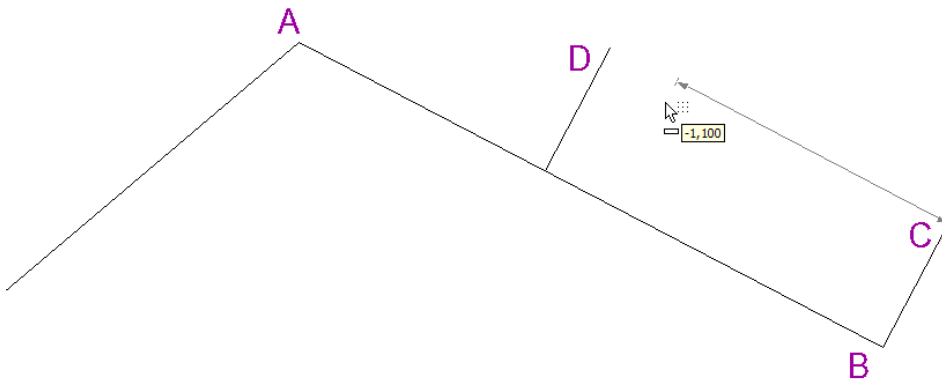
- Select the last drawn line for the reference line Line:
- Use the mouse to select the distance. Select point B with the left mouse button
- (Also you can use the input field)



2.5. Additional option 6: Define component parallel to a reference line





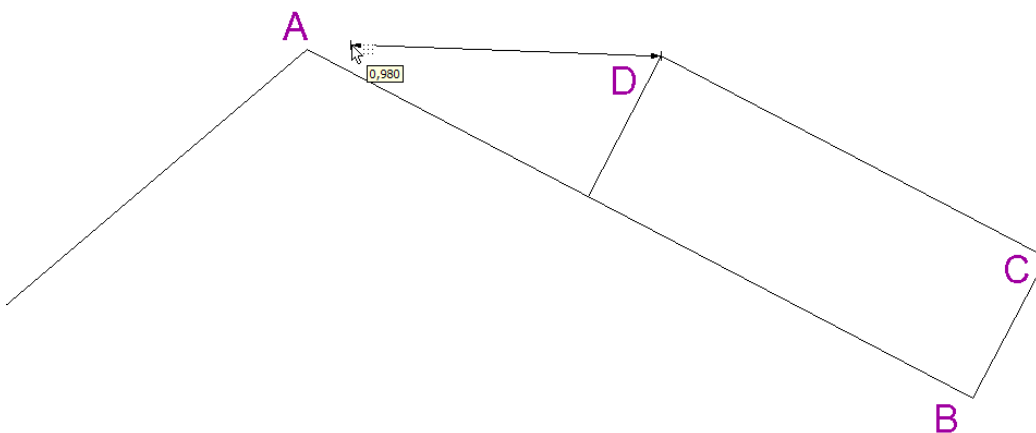
- Select line A-B for the reference line 
- Select the distance on reference point D or C
- Select start point on point C
- Select end point on point D



2.6. Additional option 1: Define component by two points

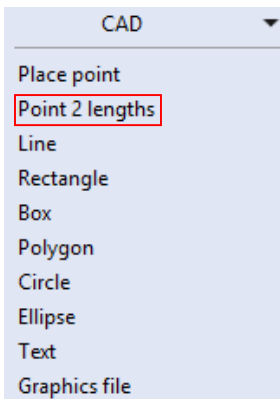


- Select reference point D with a left mouse click for the start 
- Select end point A with a Left mouse click 

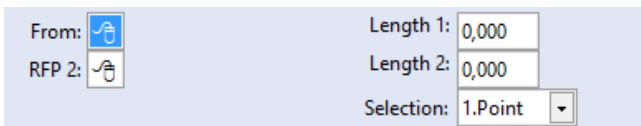



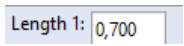

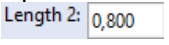
3. Help point via Point 2 lengths

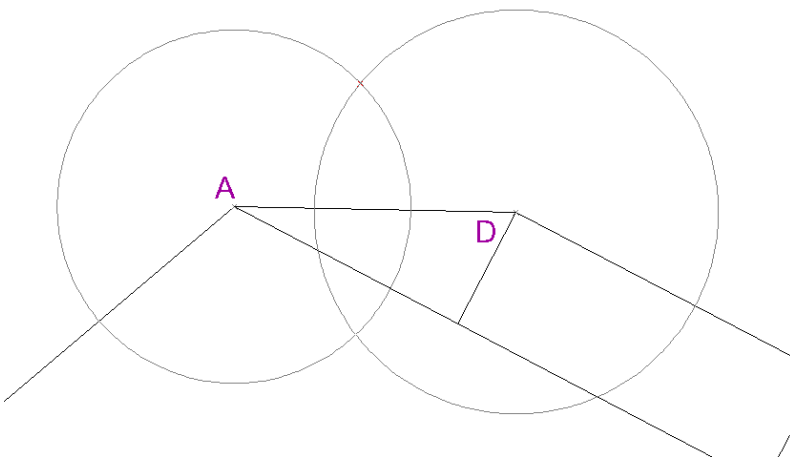
Select Point 2 lengths.



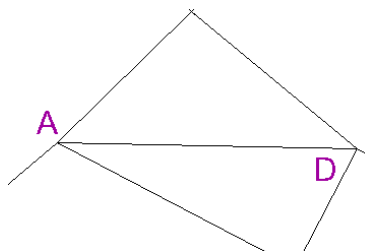
This Mask opens



- Select point A 
- Input of the first radius via 
- For the reference point 2 select point D 
- Input of the second radius via 
- The space button can be used to decide on which intersection the point has to be created. The selected point is marked with a red cross



Now the point can be connected to point A and point D via the function line and the 1 additional option.



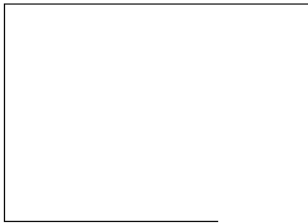
4. Rectangle/ Box

4.1. Difference between Rectangle and Box

4.1.1 Rectangle


A rectangle is created with 4 single lines. That means if you use the function punch/box the lines will be cut off where the punch box hit the red marked lines and they didn't connect again.

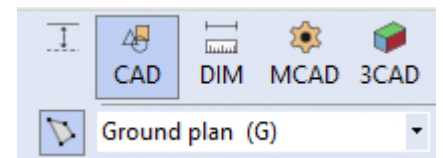
Example: Punch/Box on the right bottom corner.



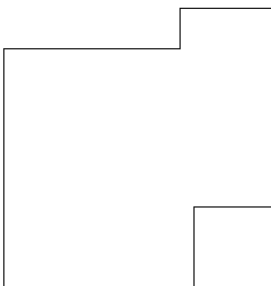
4.1.2 Box

Box means, four connected lines which build a surface will be created. In process the box behaves like a polygon. The lines are then reconnected and the surface is adapted.

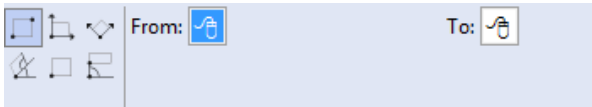
With this button  the box can be drawn as a polygon.



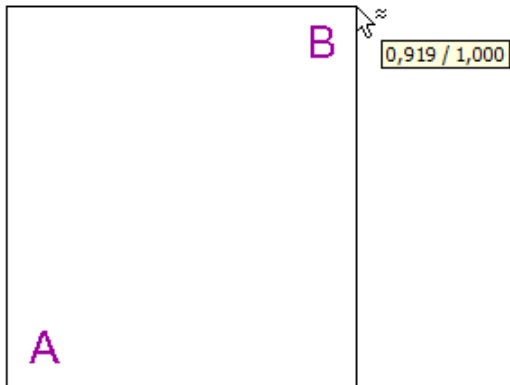
Example: Punch box on the right bottom corner + add on at the right top side.



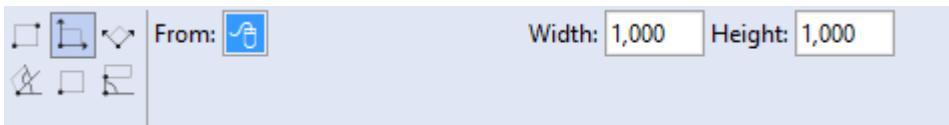
4.2. Additional option 1: Define component by two points



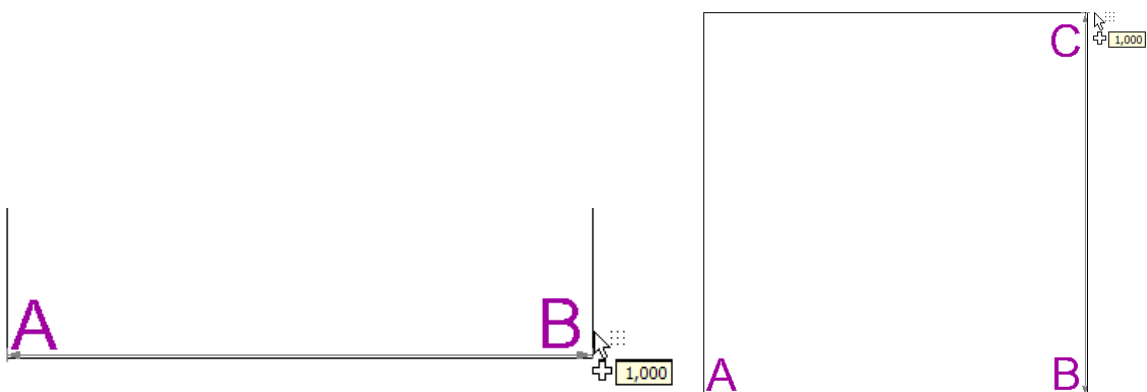
- Define startpoint with a left mouse click **From:**
- Bend the rectangle to B **To:**



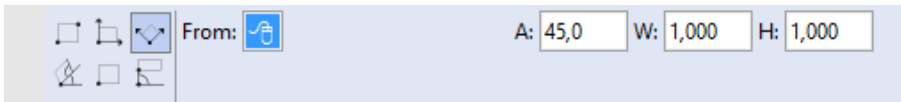
4.3. Additional option 2: Define component by width and height



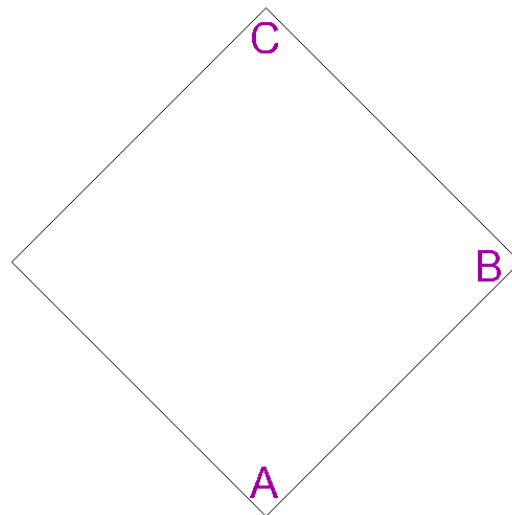
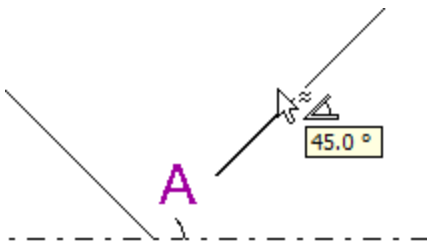
- Select a start-point **From:**
- Select width **Width: 1,000**
- Select height(C) **Height: 1,000**



4.4. Additional option 3: Define component by angle width and height

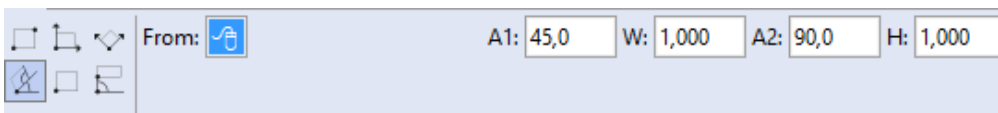


- Select a start-point
- Select an angle
- Select width (B)
- Select height (C)

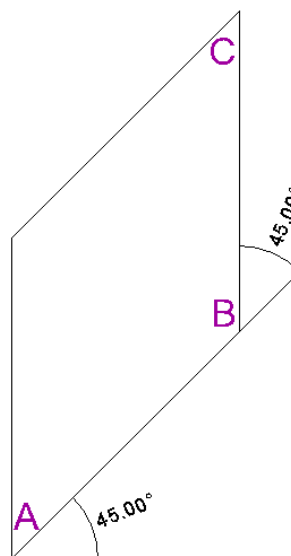


4.5. Additional Option 4: Define component by angle width angel height

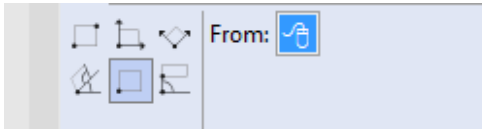
With this additional option you can create a parallelogram.



- Select a start-point
- Select angle 1
- Select width
- Select angle 2
- Select height

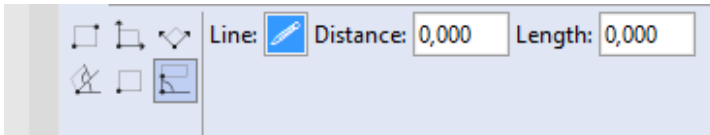


4.6. Additional option 5: Define component by one point

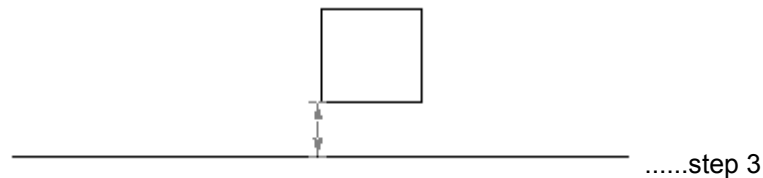
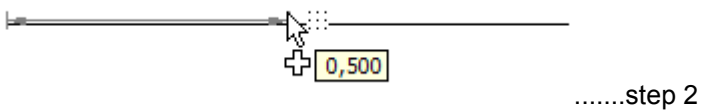
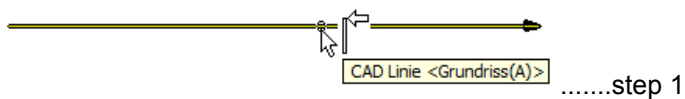


With this option, a rectangle can be used again. The insertion point is the lower left corner. The last drawn rectangle is inserted.

4.7. Additional option 6: Define component along a line

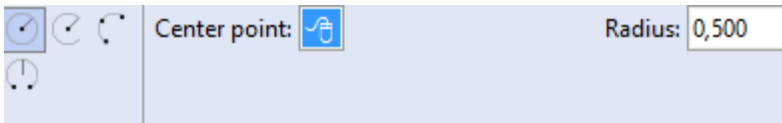


- Select a reference line **Line:**
- Distance from the start point of the reference point **Distance:**
- Select length (distance to the reference line) **Length:**

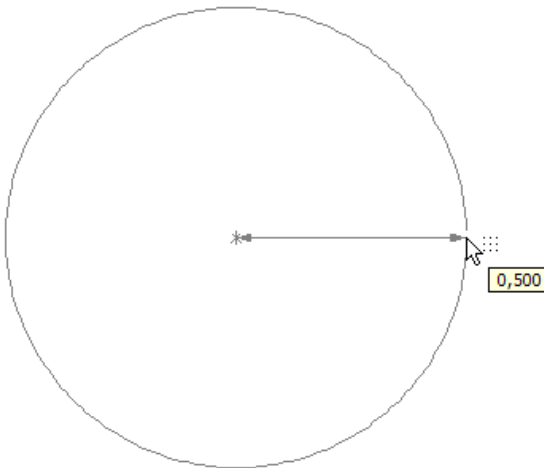


5. Circle

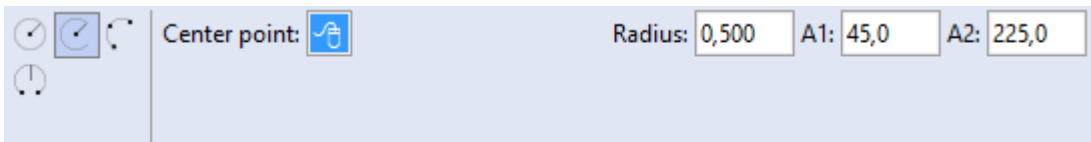
5.1. Additional option 1: circle by centerpoint and radius



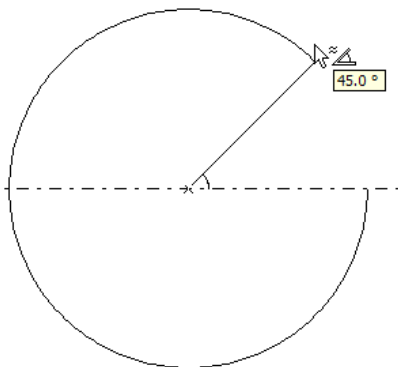
- Select center point
- Select radius



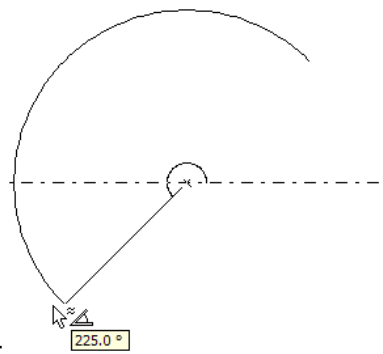
5.2. Additional option 2: segment of the circle by center point, radius and two angles



- Select center point
- Select radius
- Select angle 1
- Select angle 2

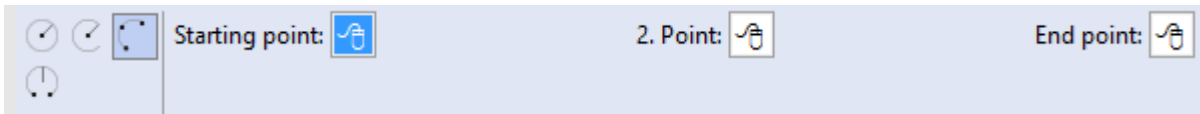


Angle 1:

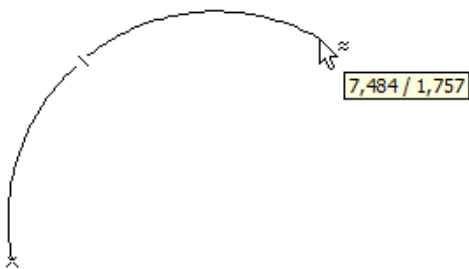


Angle 2:

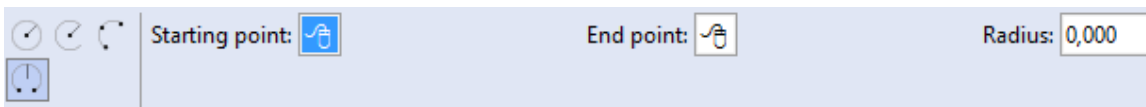
5.3. Additional option 3: Segment of the circle by 3 points



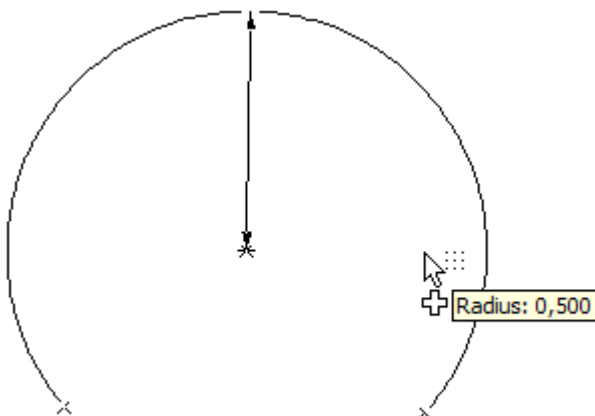
- Select starting point **Starting point:**
- Select point 2 **2. Point:**
- Select end point **End point:**



5.4. Additional option 4: Define Segment of the circle by two points and the radius



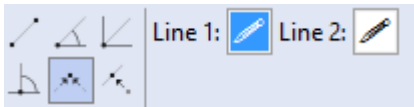
- Select starting point **Starting point:**
- Select end point **End point:**
- Select radius **Radius:** 0,000



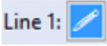
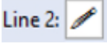
6. Place Point

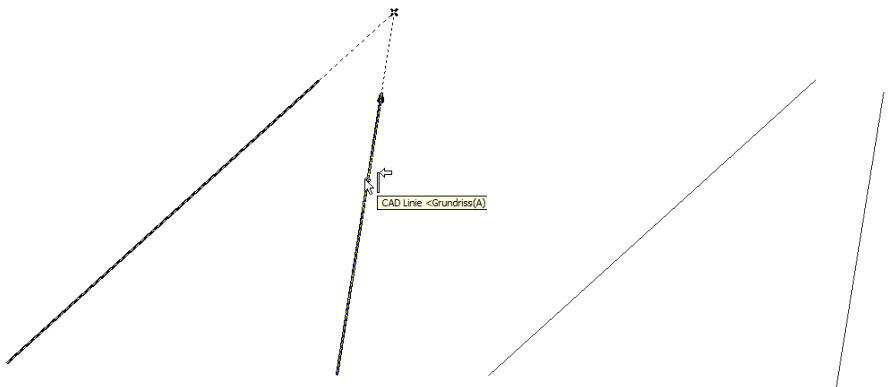
To place a point, you have 7 different additional options. The first four options are the same as in the creation of a line (see 1. Input of lines), the last three are special options to place a point, and are described below.

6.1. Additional option 5: Define point by point of intersection of two lines

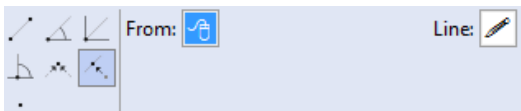


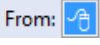

Two lines must be selected, at the intersection of these lines a point will be created. The lines don't have to cross, the imaginary intersection is enough.

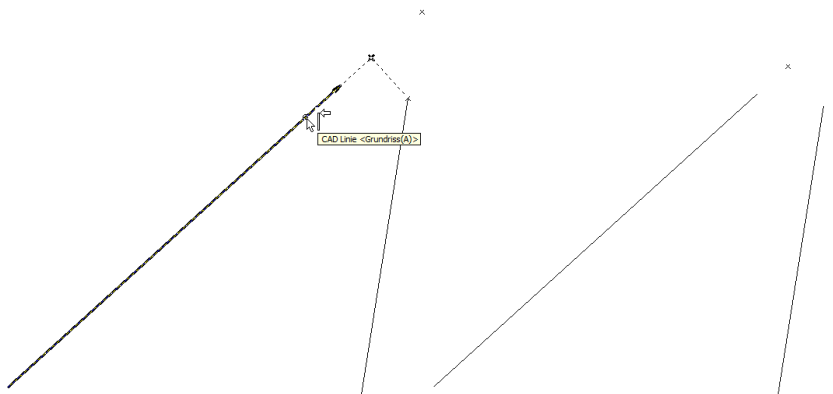
- Select line 1 
- Select line 2 



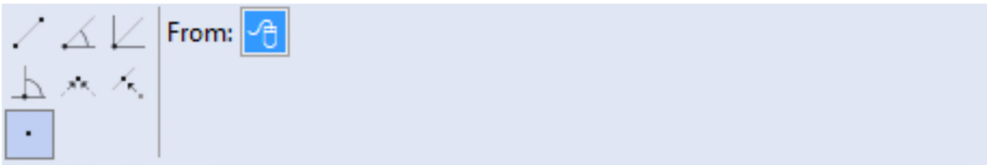
6.2. Additional option 6: Define point by projection of a line



- Select point which should be projected 
- Select a line on which the point should be projected 



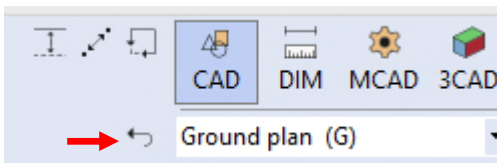
6.3. Additional option 7: Define point directly



A point is placed directly by clicking with the left mouse button.

7. Polygon

A polygon is a line that creates a surface. The additional options are the same as for the input of lines. The line must always be closed that the surface can be created. Single steps of the polyline can be reversed without completely deleting it.

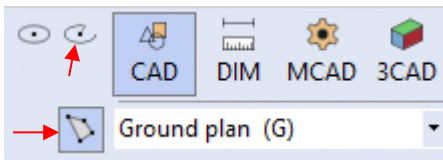


8. Ellipse

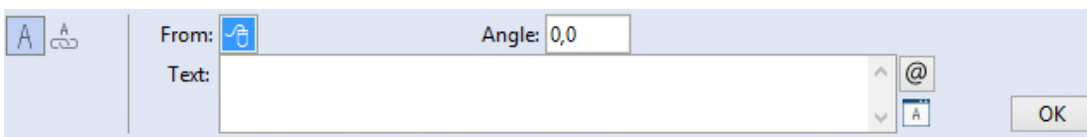
The input of an ellipse works via the same additional options like the input of a rectangle or box (see 4.). You can choose if the ellipse should be created from a center point or from outside.


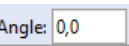





The input can be executed as a segment or as a polygon



9. Text



- Select start point of the text 
- Select an angle for the text 
- Text input 
- With  place holders can be inserted

The text field can be linked with a component. The Text is connected with the component, even if the position is changed. 

10. Graphics file

It is possible to import graphics in all popular formats. These graphics will be converted into a CAD polygon.

10.1. Other options

10.2. Move start point

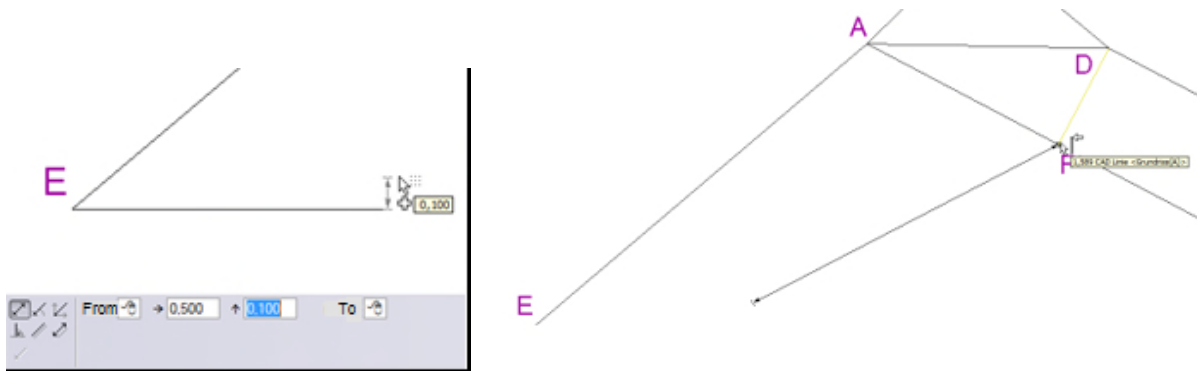
Is the dialog box **From:** or **To:** active, you can move the start-point.

Therefore push the space button

1 time space: **From:** A: 0,0 L: 0,000 **To:** (Angle/length)

2 time space: **From:** → 0,000 ↑ 0,000 **To:** (Coordination)

- Select point E **From:**
- Select the horizon distance to the start point E → 0.500
- Select the vertical distance to the start point E ↑ 0.100
- Select point F with a left mouseclick **To:**

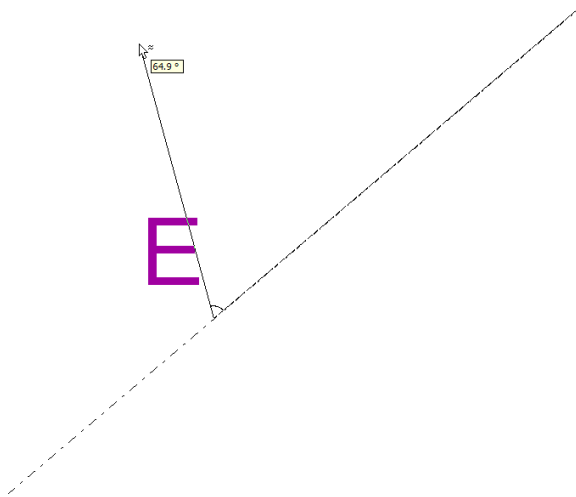


10.3. Change angle reference

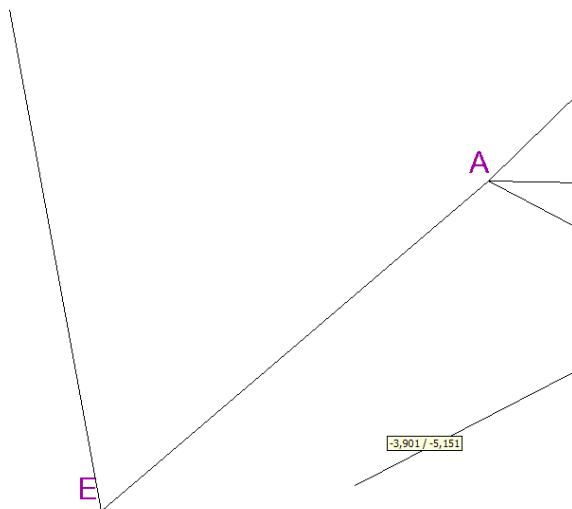
- With the F6 key and the empty key the reference line for the angular dimension can be changed.



- Select Line and take the additional option 2
- Select E for the start point
- Push F6 (Now the angle reference can be changed)
- Select the line between point E and point A near point as angle reference line

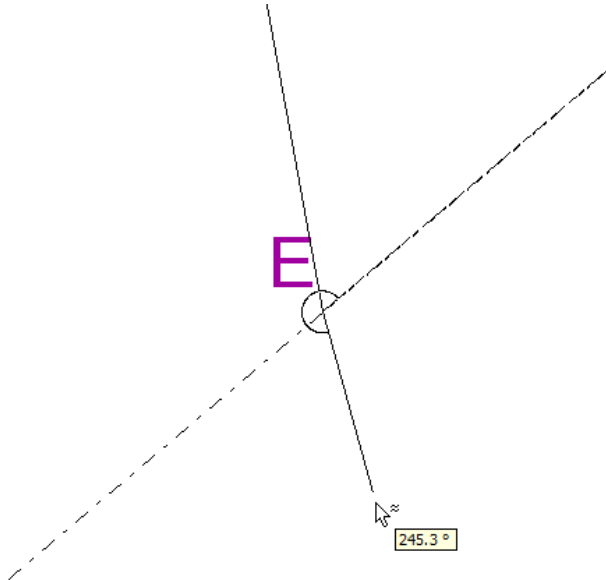


- Now the angle between line E-A and the new line can be entered
- Select length

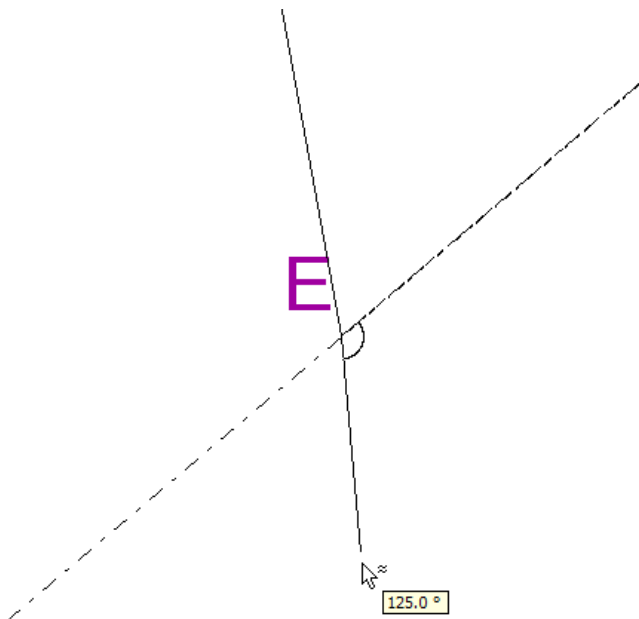


Example 2:

- Press the Enter key to call the last function
- Select start point E
- Push F6 (Now the angle reference can be changed)
- Select the line between point E and point A near the point A as angle reference line



- Push space (The direction of the angle changes)



- Now the internal angle between the new line and the line E-A can be entered

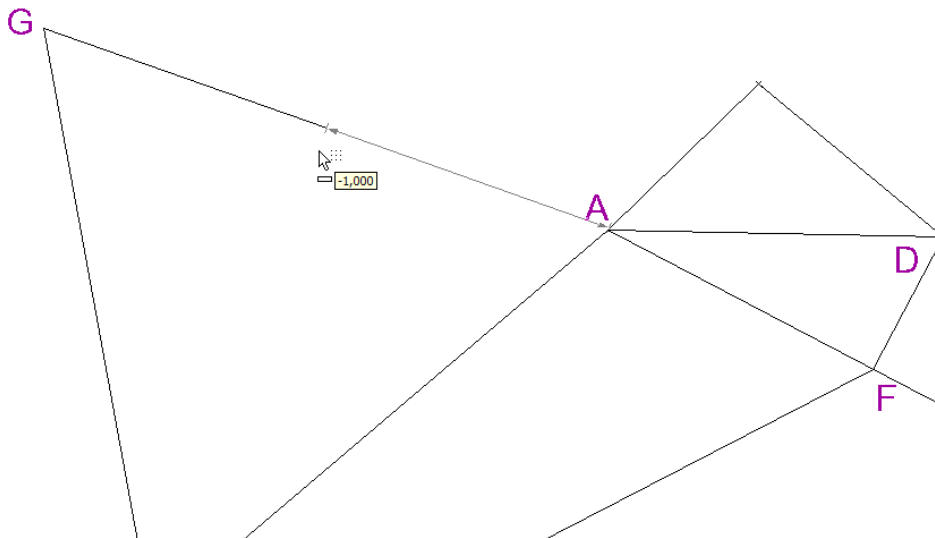
10.4. Change the length reference point

Use the right mouse button to change the length reference point

Example 1:



- Select the function line and the second additional option
- Select Startpoint A
- The length specification refers to the starting point of the line (Punkt G). If another start point is required press the right mousebutton.
- In this example, point A is selected as the length reference point with the right mouse button.



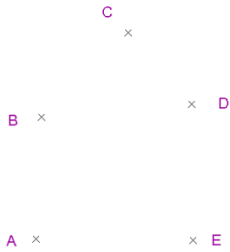
- The distance between point A and the end point of the new line can be entered
- Attention must be paid to the sign.

10.5. Line with enter

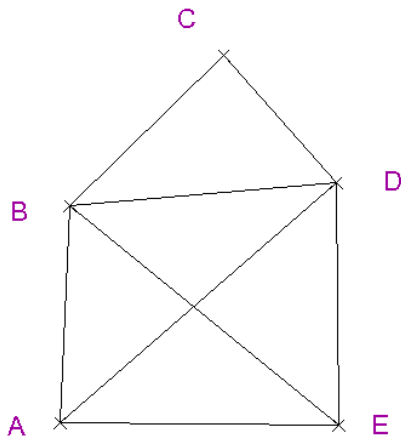
To draw a line, use the Enter key to start the next line at the end point of the previous line.

Example:

- Set any points for this purpose

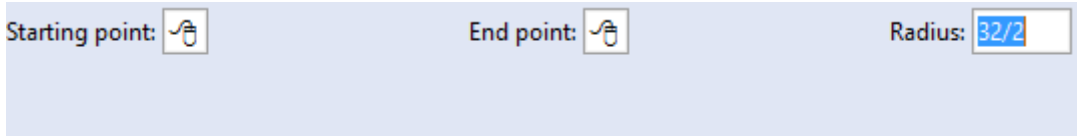


- Select line and the first additional option
- Select start point
- Select end point
- Push enter
- Select end point
- Push enter
- ...



10.6. Calculate the input

Each input field has an integrated pocket calculator. If, for example, the input of a circle is known instead of the radius of the diameter, it can be entered in the Radius field and divided by two.

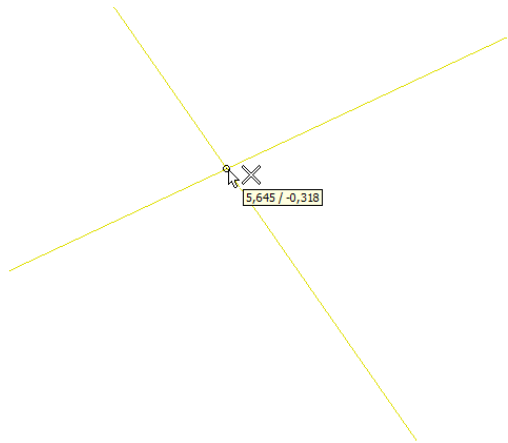


All basic calculus, exponents (^) and parentheses can be used.

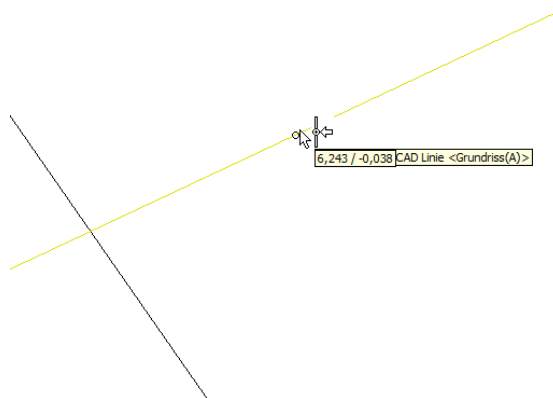
10.7. Catching of intersection and center point

To catch an intersection of two lines or the center of a line, press and hold the upper-case key until the point with the left-hand mouse is selected. A character with the mouse shows which point was caught.

Example intersection:



Example middle point:



10.8. Zoom function

To catch a desired point, the function zoom is often used.

To do this, push the control key "Ctrl" and click in the immediate area of the desired point. The zoom window opens. The control key can be released and the mouse can be used to select the desired point in the window. The window closes automatically afterwards.

