

modernknitting

Design Knittings with LibreCAD LESSON 2

For all knitters, machine or hand

by Harry Guetter

You have finished lesson 1 now and start with lesson 2. To see what you have passed and what still we be done we start each lesson with the overview of the lessons:

1. Lessons

We will have 6 lessons. I will build up the lessons step by step in the following weeks

Lesson 1: Modify an existing drawing (cut) to distinct personal dimensions

Content:

Learn about the use of zoom, layers and blocks

Modify dimensions, print in scale and use knit-radar

Without patterns

We use the drawing **Cut Sweater Man shaped with V-neck.dxf**

Lesson 2: Design a new drawing (cut)

Content:

We design a women's cardigan with double-round shaped neck

We save the drawing as **Cut cardigan woman double_round neck.dxf**

In Lesson 5 we will put pattern into this design

Lesson 3: Create a scaled grid for handknittings or machines without knit-radar

Content:

We create a grid to substitute the complete calculating for all shapings

Lesson 4: Create Pattern

Content:

We create mother-patterns in LibreCAD

Lesson 5: Put scaled pattern into a design

Content:

We use a mother-pattern

copy it into drawing **cut cardigan woman double_round neck.dxf**

We scale the pattern to mesh-size

We make a pattern-block

We orient the pattern-block in the drawing

We fix start-point and end-point of the patterning. Fix start-point of the pattern-block

Lesson 6: Create a small cupboard

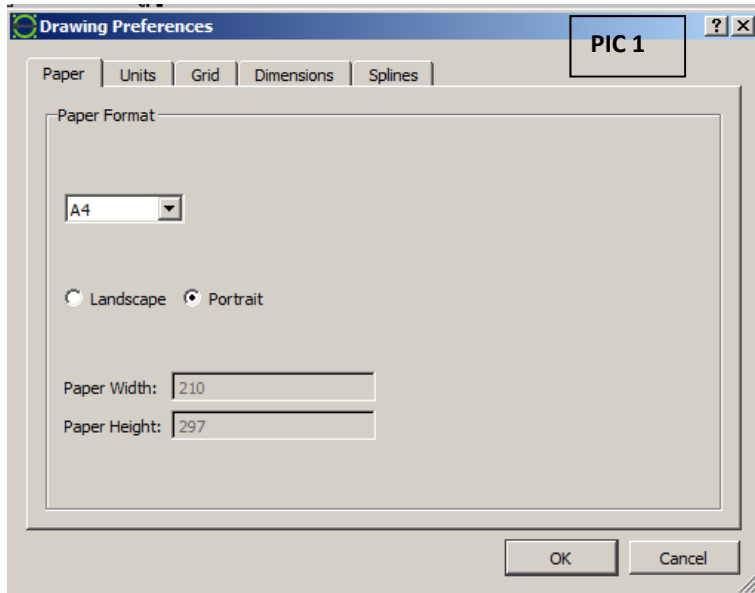
Content:

Construct a small cupboard to learn the use of LibreCAD for general items

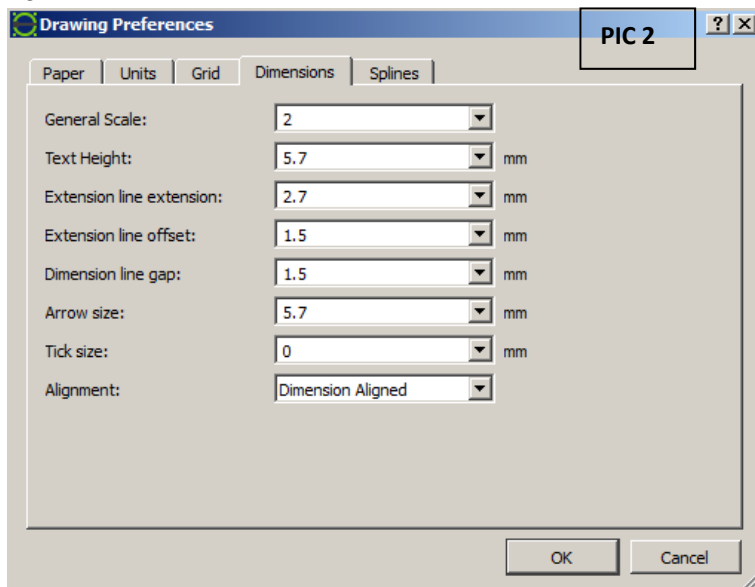
In this lesson you create a woman's cardigan and learn new commands. Now you do some general settings, that will be fixed to this drawing. This settings will not influence other drawings.

Current Drawing Preferences

"Edit", "Current Drawing Preferences"

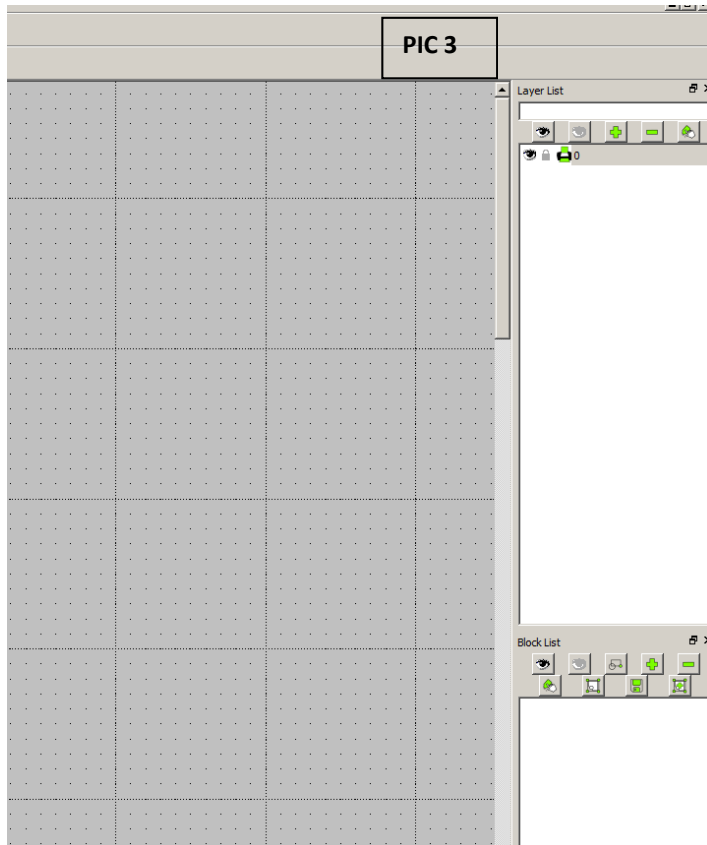


Click the single menus. You already know "Paper" (Landscape, Portrait...) We are working with "Dimensions" now.



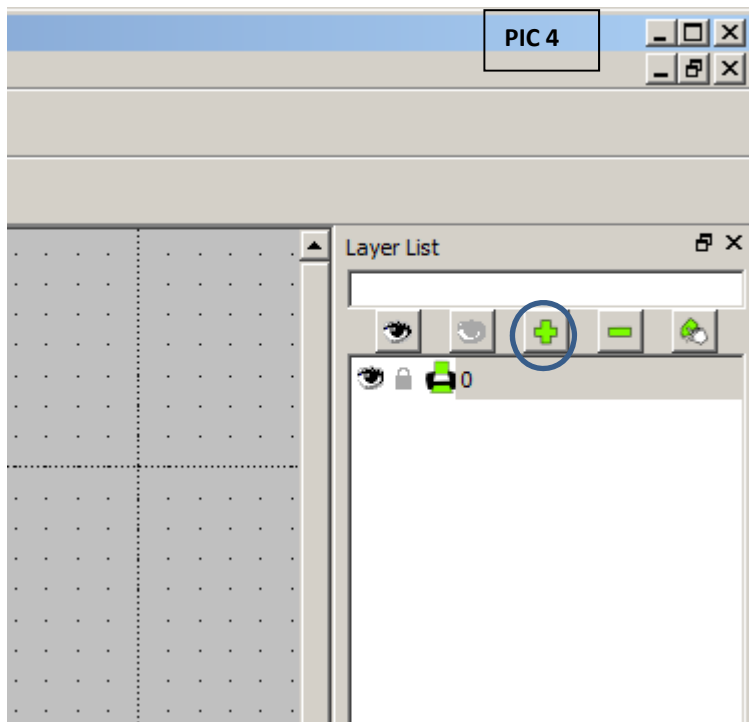
Chose the above settings. You have identic view to the manual then. Futur you can modify each single position or general all positions with "General scale". Play with it. But save the above settings now.

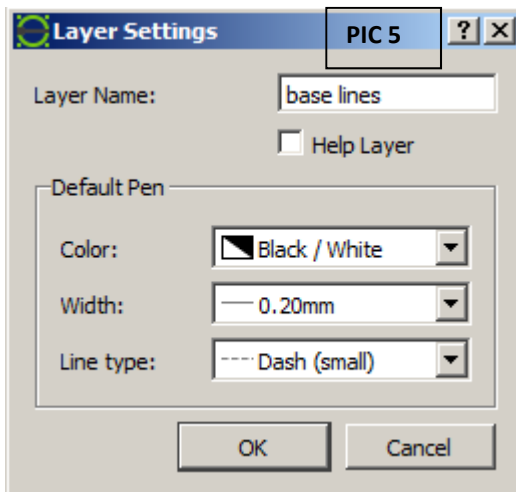
CREATE A LAYER



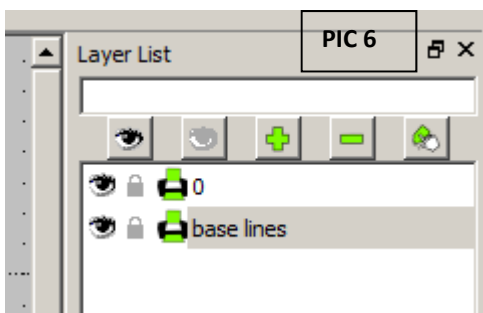
On right top of your screen you see the "Layer List". There is only one layer actually, Layer "0", which is always given to have a layer to start a drawing.

Layers are single levels/platforms of a drawing. They "lay" each over the other like coatings or films. Layers can be activated or deactivated- They can be made visible or invisible. When you are drawing anything you have to choose a layer in which you actually draw. If this layer does not exist actually you have to create it before. That is what we do now:





Set like above and save

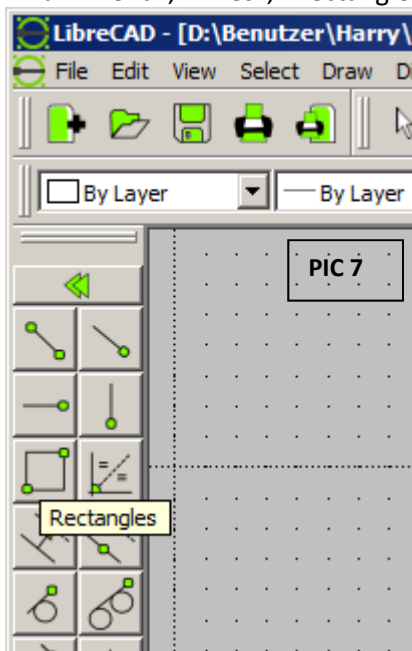


You have a new layer now. And it is **grey underlined**. That means it is **active**. To activate a layer you just have to click on its name. Try this. Click layer "0" and then layer "base lines" again.

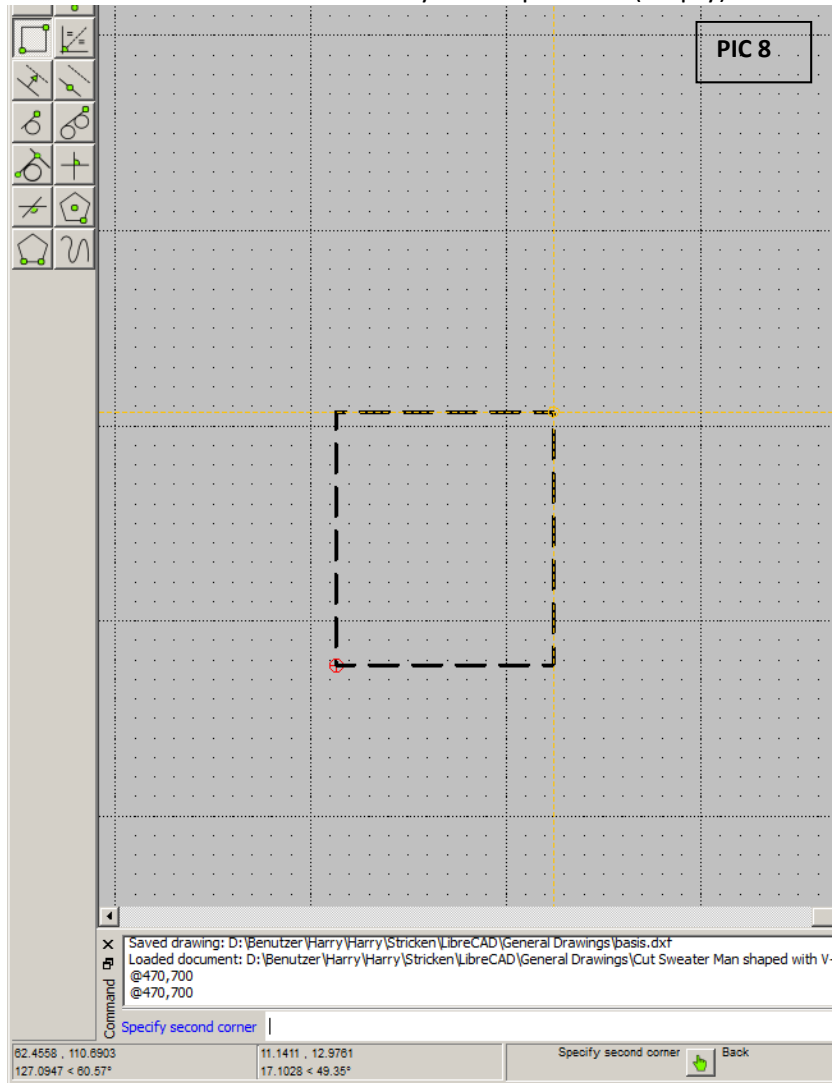
CREATE A RECTANGLE

You learn now to create a rectangle and to use @. @ is a very important command as it allows fast and exact constructions.

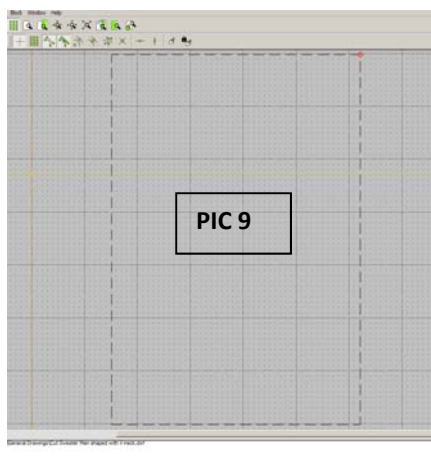
"Main Menu", "Lines", "Rectangles"



“Activate Free Snap”, left mouse-click somewhere on the drawing, do not hold the click, move to right-top, Then activate the **command-line** by enter space-tab (empty). The command-line is blue now.



Type @470,700 then “enter”. Then “Autozoom”. You remember: on the top of the screen, the different zoom-icons.

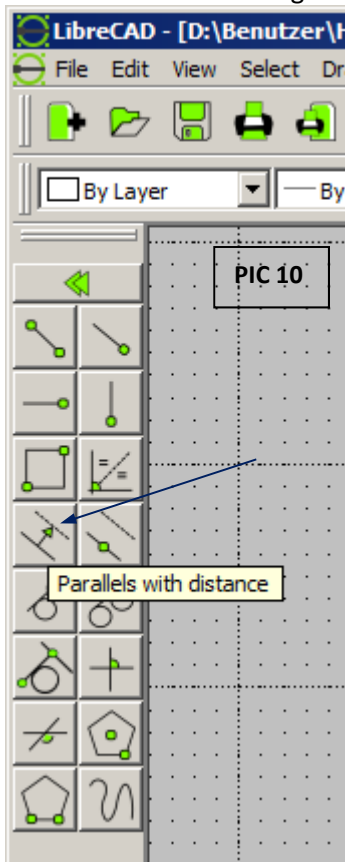


You see: you have drawn a rectangle with dimensions 470mm in X-direction and 700mm in Y-direction.

Remember: The @ makes that the last click is the 0-point of the following movement/order/construction
This is general!

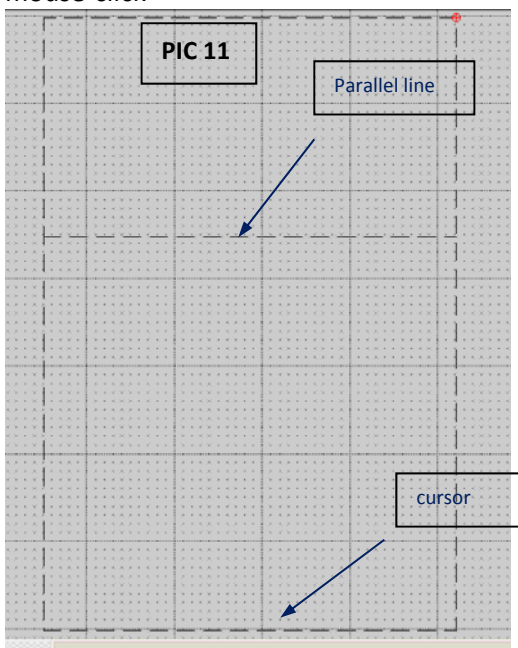
And you see that the lines are black, have a certain widths and are broken. This is as we gave the actual layer these attributes/properties.

The chosen dimensions 470x700 are the most outer lines of our design. Now we will move step by step to the center with our design.



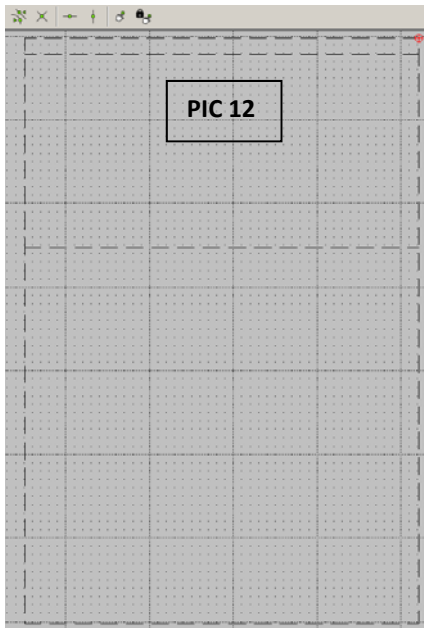
We draw parallel lines. Click “Parallels with distance”, “Specify distance” type 450 into the field on top of the screen or better: activate command-line with click on space-key and type 450 into the command-line. Both gives the same result. Command-line is general. Use the command-line as much as possible. It is fast. Then enter.

Now move the mouse near above the down-basis-line until you see the parallel-line appearing. Then left mouse-click



The parallel is drawn.

Next parallel-line. The menu is still active. Activate command-line and type 20. Move cursor near to the top-basis-line, parallel appears, click

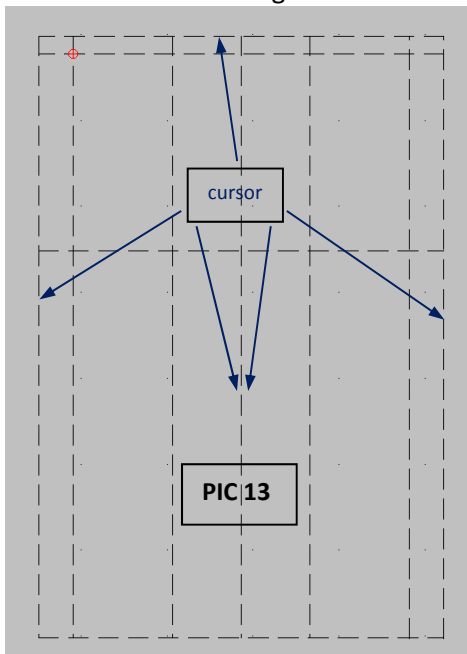


Next parallel lines, the menu is still active. Activate command-line and type 235. Move cursor near to the left-basis-line, parallel appears, click. Enter.

Next parallel lines, the menu is still active. Activate command-line and type 40. Move cursor near to the left-basis-line, parallel appears, click. Enter. Move cursor near to the right-basis-line, click. Enter.

Activate command line and type 80. Move cursor near to left side of vertical center line, click. Enter.

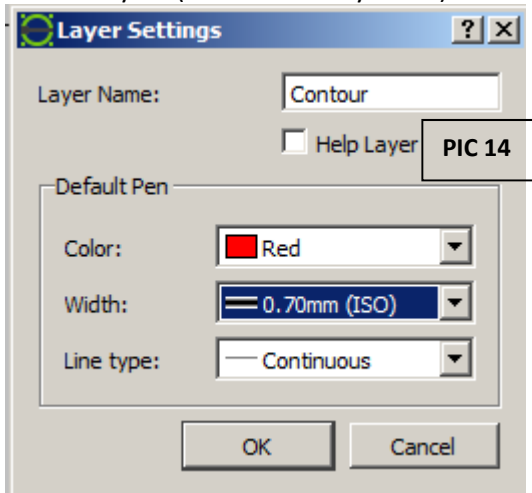
Move cursor near to right side of vertical center line, click. Enter.



DRAW CONTOUR LINES

With the base-lines we have constructed a grid that helps us to draw the contour-lines of the cardigan. We draw these in an own layer to distinguish them from all other lines.

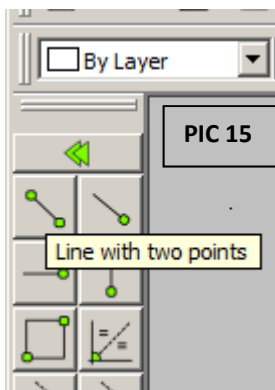
“Add a Layer” (the + in the Layer List)



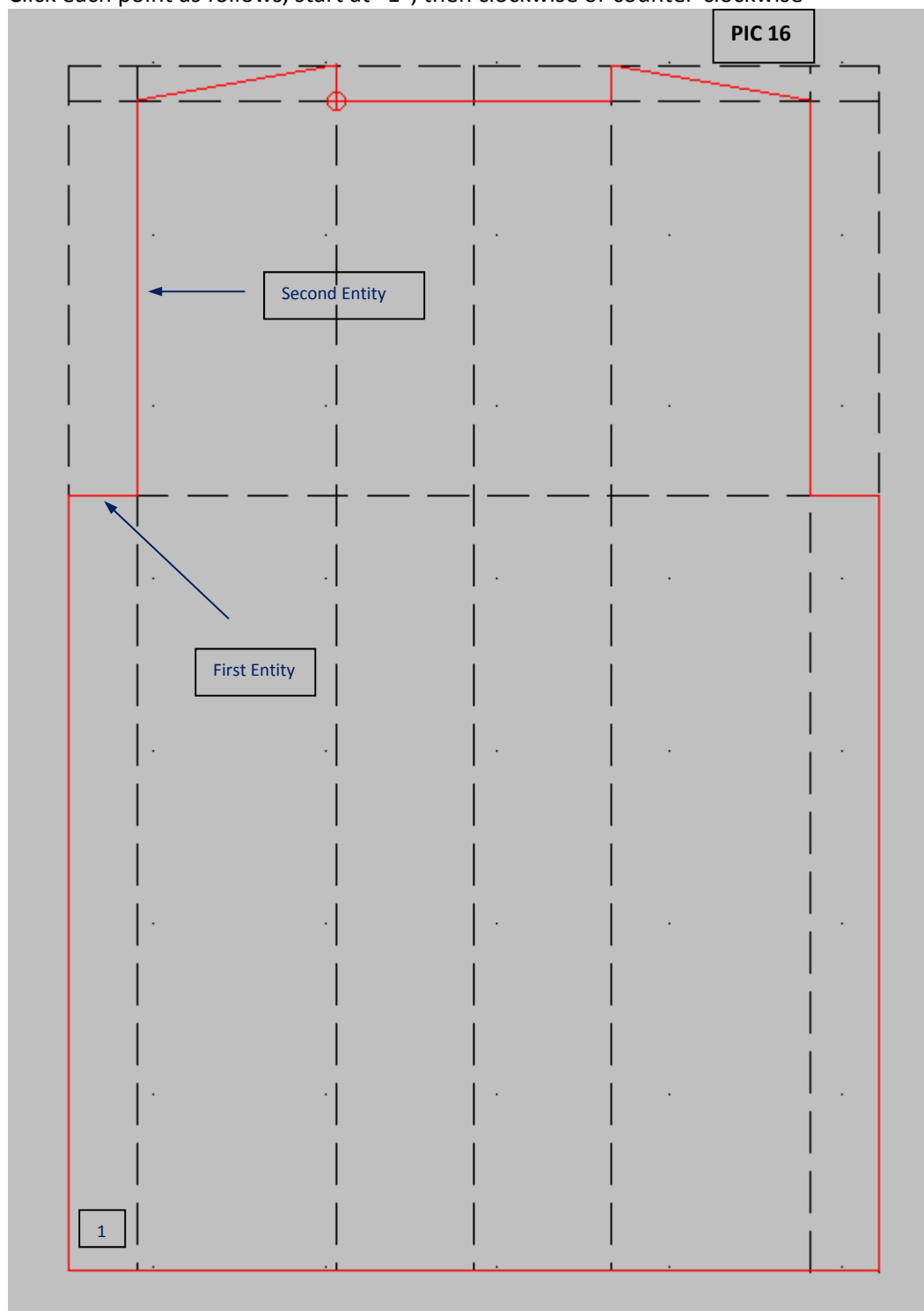
Check that “Contour” is the active layer (grey underlayered).

Remember: Before you start drawing check always if the desired layer is the active layer

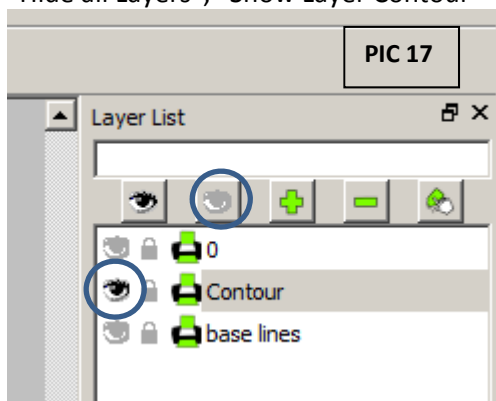
“Lines”, “line with two points”, Deactivate all snaps, activate “Snap Intersection”



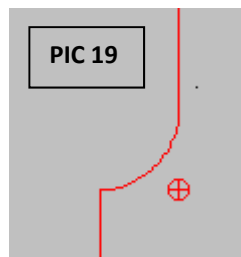
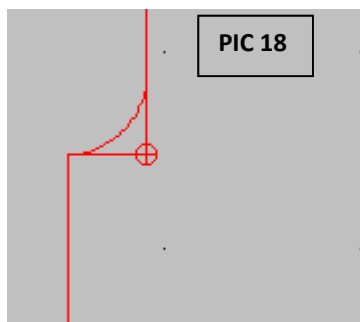
Click each point as follows, start at "1", then clockwise or counter-clockwise



This is the contour of the backside. We will modify it now.
 “Hide all Layers”, “Show Layer Contour”



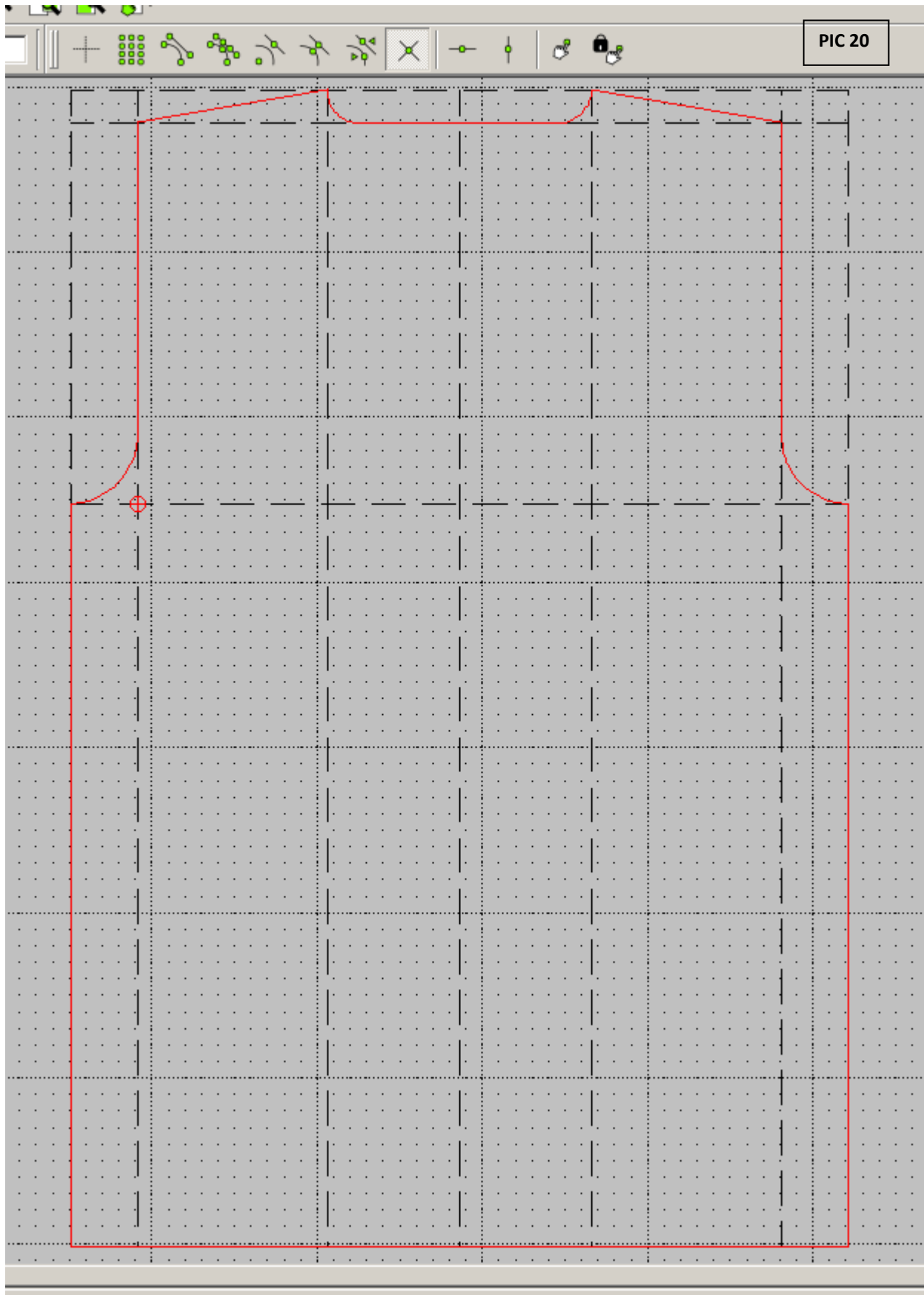
“Modify”, “Round”, then on top of the screen Radius: “40” . We chose “40” as the distance for the inset sleeve is 40mm. “Specify First Entity” as shown on PIC16, left mouse-click.
 Move the cursor a bit around and you see that LibreCAD serves different locations for the rounding. Select The following when clicking “Specify Second Entity”



Do the same with the right sleeve

Then do the same with the neckline with Radius “20”

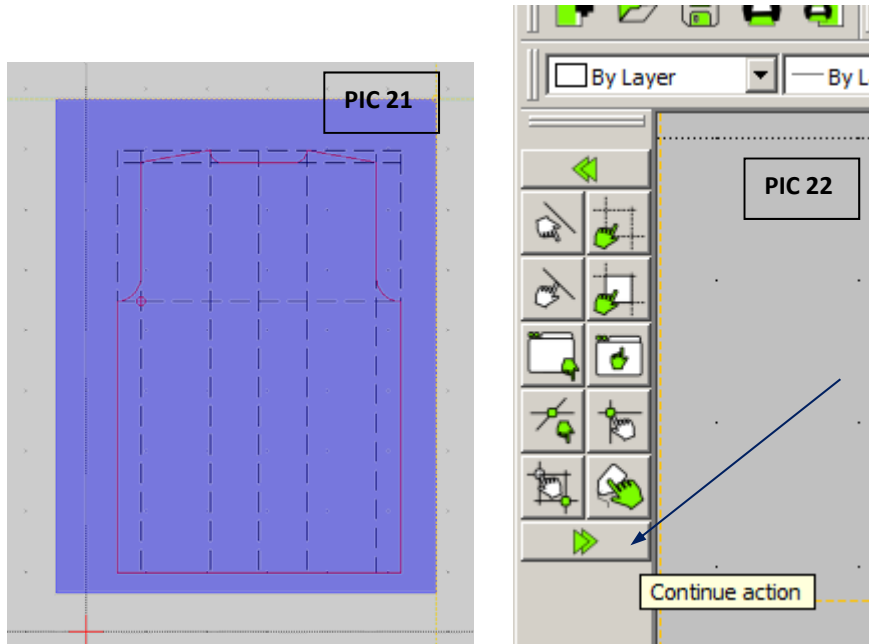
Now “Show all Layers” and your drawing should look like PIC20



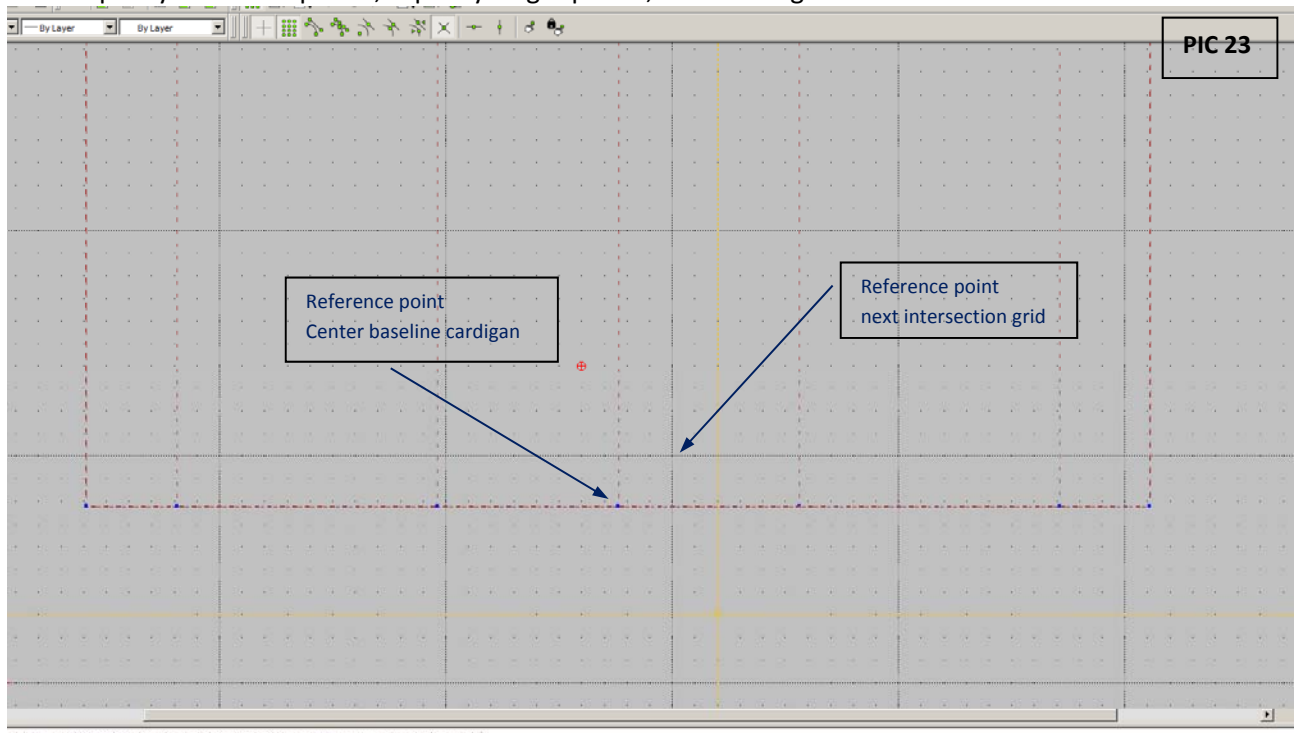
MOVE / COPY

The next step is not necessary, but all looks better and you learn command Move/Copy.

Turn the mouse-wheel towards you to minimize the drawing a bit. Then “Modify”, “Move/Copy”, on the left side of the screen “Select Window”, “Click and drag for the selection window”. Click left side bottom, do not hold the mouseclick, move to right top and click. You have selected the complete cardigan. Finish the selection with “Continue action”

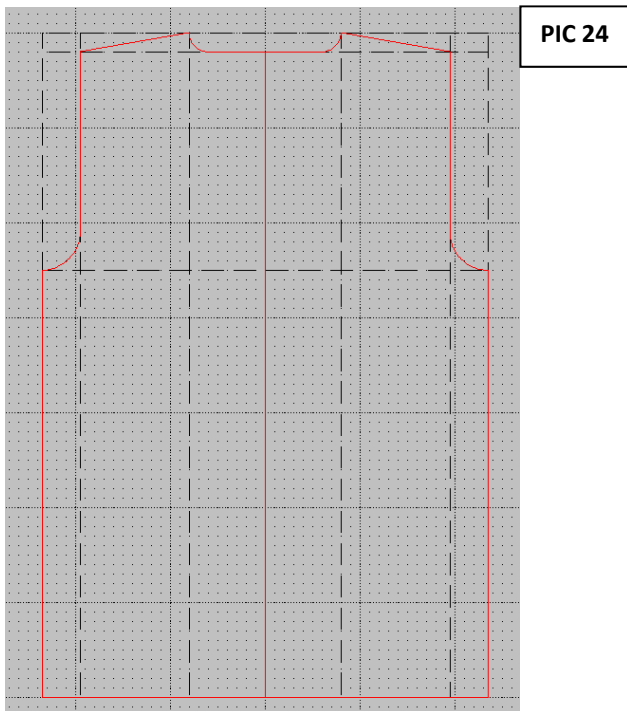


Activate ONLY “snap on grid” and “snap intersection”, roll mouse-wheel away from you to enlarge the drawing, click and hold mouse-wheel to move PAN the drawing until you have a result similar PIC23. Then “Specify reference point”, “Specify target point”, “Delete original”.



“Auto-Zoom”, ESC, ESC . The drawing is now centered to the grid. That looks better and you have learned some commands.

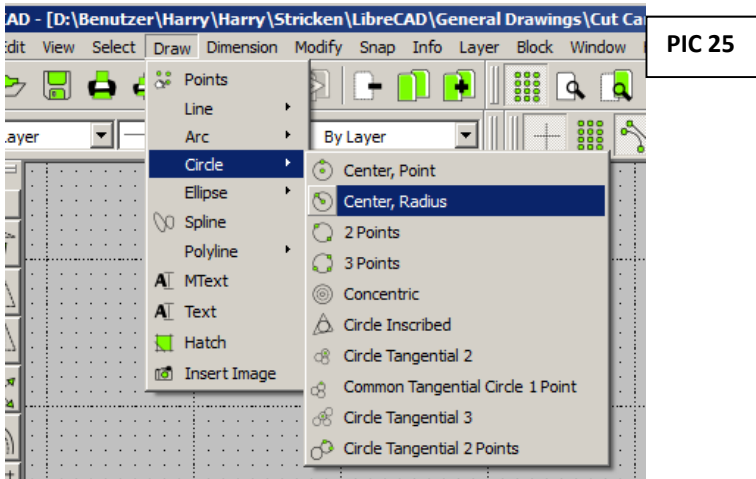
Activate layer Contour and draw the centered vertical line.



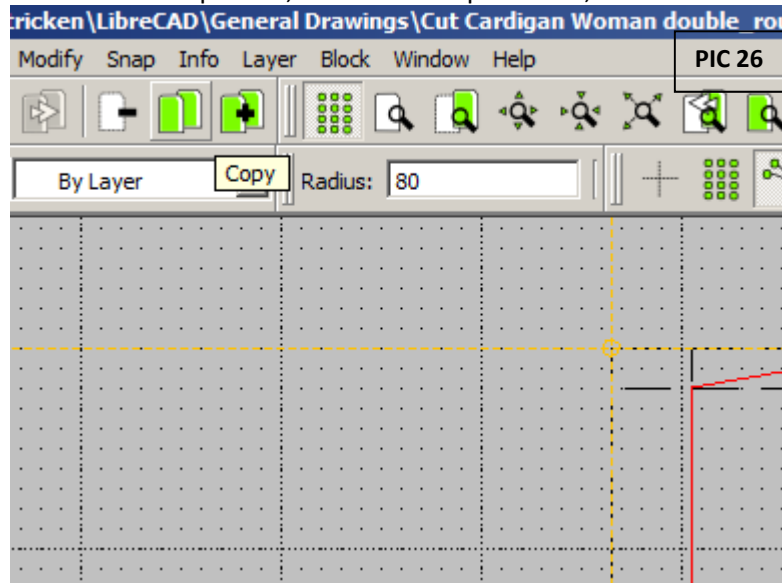
Double-Shaped Neckline

We will shape the left upper part of the centered vertical Contour-line. In first step we draw a circle with half diameter of the neckline. Our neckline actually is 160mm.

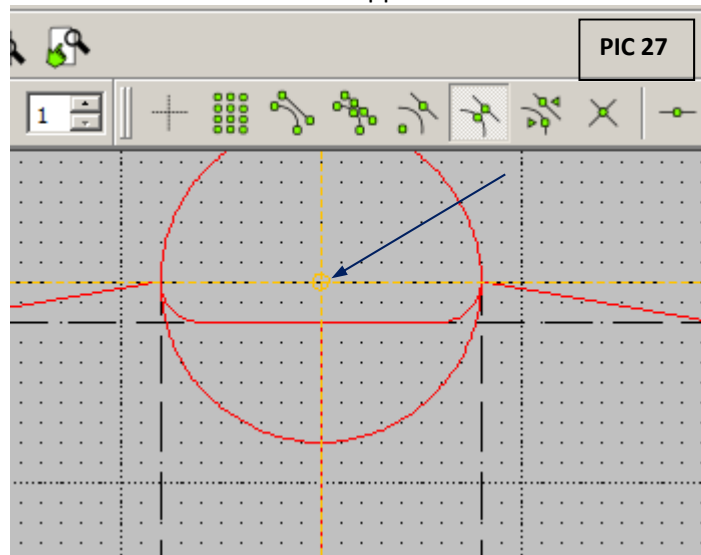
“Draw”, “Circle”, \$Center, Radius”



Deactivate “Snap Free”, Activate “Snap Middle”, Radius 80



Position mouse to middle of upper basis-line. Click.



You have drawn a circle with radius 80mm.

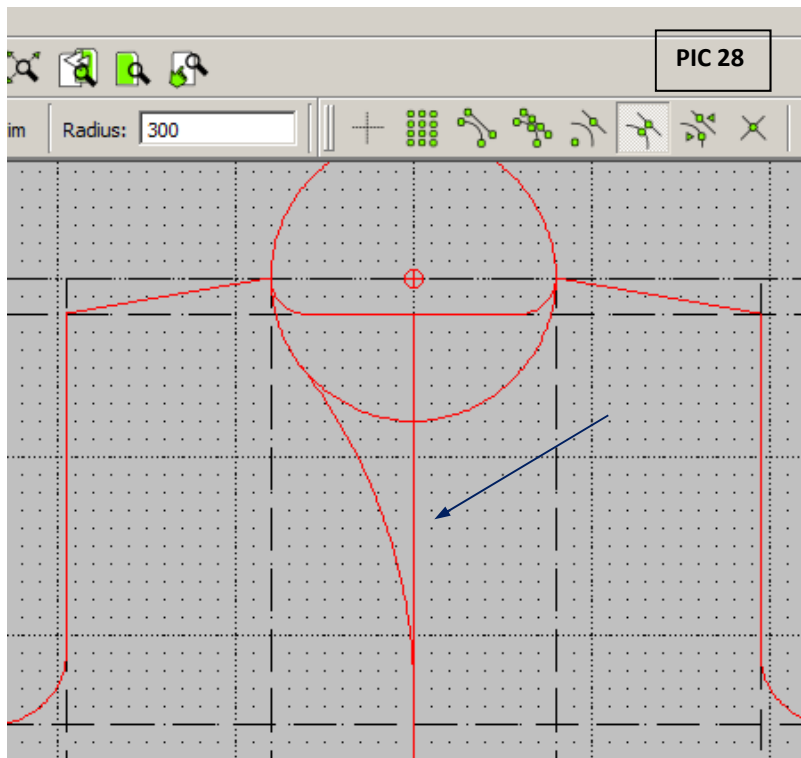
Now we shape the line. We round the radius and the vertical contour-line together.

“Modify”, “Round”

Radius: 300

“Specify First Entity”: Select the Circle 80mm

“Specify Second Entity”: Move mouse near the position in PIC28. Until you see the shown curve. Click.



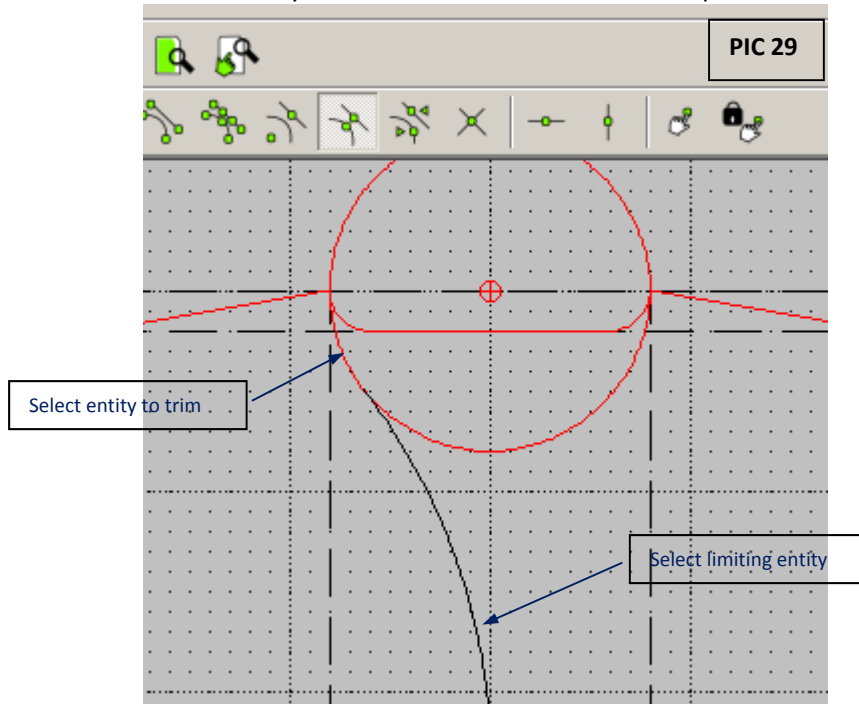
The vertical line is trimmed. Now we have to trim the circle. We do that in 2 steps.

“Modify”

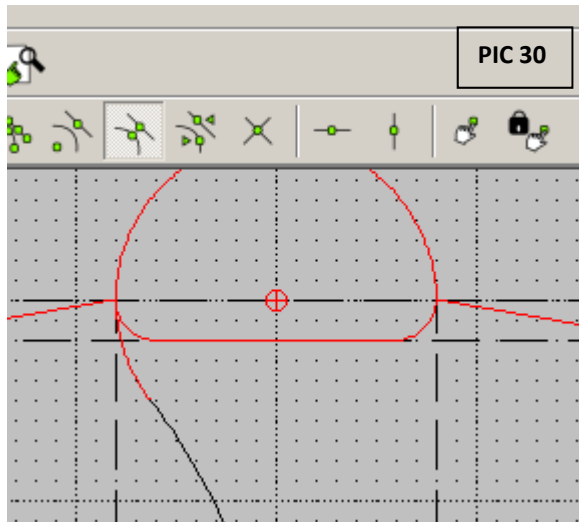
“Trim”

“Select limiting Entity”: shaped part of center-contour-line

“Select Entity to trim”: the circle 80mm on the part that we want to stay as upper shape:



Result:



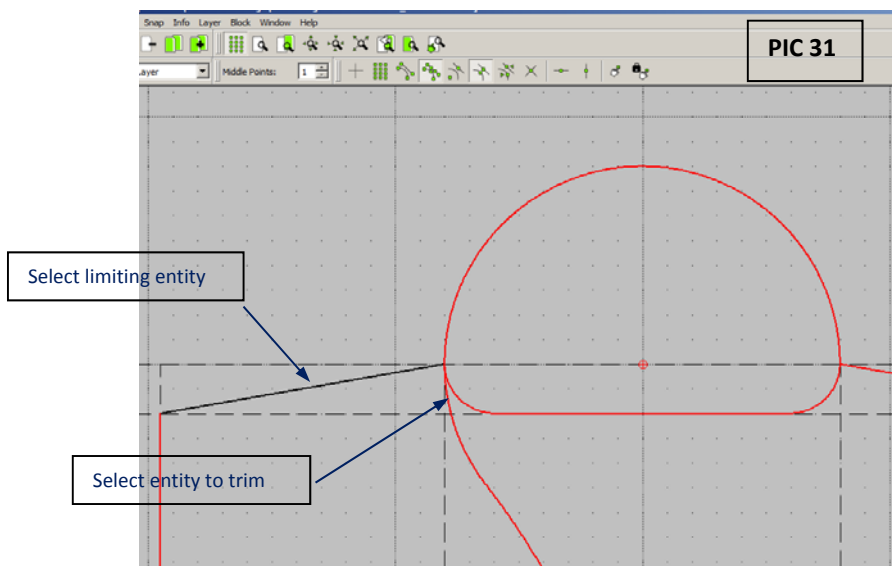
ESC, ESC to get a free command. Again

“Modify”

“Trim”

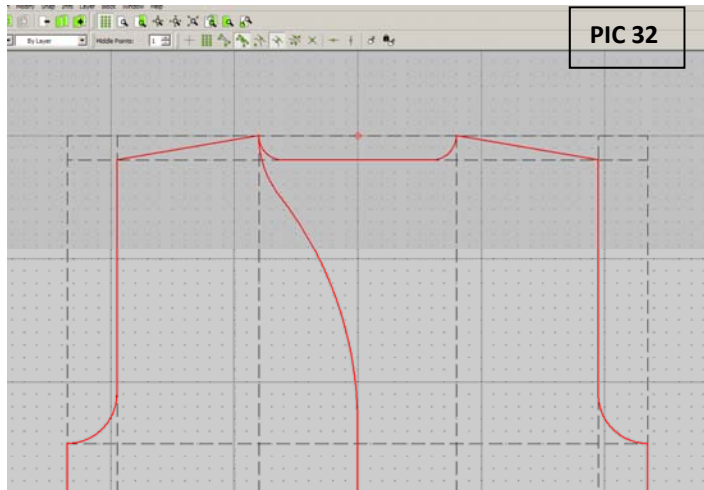
“Select limiting entity”: left shoulder line

“Select Entity to trim”: the circle 80mm on the part that we want to stay as upper shape (very on top):



Remember: If you did a wrong step you can UNDO it

Result:



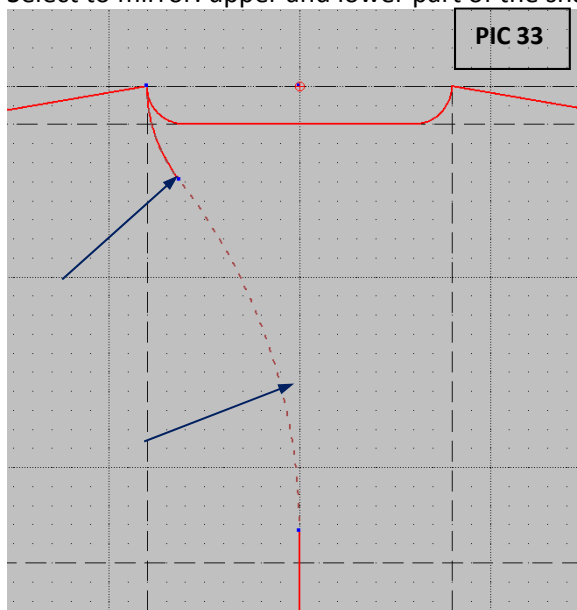
MIRROR

We mirror the left shape-line to the right side.

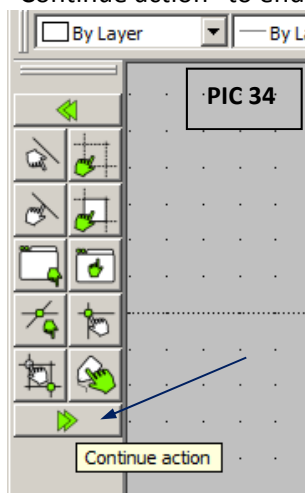
"Modify"

"Mirror"

Select to mirror: upper and lower part of the shape-line



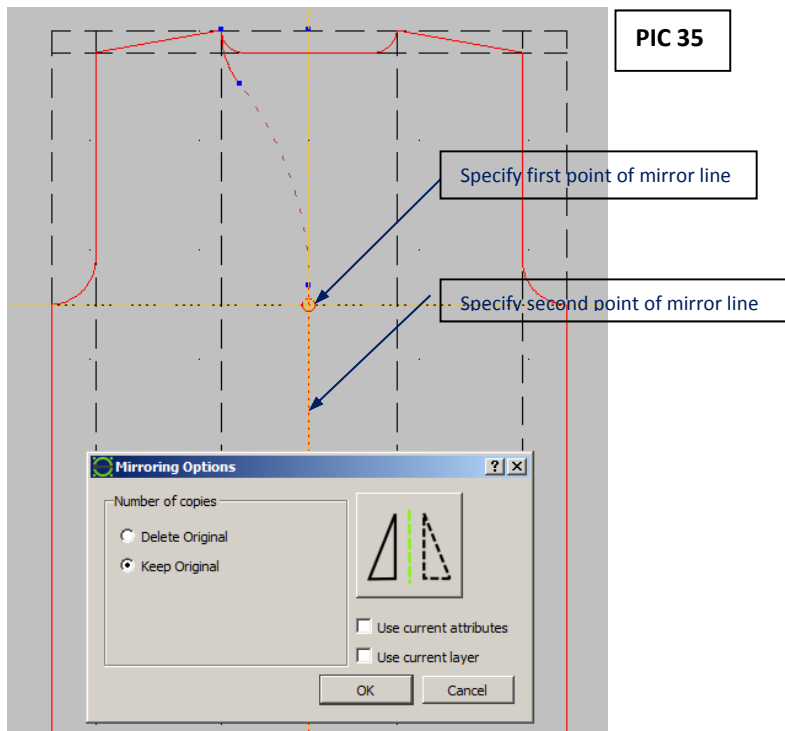
"Continue action" to end the selection



Activate ONLY “Snap Intersection”

Specify first point of mirror line: top of vertical center-contour-line

Specify second point of mirror line: vertical center-contour-line on a place more down



“Keep original”. “OK”

We draw the center vertical base-line:

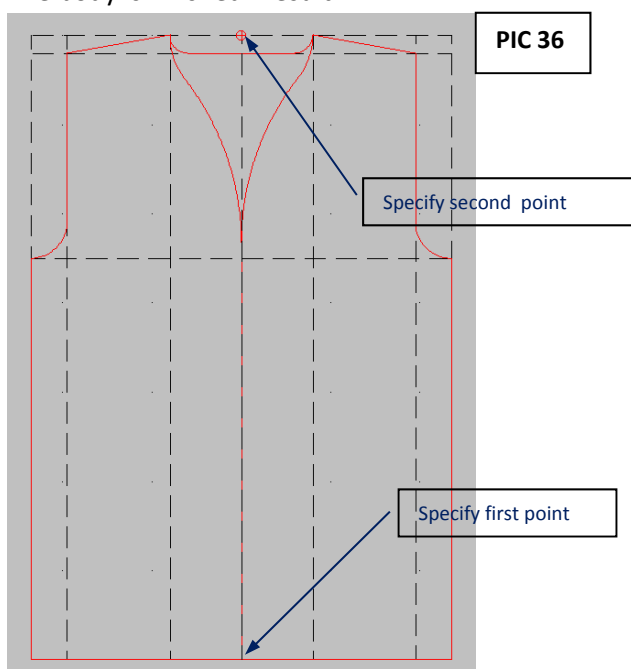
Activate “Snap intersection” and “Snap middle”

Activate layer “base lines”, “Draw”, “lines”, “Two points”

Specify first point: center base-line bottom

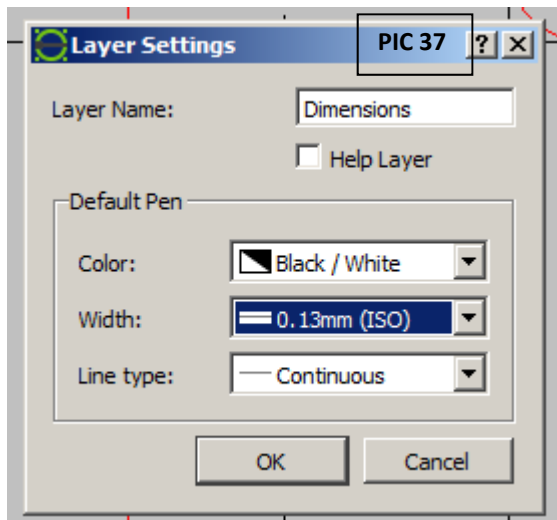
Specify second point: center base-line top

The body is finished. Result:



DIMENSIONING

Add a layer



Snap ONLY "Snap Intersection"

"Dimension"

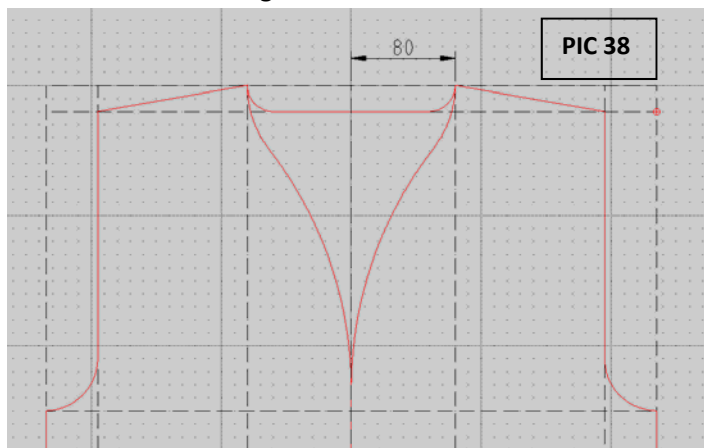
"Horizontal"

Specify first extension line origin: see pic

Specify second extension line origin:

Activate ONLY "Free snap"

Position Dimensioning-line as PIC38



Snap ONLY "Snap Intersection"

Specify first extension line origin: see pic

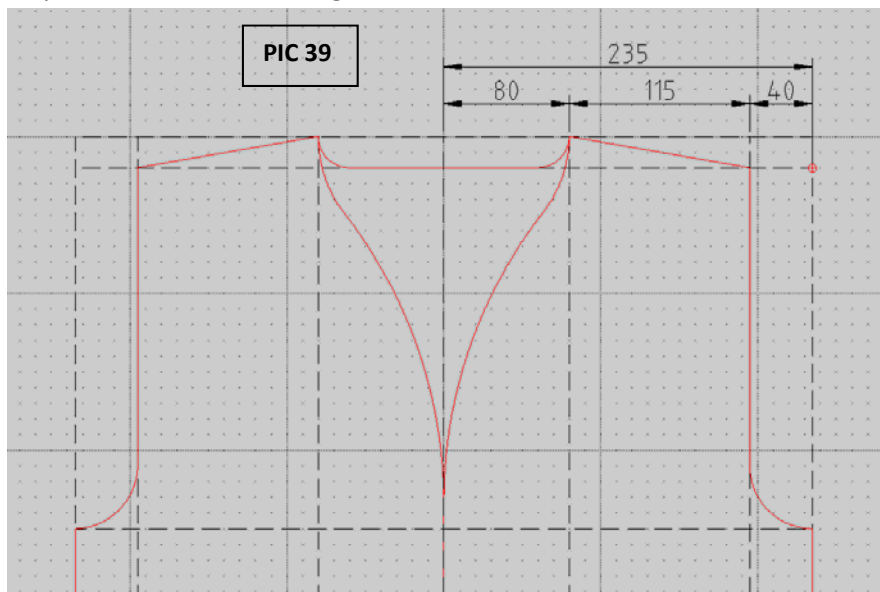
Specify second extension line origin:

Activate ONLY "Free snap"

Position Dimensioning-line as PIC38

Repeat these *****

steps for each Dimensioning-line. Result



Do the same for the vertical dimensions

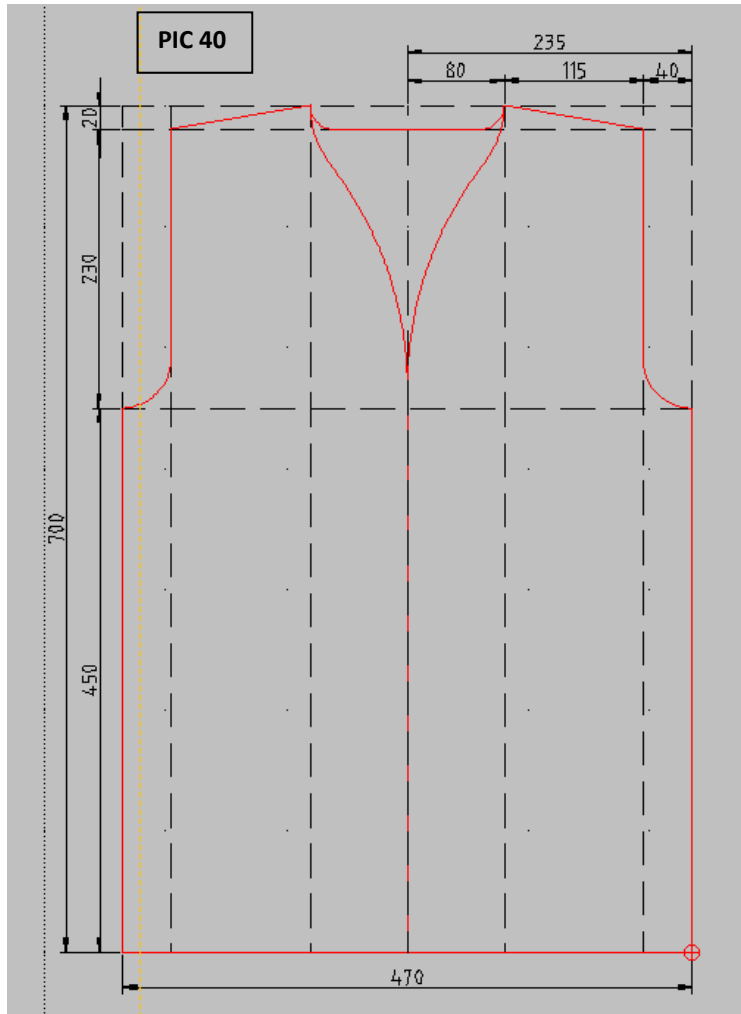
Snap ONLY "Snap Intersection"

"Dimension"

"Vertical"... and so on.

And for the horizontal basis-line

Result:



Now-if you like you can round the inner edges:

Hide layer base lines

DIVIDE

First we divide the horizontal contour line in two parts, as we need a left part and a right part.

"Modify", "Divide"

Specify entity to cut: bottom base line

Specify cutting point: center of bottom base line (Snap: ONLY intersection or endpoint! To get an distinct point)

ESC, ESC

The base line is divided . If you click on the right side, you activate only this part, on the left side dito.

Now we round the two edges:

"Modify", "Round", Radius: 50,

Specify first entity

Specify second entity

On both sides of the center

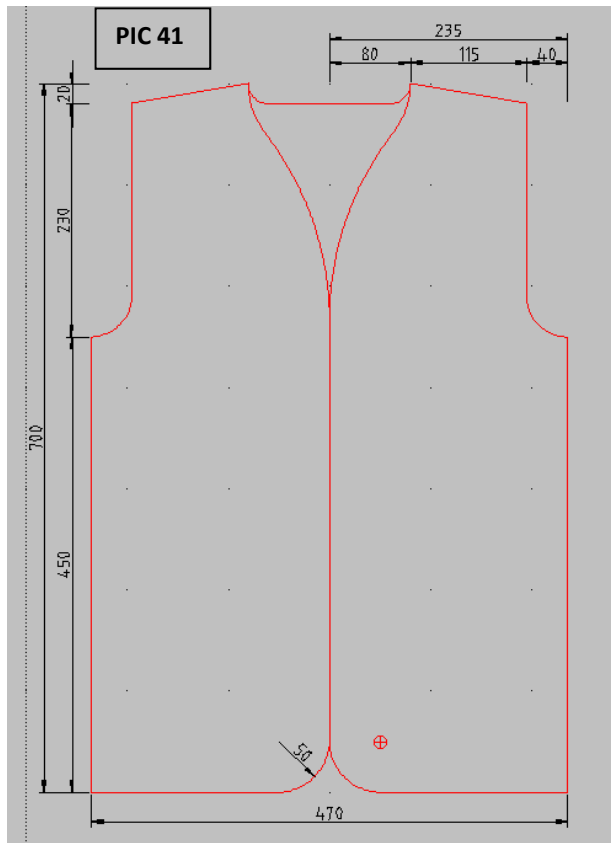
DIMENSION RADIUS

We dimension the radius. Activate ONLY "Free Snap", Activate layer Dimensions

"Dimensions", "Radial"

Select arc or circle entity: select the radius and place the dimensioning

Result:

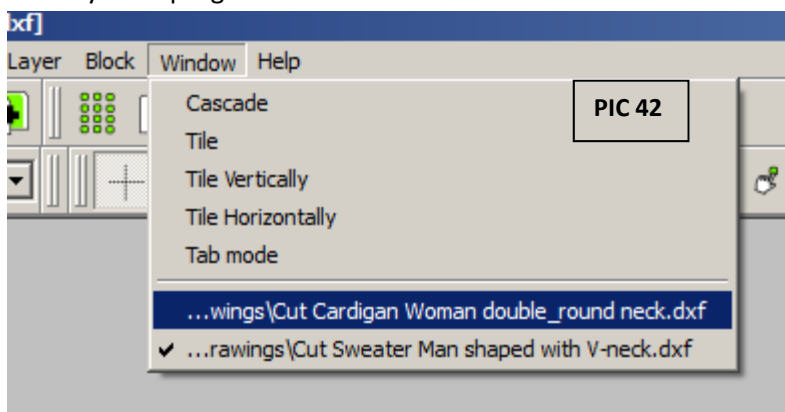


COPY AND PASTE BETWEEN TWO DRAWINGS

We copy print-line and position of the row-ruler from drawing "Cut Sweater Man shaped with V-neck.dxf". Open this file via "File", "Open"...

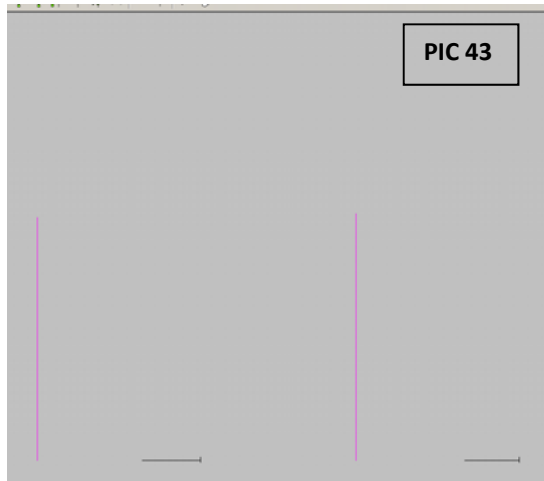
Do not open the file direct with your file-explorer. This would open LibreCAD a second time and you would not be able to copy from drawing to drawing.

After you have opened the drawing you can see in "Window" that two drawings are opened with the actually used program:

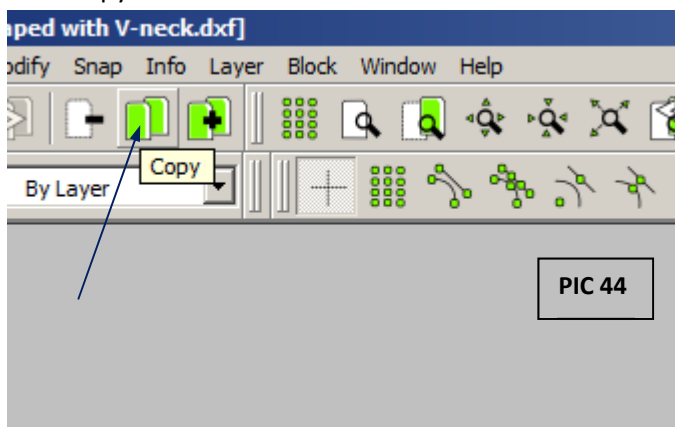


Hide all layers in drawing "Cut Sweater Man shaped with V-neck.dxf". Then show layer "printline" and layer "0"

Result:

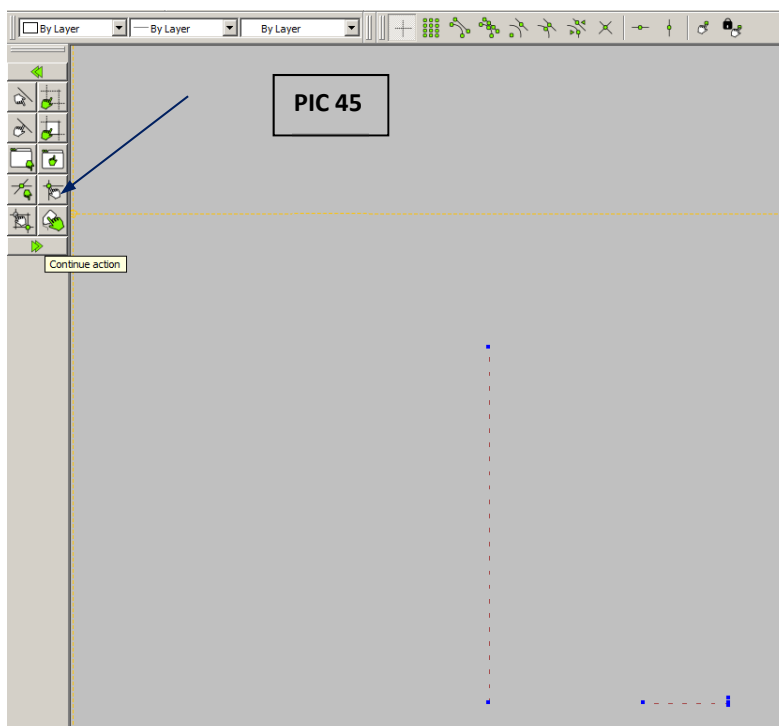


Now Copy:



Select to copy: select window

Select the left printline and the left horizontal and small vertical black line with the window. We have finished selection. Therefore "Continue Action".



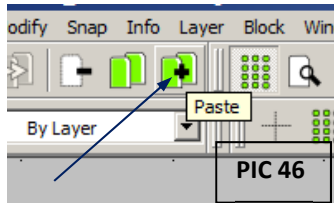
Show layer base-lines

Specify reference point: activate ONLY “snap on endpoints”. Snap endpoint of center vertical base-line on bottom. Click.

Now the selected parts with the chosen reference-point are stored in the clipboard.

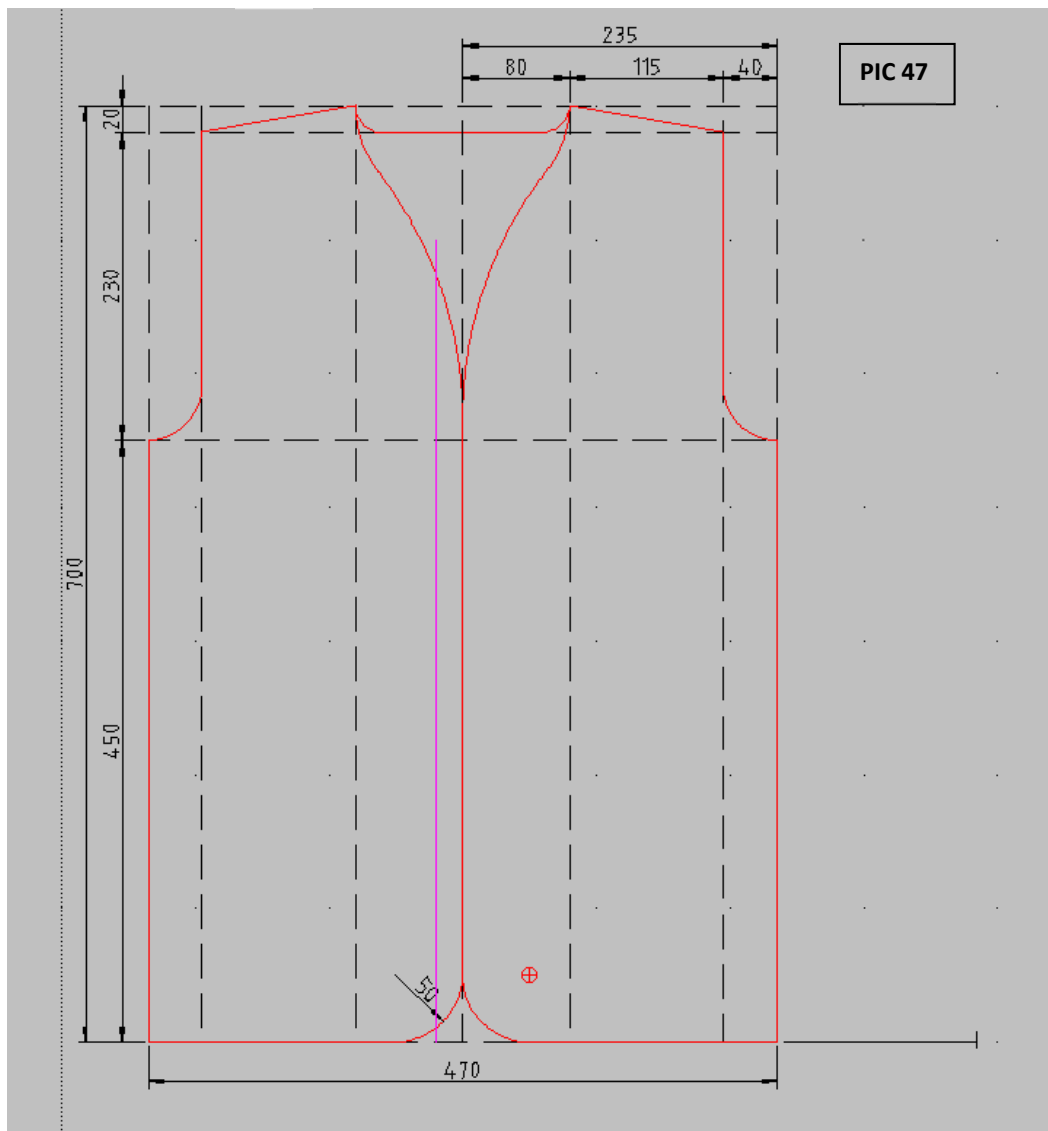
We change the drawings:” Window”, click on “Cut Cardigan Woman double_round neck.dxf”

“Paste”



Set reference point: activate ONLY snap endpoint . Chose vertical center baseline on bottom. Click.

Result:



Trim the printline on top to the horizontal base-line.

Remember: “Modify”, “Trim”....

We have copied now parts from one drawing to another drawing on distinct reference points.

We repeat this and copy a row-ruler, let us say we need row-ruler 39.

Remember: You can download all Row-Rulers from our BOX <https://www.box.com/s/jnirwnj210muxjxstd6>

“File”, “Open”,, Folder “Row Rulers”, R30_39.dxf

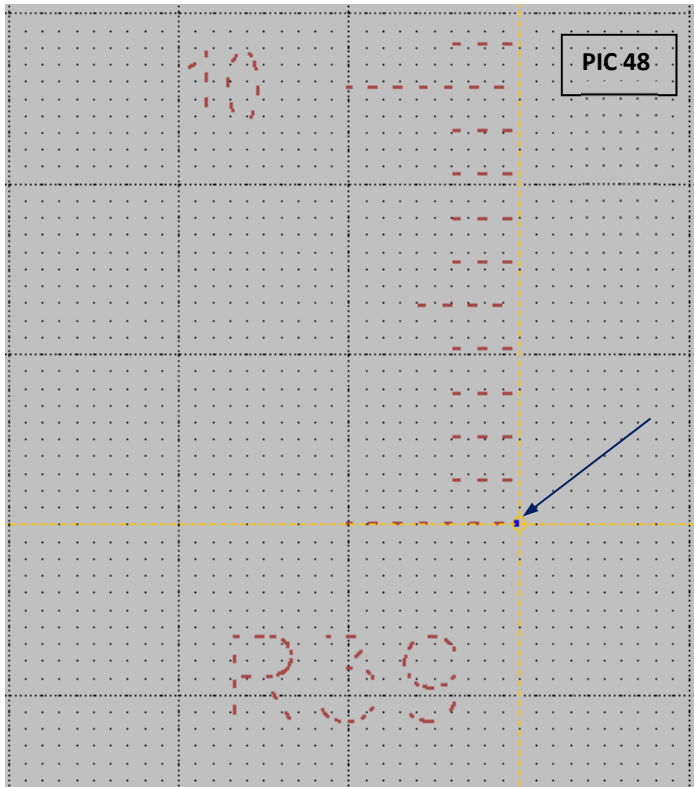
You see all Row-Rulers from 30-39. We want R39.

“Copy”

Select to copy: Click somewhere to “R39” (R39 is a block, all items of it are activated now)

“Continue Action” (selection is finished)

Specify reference point: roll your mousewheel, click mousewheel and move the mouse, until you have a View as pic 48. To be sure to select the correct point. Activate ONLY “snap endpoint”

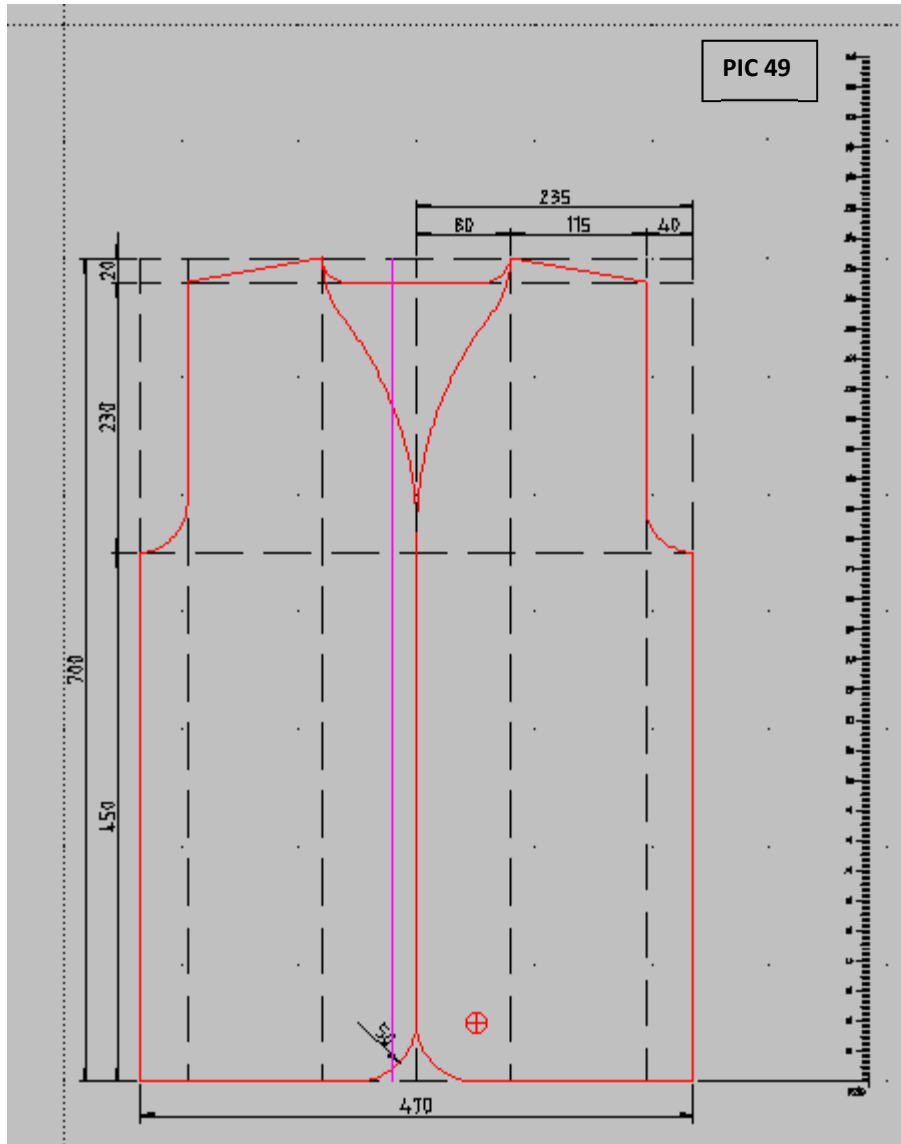


Click to the endpoint. “R39” is saved in the clipboard.

“Window”, “Cut Cardigan Woman double_round neck.dxf”

“Paste”, “snap ONLY “intersection”, zoom with mouse-wheel and click to the intersection point.

Result:



Now you are ready to print and knit (Remember the steps of Lesson 1, page 28)

A lot of the recent steps are not necessary for you to do in future, as you will take an existing drawing and just modify it to a new drawing. But to do the steps is necessary to learn the use of the CAD-system.

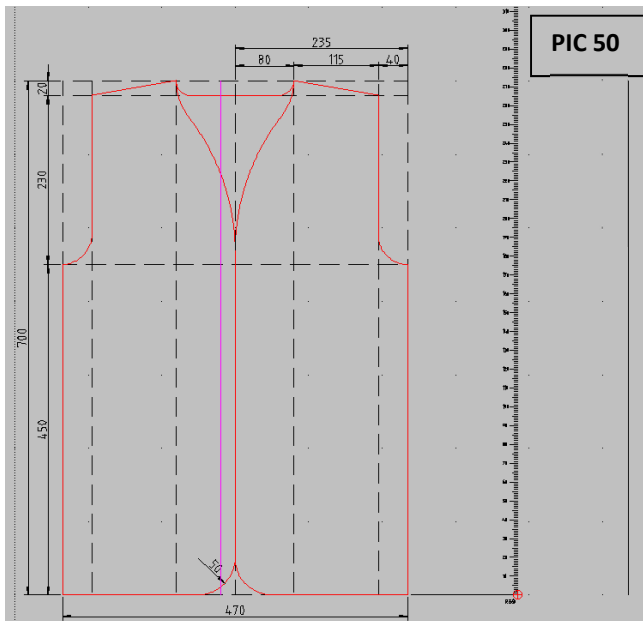
In the next step we draw a sleeve.

SLEEVE

Activate Layer "0".

Lines>parallel>distance 300. Orientation right vertical line of the body> Click

We need this line just as helpline to have a start-point for the sleeve



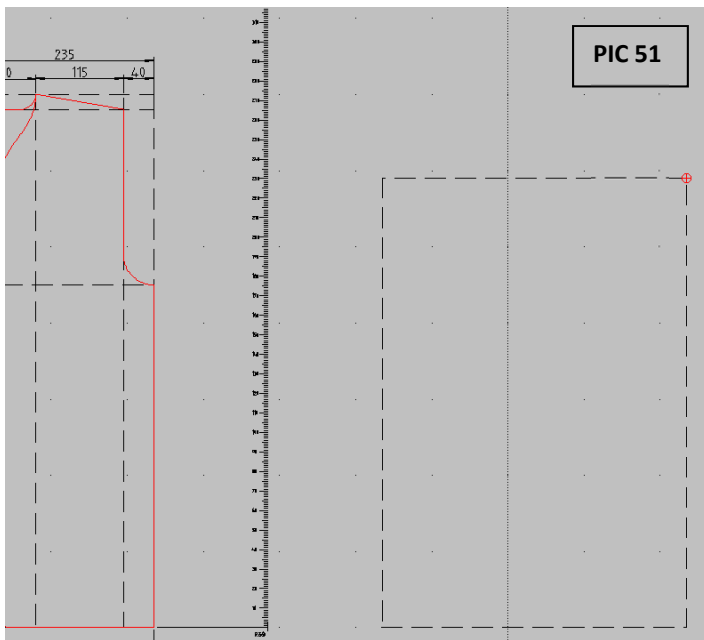
Activate Layer "Base lines"

Lines>Rectangles>"Snap on Endpoint"

Specify first corner: snap downer endpoint of the helpline

Specify second corner: activate command line>@400,590

Delete the helpline



Horizontal lines:

Lines>parallel>distance 150

Lines>parallel>15

Vertical lines:

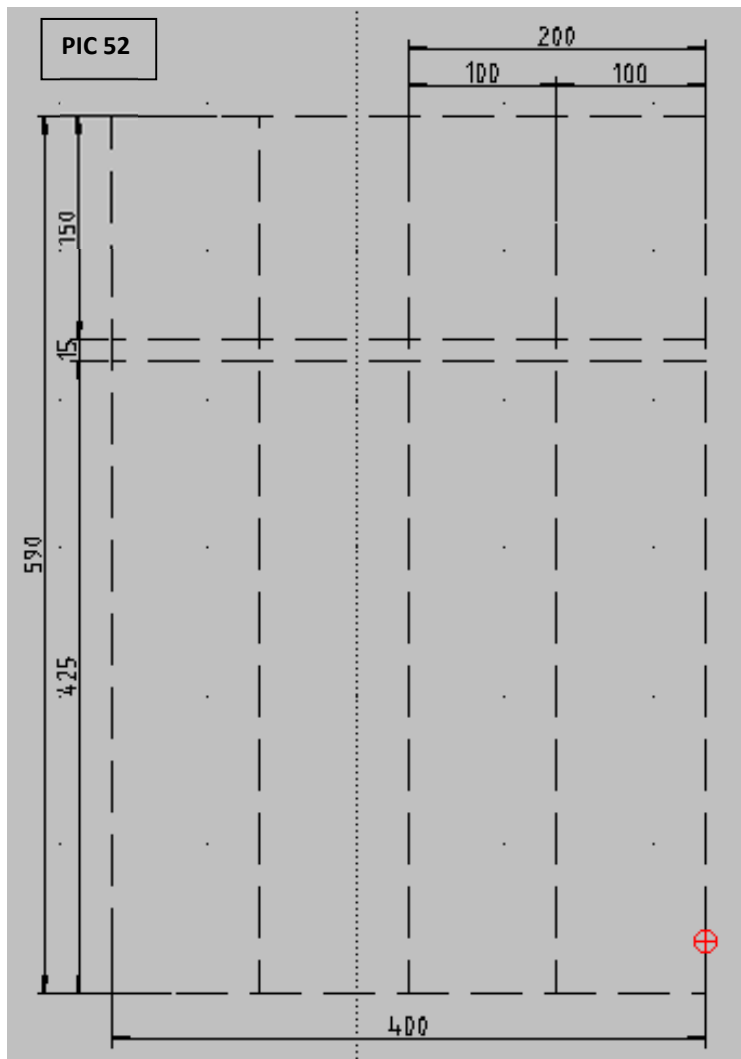
Lines>parallel>distance 200

Lines>parallel>distance 100

Activate layer "Dimensions"

Dimensioning (see Pic38 +39). Try snap "Entity"

Result:



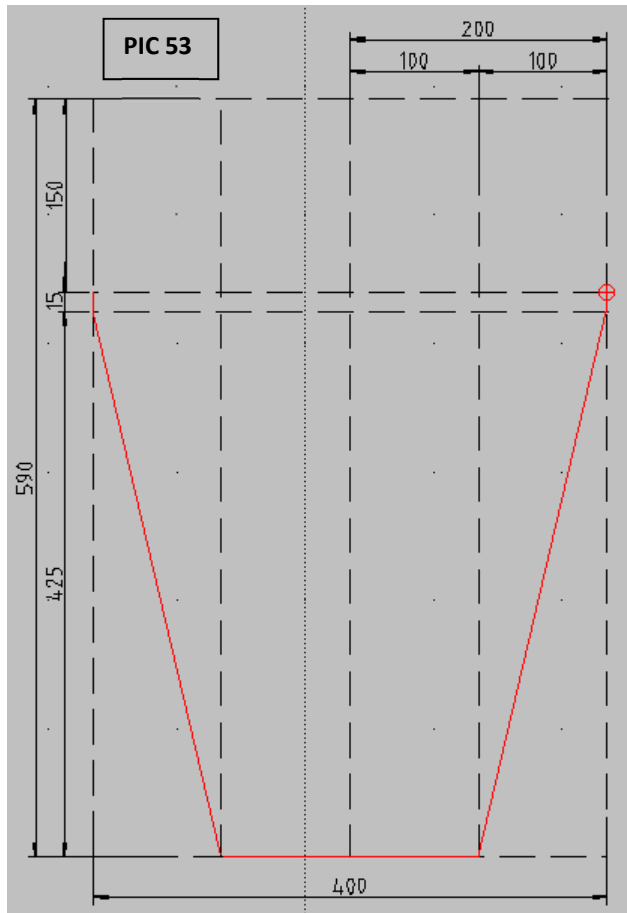
Activate layer "Contour"

Activate snap "Endpoint" and/or "Intersection". Try snaps for your best result. Zoom with the mouse-wheel before you set the point.

Lines>Line with two points>

Draw lines.

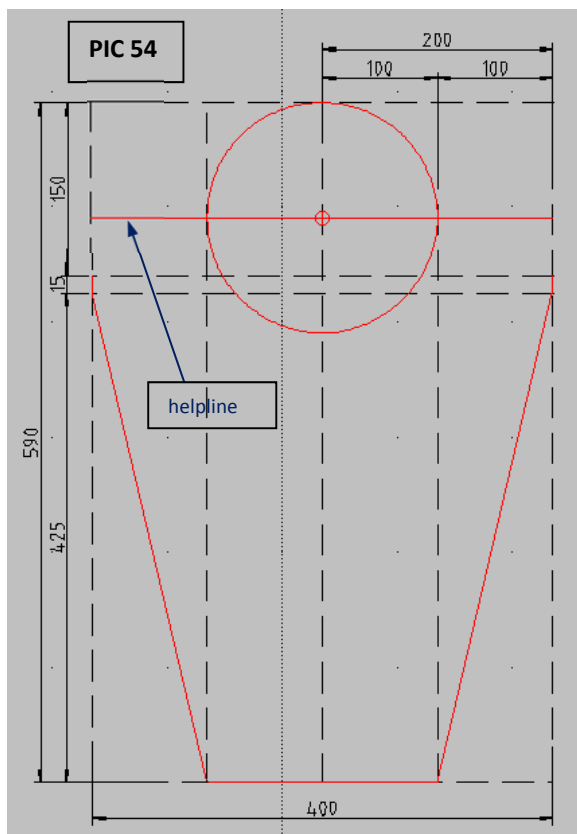
Result:



Lines>parallel>Distance: 100(helperline)

Circle>Circle with center and radius>radius: 100

Result:

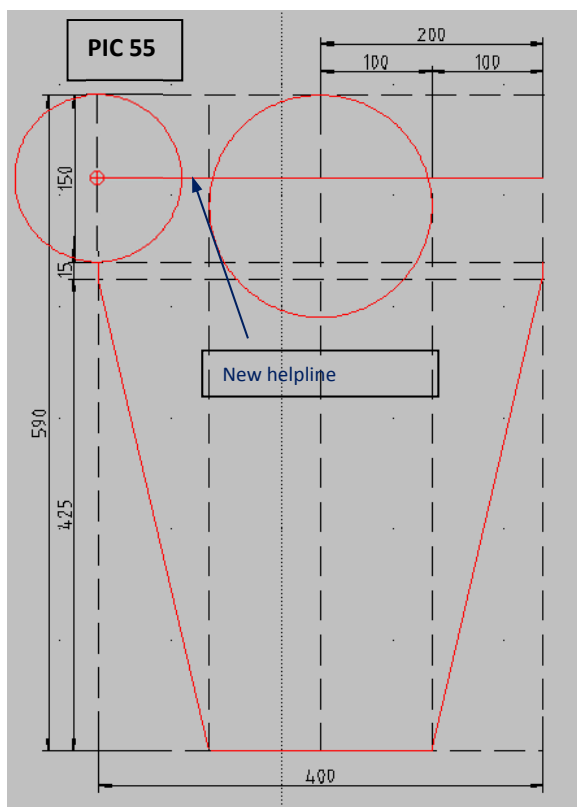


Delete the helpline

Lines>parallel>Distance: 75 (new helpline)

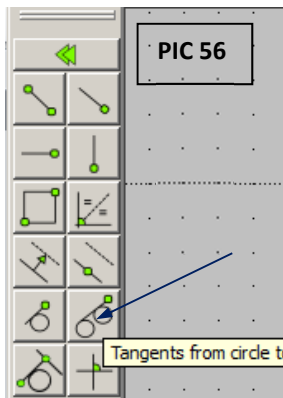
Circle>Circle with center and radius>radius: 75

Result:



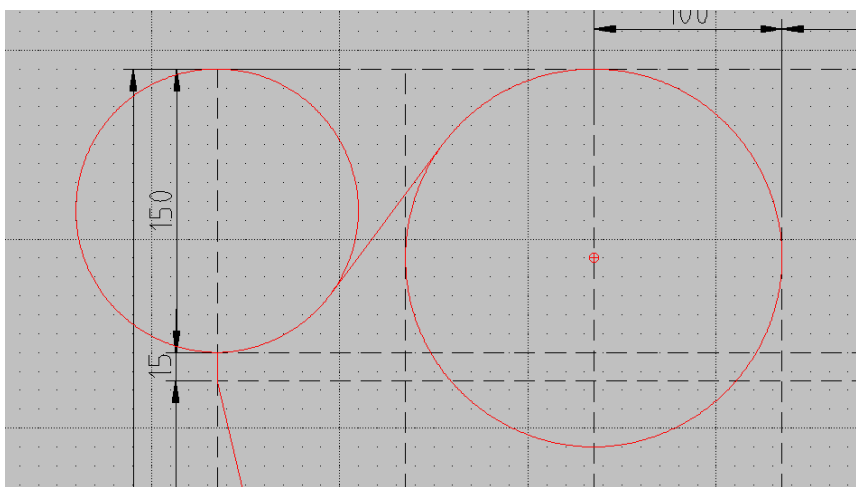
Tangent

Lines>Tangents from circle to Circles



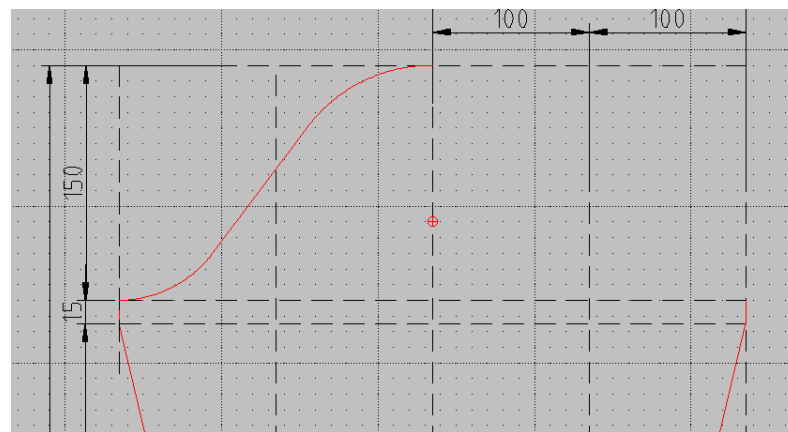
Select first circle or ellipse, Select second circle or ellipse

Result:



Trim all needed parts

Result:



The 'left side is finished. We mirror the left side.

MIRROR

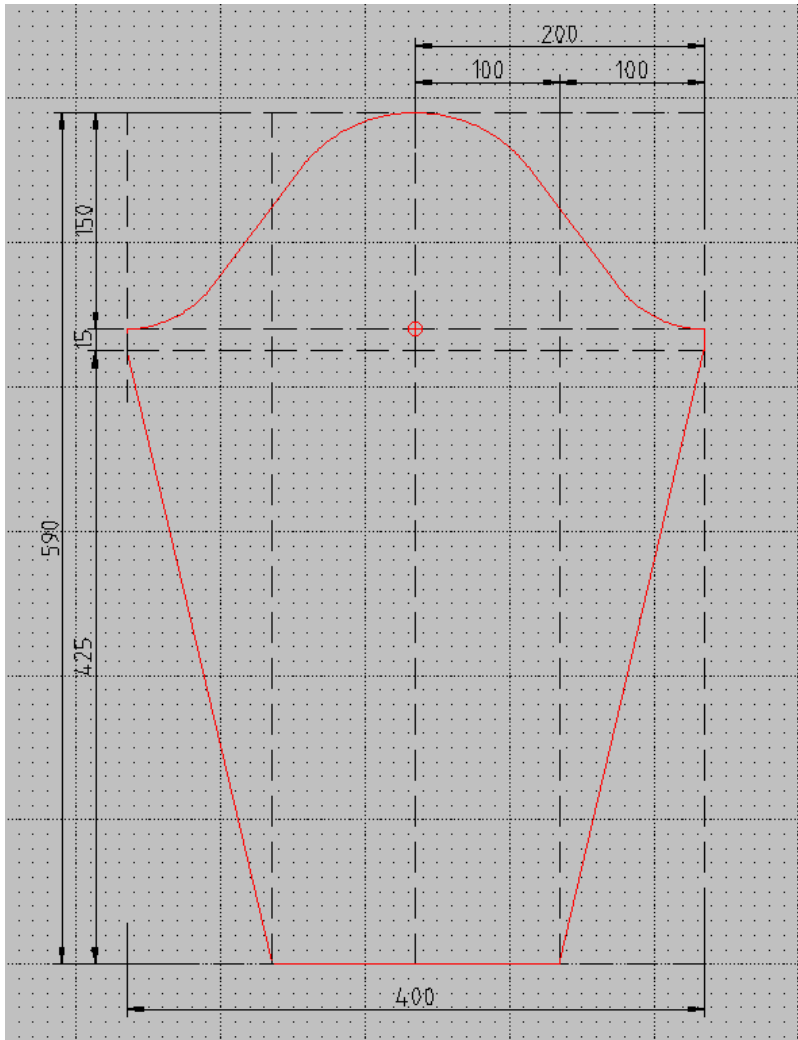
"Modify">"Mirror">select the three parts of the curve>"Continue action" to finish the selection

"Specify first point of mirror line": select the center baseline somewhere

"Specify second point of mirror line": select the center baseline somewhere

"Keep original"

Result:



Now we copy the print-line and the row-ruler:

Modify>Move/Copy>select print-line and row-ruler>continue action

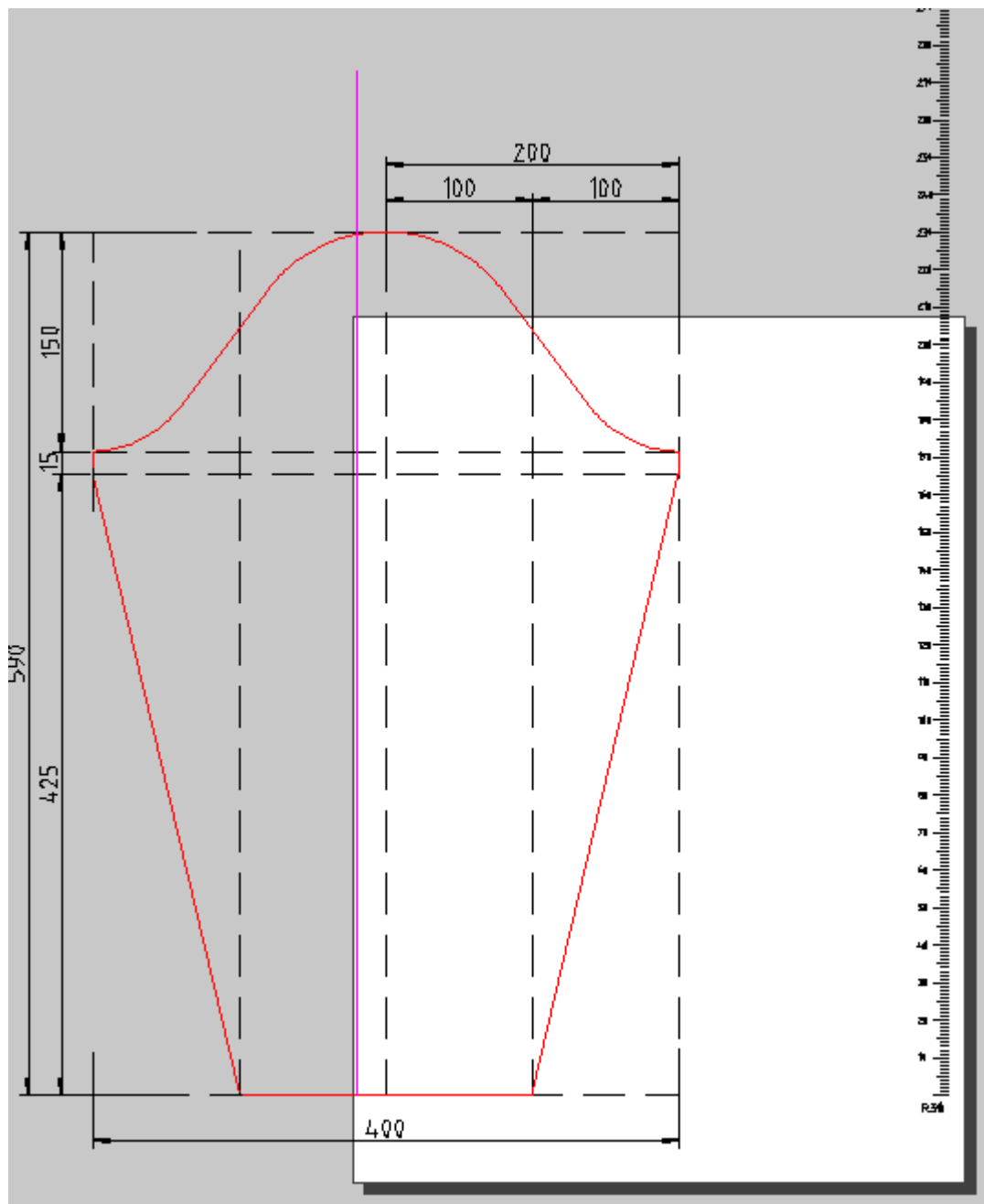
Snap ONLY "intersection"

Specify reference point: down end of the vertical center base-line **of the body**

Specify target point: down end of the vertical center base-line **of the sleeve**

Keep original

The Sleeve is finished. Print as shown in Lesson 1 page 28



Finish of Lesson 1

CONGRATULATION. You know now most of the needed commands. Next lessons are much easier!

Remember: One drawing can be used for all kinds of wool, for all mesh-sizes that your machines allows. Just activate the needed Row Ruler and print out. This needs 1 minute.

To learn the use of a knitting machine is much more complicate!!!!

If your drawing –against expectation- should be incomplete or incorrect you can download a complete and correct drawing here: <https://app.box.com/s/l3n3hy206uamgdor5idh>

HAVE FUN!