

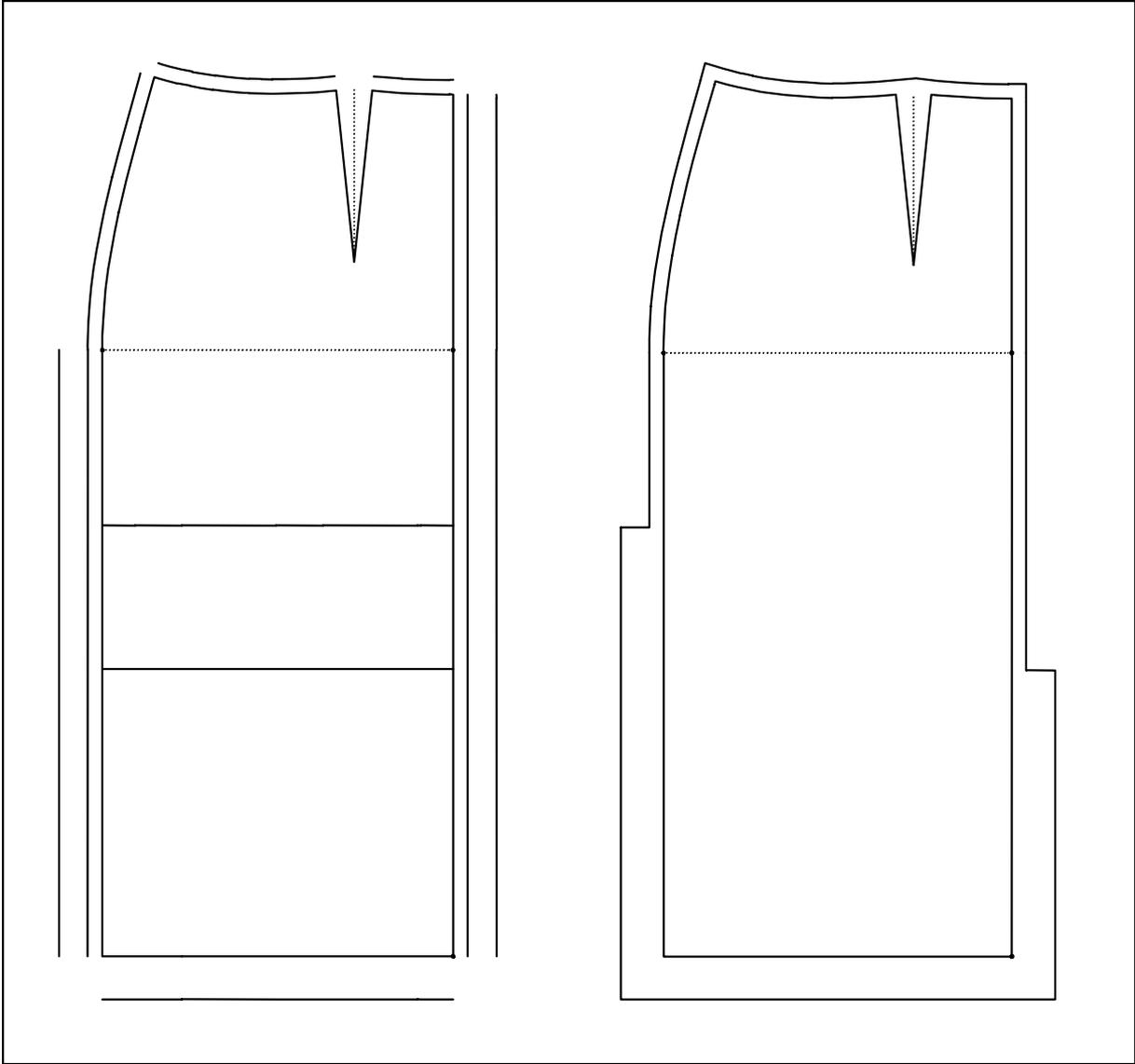
Chapter 4 „Create and alter perimeter“

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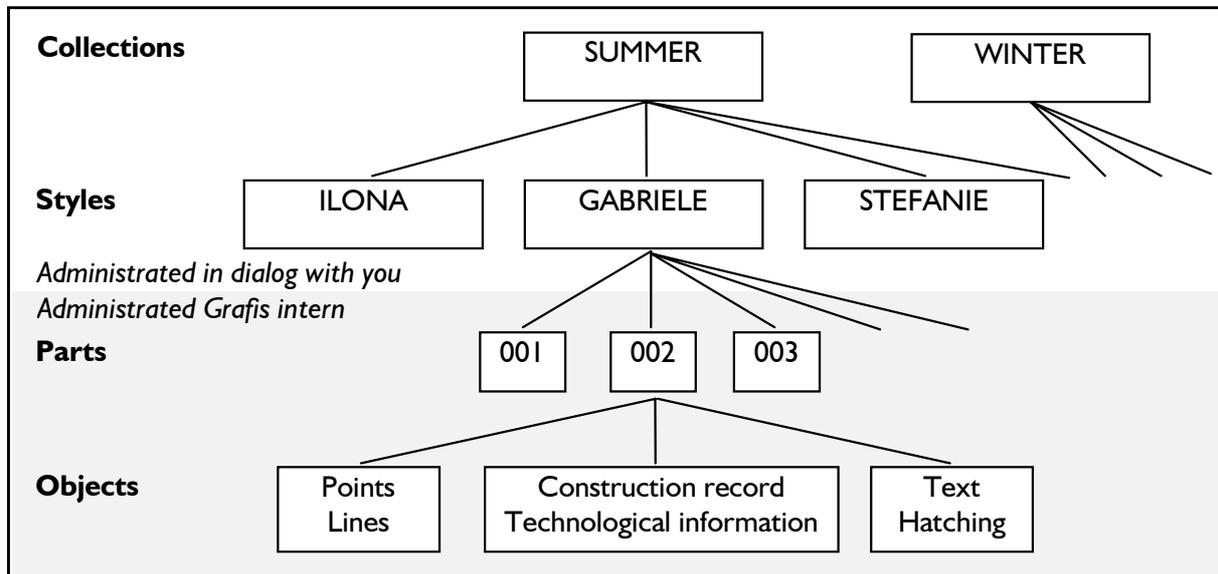
First you will learn to open, save and delete styles as well as creating and deleting collections. The follow-

ing sections deal with valuable information about the construction record and geometrical basics. Subject of the fourth to sixth section are deleting objects, construction of parallels and treatment of corners. Please use the exercises to learn all the new functions in this chapter. Follow the instructions in the text. By the end of this chapter you will be able to construct the depicted seam allowance and vent.



4.1 Work with collections and styles

The data structure



Picture 4-1

In Grafis construction data is organised according to collections, styles and parts (picture 4-1). The number of collections and styles is unlimited; nevertheless, styles which are no longer needed should be removed to disk or CD-Rom or deleted.

It is important for your work to know which styles are saved under which collection. Create an overview list for yourself.



Each style can contain up to 500 parts which will be named by Grafis with a 3-digit number. The parts consist of objects, e.g. points, lines and texts.

The menu for work with collections is opened automatically after having selected the construction system or via *File | Open*.

Öffnen eines Modells

In Grafis, there are two options to start work with a style from the start menu (picture 1-4):

1. Opening a new style
 - ⇒ Select the drive and collection in which the new style is to be created.
 - ⇒ In case the required collection does not yet exist, create it with .
 - ⇒ Enter the name for the new style in the “File name” dialogue box.

Note: You can also click an existing style and change its name.

2. Opening an existing style
 - ⇒ Select the drive and collection under which the style is saved.
 - ⇒ Double-click on the required style. Alternatively, you can select the required style and open it with *Open*.

Saving a style

To save a style select either *Save* or *save As..* from the *File* pull-down menu.

Save saves the style under its current name after a security question.

Save As... saves the style under a new name and/or in a different collection or on a different drive. The remaining steps are analogous to “Opening a new style”.

After saving, you can resume work with your style by clicking  or open a new style via *File | Close* and *File | Open*.

Closing a style

To end work with a style select the function *Close* from the *File* pull-down menu. With a security question you decide whether or not the style is to be saved. If the security question is answered “No” the changes to the style are not saved.

Creating a new collection

Select the drive on which the new collection is to be

created. If necessary, use  to switch to the col-

lections level and create the new collection with .

Deleting styles and collections

The ‚Open style‘ dialogue (Picture I-4) also permits deletion of collections and styles. Select the collec-

tion or style to be deleted and click on . After a security prompt the style or the collection with all its styles is deleted.

Note: If Grafis cannot delete the collection, there is still some data left in the respective directory (collection = directory/folder).

Regular data securing of your collections and styles to floppy disks, streamers or others is recommended. This is the only way of restoring your data in case of a defective harddisk for example.

4.2 The construction record

Purpose of the construction record

Grafis saves the construction and modification steps during pattern development in the base size by imperceptibly writing a record. The operator has the option of calling the construction record with other measurement charts and thus, create a similar construction for these sizes. Incremental grading is omitted.

The construction record is similar to the notepad of an attentive student who notes down each of the teacher’s steps and can then recreate the construction with different measurements.

Indication of record steps, test run

The number of recorded construction steps is constantly indicated in the basic menu in Grafis with two blocks of digits with three numbers each (see menu below *test run*). The right block indicates the number of construction steps recorded so far. The left

| |
|-------------|
| |
| N*reset |
| N= 1 |
| test run |
| 000 000 |
| grading |
| partorganis |
| call |

group of numbers indicates the record step at which *test run* was last activated.

Test run starts the run through the construction record. It can also be run in a step-by-step mode. After having selected *test run* press the <S> key once. Pressing the space key in step-by-step mode will show the next construction step. Press <S> again to quit the step-by-step mode.

Reset the construction record

The construction record can be reset by N steps via *N*reset*. N is set to 1 by default. Therefore, clicking *N*reset* resets the record by 1 step. To reset a number of steps click on the line *N= 1* and enter the number of steps to be reset. The construction record is automatically reset although nothing has changed on screen, yet. The current state is shown after clicking *test run*.



As soon as you detect a mistake in your construction, reset the construction record back to the error and resume construction without the mistake. Please do not try to “patch up” your construction as following construction steps may be affected inadvertently. Correcting mistakes in time avoids errors during automatic construction (grading).

Analogous to knitting: Reset, even if it hurts!

Exercise

Call the basic block “Grafis Skirt 20”, click on *N*reset* and activate *test run*. The screen is empty as calling a basic block already counts as a construction step. You can now call a different basic block. This is the quickest way to view various basic blocks.

Call two more basic blocks, resetting the record by one step each time. Activating *test run* is not necessary as a test run ensues automatically before starting a record function. All functions of the basic menu from *call* onwards are record functions. They are recorded internally in the system.

4.3 Geometrical basics

The co-ordinate system

The co-ordinate system is used for the description of point positions on a plain. In clothing construction the plain is comparable to the paper on which the pattern is designed.

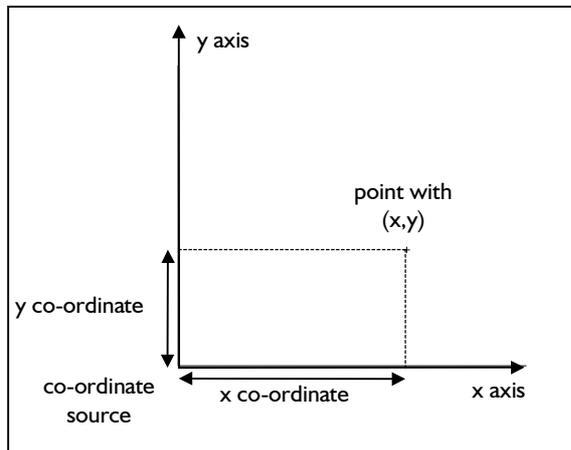
All points on the plain relate to an agreed source (a starting point). The x and y axis run through this point in a right angle towards one another. Unless otherwise stated, the x axis runs horizontally, the y axis vertically (picture 4-2).

An example for a different presentation in a co-ordinate system is the Dow Jones Index diagram. You know these diagrams from the stock market reports. In this case the x axis is a time axis and along the y axis the Dow Jones value is registered. A point in this co-ordinate system assigns a certain point in time with a certain Dow Jones value.



X and y co-ordinates of a point

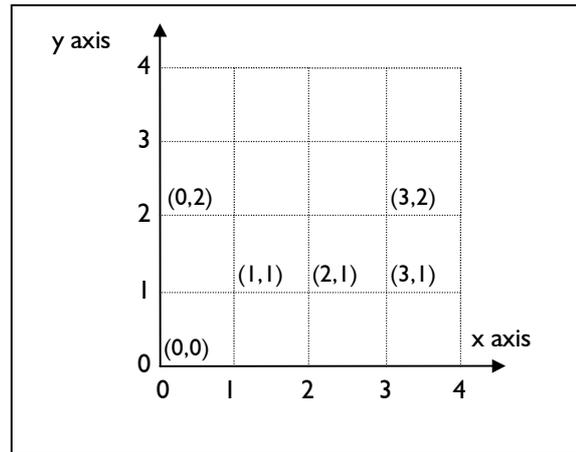
The position of a point is clearly defined by its distance to the x and y axis. The distance to the y axis is the x co-ordinate of the point, the distance to the x axis is the y co-ordinate of the point (see picture 4-2).



Picture 4-2

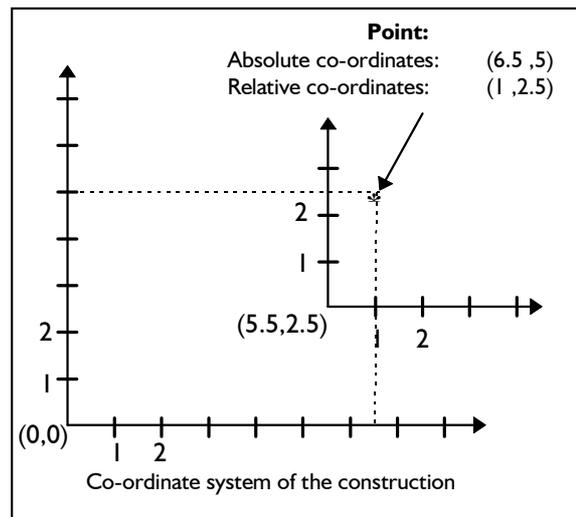
A minus in front of the x co-ordinate places the point to the left of the y axis. The y co-ordinate is negative if the point lies below the x axis. A point is clearly defined by stating (x,y) (picture 4-2).

Picture 4-3 shows a few points and their respective co-ordinates.



Picture 4-3

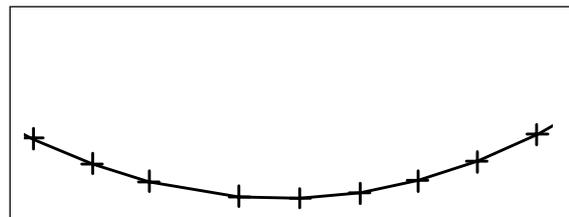
The position of a point can also be defined **relative** to another point in the construction. In picture 4-4 the new point of reference is point (5.5,2.5). The absolute co-ordinates of the point result from its relative co-ordinates and the co-ordinates of the point of reference.



Picture 4-4

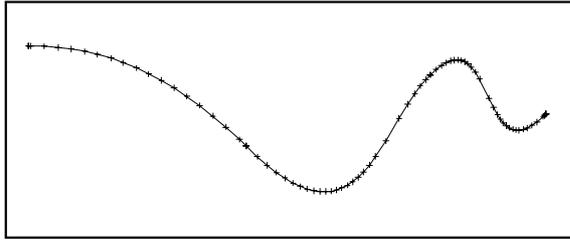
Polygon

All lines, circle arcs and curves are displayed as polygons in Grafis. A polygon consists of a number of points connected by straight lines (picture 4-5). As a rule, the fulcrums of the polygon are not visible.



Picture 4-5

With the function *raster0* (section 5.3) they can be made visible as points if necessary.

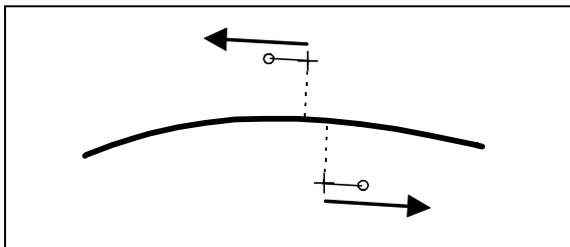
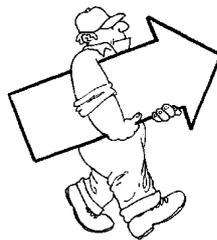


Picture 4-6

The fulcrums of a circle arc have the same distance between one another. The fulcrums of a curve are denser in the bends (picture 4-6).

The right principle

For certain construction steps the beginning and end of a line have to be determined. The line receives a direction. For this purpose the right principle was introduced. Grafis supports the operator with the so-called “right principle cursor” which also contains the direction indicator (picture 4-7).



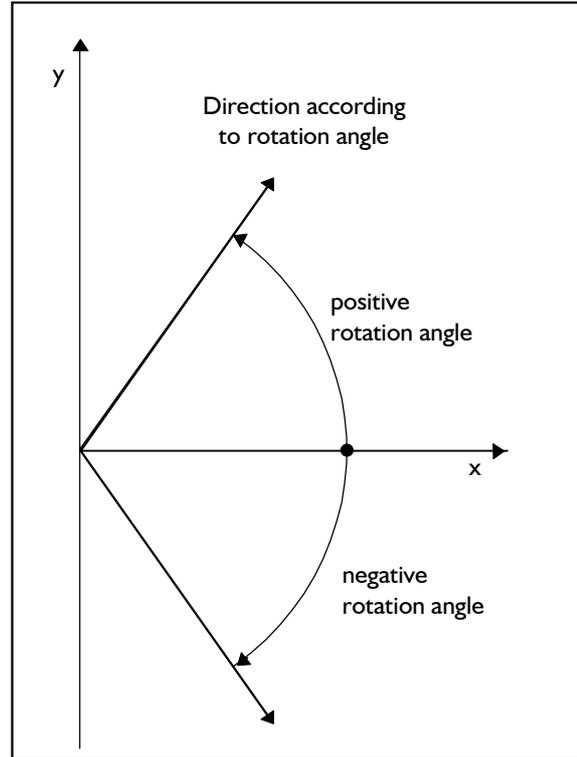
Picture 4-7

To illustrate the right principle imagine the line/curve to be clicked as the central reservation of a road. The required direction of travel is communicated to the system by clicking the line. (Relates to driving on the right side of the road, only.) The right principle and its application is explained in detail in the chapters 4.5 and 5.2.

Angle definition

Definition of angles are required for rotation transformations, determination of direction in certain curve points or construction of lines. The following rules apply (picture 4-8):

1. The definition of angles ensues from the positive x axis - if no other reference is present. This agreement is important for definition of points through their distance to the source and their direction.
2. A positive rotation angle creates anti-clockwise rotation, a negative angle results in clockwise rotation.



Picture 4-8

4.4 Deleting objects

The delete menu

The delete menu is activated via *Basic menu | delete*. Single objects (points, lines/curves, hatching, texts) can be deleted by clicking; several objects within a rectangle to be drawn up can be deleted in one operation.

Step-by-step guide

- ⇒ Activate the object type to be deleted under the required option (*single or rectangle*)
- ⇒ Click the objects or draw up rectangle

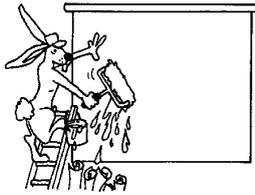
The option single

To delete individual objects the type of objects under *single*: is to be activated and the object to be deleted is to be clicked. This is the object nearest to the cursor, marked by a fine thread and coloration.

| |
|------------|
| delete |
| single: |
| points |
| lines |
| hatchings |
| texts |
| rectangle: |
| points |
| lines |
| texts |
| all |
| reset |

The option *rectangle*

To delete several objects in one operation first, the type of object is to be selected under *rectangle*: All objects of this type **completely** lying within a rectangle to be drawn up will be deleted. The rectangle is drawn up by clicking  the corner of the area to be deleted, moving the mouse and clicking  the opposite corner.



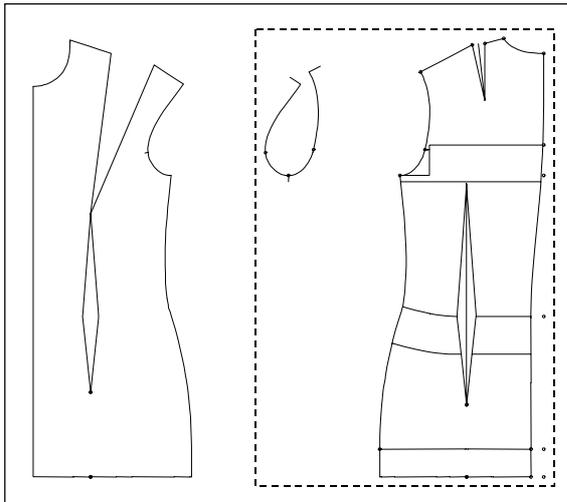
When deleting several objects the objects lying completely within the rectangle are deleted only!

With *reset* you can reset the last deletion step.

Please note that deleting is a construction step and will be performed automatically during *test run* or *grading*. Start both function from the basic menu. One or more deletion steps can also be reset by resetting the construction record.

Exercise on deleting

Call the basic block „Grafis Bodice 10“ and delete all dashed lines and all points in the front individually.



Picture 4-9

Click  the point or the line to be deleted. A fine thread to the cursor indicates the nearest point.

If a different point is deleted, the thread cursor did not indicate the point to be deleted. If a different object is deleted, a different type of object was active. To correct click  *reset* and repeat deleting.

Delete all lines and points of the back and armhole with *rectangle: all* (Picture 4-9).

Click a corner of the area and move the mouse. A rectangle opens that you can draw up as shown. Click  and the points within the rectangle are deleted. If different points are deleted you opened the rectangle over a different area. To correct click *reset* and repeat the steps.

Exercises

1st Exercise

Call the basic block „Grafis Skirt 20“ and delete

- all points in the skirt front
- *reset*
- all lines in the skirt back
- *reset*
- the complete skirt front
- *reset*
- the complete skirt back.

Reset the construction record to 000 in the basic menu.

2nd Exercise

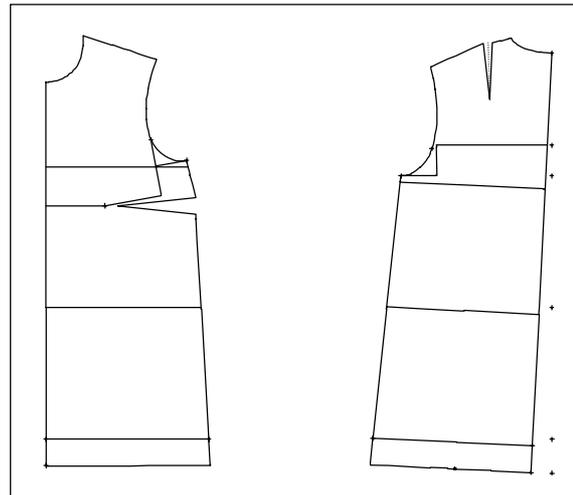
Call the basic block „Grafis Bodice 10“ and delete the complete back. Centre the front with <F6> on the screen.

3rd Exercise

As opposed to the 2nd exercise, now delete the whole front and centre the back on screen.

4th Exercise

Call the style „Shirt blouse“ from Chapter 2 Section 5 and delete individual lines and points. Then, reset the record and delete all lines of the front and all points of the back.



Picture 4-10

4.5 Parallel

Application of parallels

Parallels are significant for the construction of

- overlap and button catch
- turn-ups on jackets, coats and trousers
- seam allowances and hem
- and others.

The *parallel* menu

The construction of parallels ensues with the *parallel* menu which is opened from the basic menu.

Step-by-step guide

- ⇒ Select distance or enter special distance value in the line $d=.....$
- ⇒ Activate or deactivate *chain*
- ⇒ Select *+/-copy*
- ⇒ Click the line/curve to which a parallel is to be generated.

Determine distance value

If the required distance (in millimetres) is given in the menu with $d:$ click the respective line. Otherwise a specific value has to be entered in $d=$ by clicking, entry and <ENTER>. The point is the decimal sign. An entered distance value can be reactivated by clicking the line “^ ^ ^ ^ ^ ^” below $d=.....$

| parallel |
|-------------|
| d : 5. |
| : 7.5 |
| : 10. |
| : 12.5 |
| : 15. |
| : 20. |
| : 25. |
| : 30. |
| : 35. |
| : 40. |
| : 50. |
| d = 60. |
| ^ ^ ^ ^ ^ ^ |
| chain |
| + copy |
| reset |
| measure |

Significance of chain and *+/-copy*

If *chain* is active (highlighted in red) the parallel is generated not for the clicked line/curve, only but for all connected lines and curves. Clicking *chain* activates or deactivates this option.

The switch *+/-copy* determines whether the original line remains existent (*+copy*) or not existent (*-copy*). Toggle by clicking the line.

Direction for parallel generation

Clicking decides on which side of a line/curve the parallel is generated. The parallel is generated in the direction from which the line/curve is clicked. Therefore, click **next to** the line and not on the line! Attention! If identical objects are lying on top of each other 2, 4 or 6,... times they cannot be seen on screen as they delete their respective image. If they lie on top of each other 3, 5,... times they are visible. When practising the parallel function for the first time this is a common mistake. After <F4> even objects deleting each other's image are displayed. If you cannot see a new parallel straight away, press <F4>. Make sure that points or lines are never

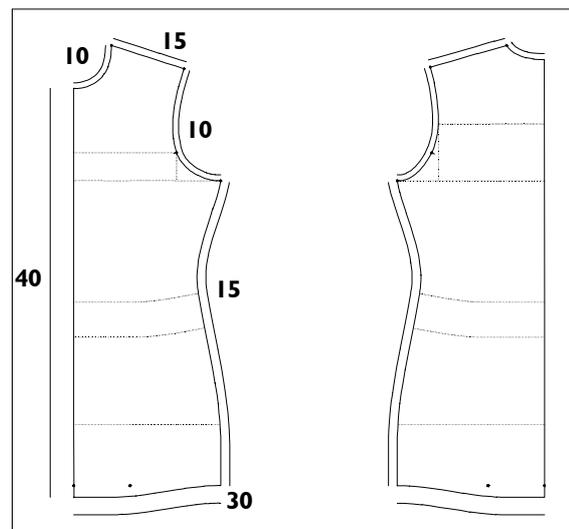
placed on top of one another by using reset or delete.

With *measure* functions for measuring distances, lengths and directions for example can be called. These functions are explained in chapter 9.

Exercise on creating parallels to single lines

Call the basic block „Grafis Bodice 20“ and construct the seam allowances displayed (Picture 4-11):

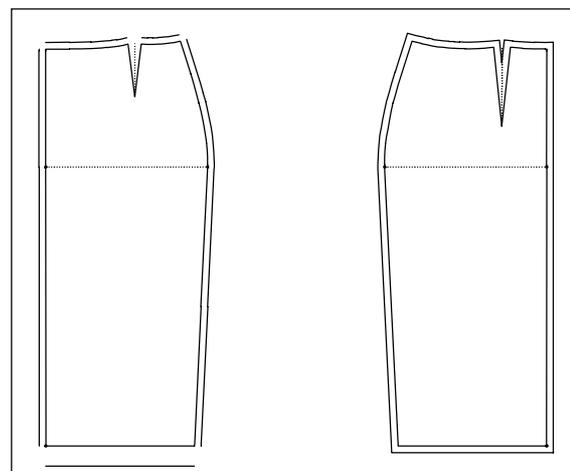
- neck and armhole: 10mm,
- shoulder and side seam: 15mm,
- hem 30mm
- overlap centre front 40mm.



Picture 4-11

Exercise on creating parallels with chain

Call the basic block „Grafis Skirt 20“ and construct a parallel of 10mm to the complete perimeter of the skirt back (Picture 4-12). Activate *chain*. Construct a single parallel of 10mm or 30mm at the hem of the front skirt. First, deactivate *chain*.

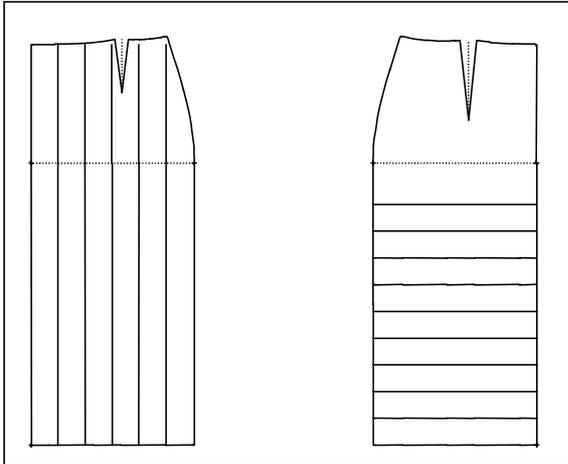


Picture 4-12

Exercises

1st Exercise

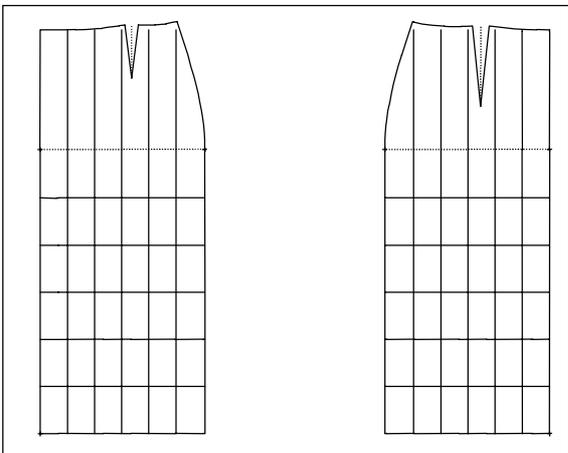
Call the style „Straigh skirt“ from Chapter 2 Section 2.4 and create parallels at a distance of 40mm from the centre front and further parallels at a distance of 40mm from the hem in the skirt back (Picture 4-13).



Picture 4-13

2nd Exercise

Call the style „Straigh skirt“ from Chapter 2 Section 2.4 and create parallels at a distance of 40mm from centre front and centre back and further parallels of 70mm respectively from the hem (Picture 4-14).



Picture 4-14

4.6 Corners

The corners menu

The construction of corners ensues with the *corners* menu which can be called from the basic menu.

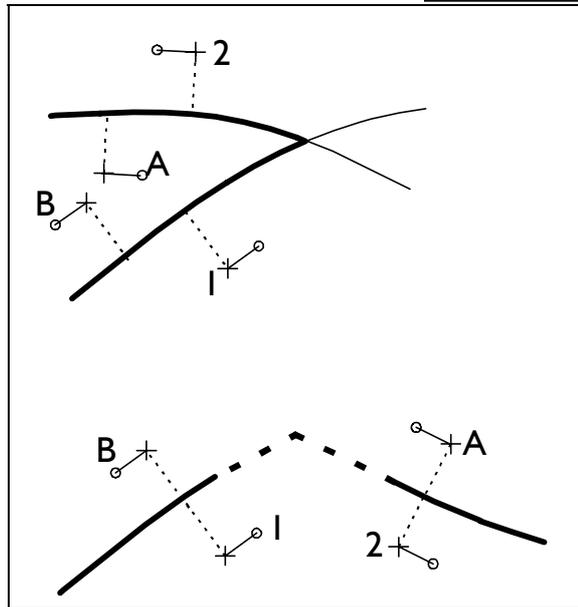
Step-by-step guide

- ⇒ Select the type of corner and enter the necessary values
- ⇒ Click two lines, following the right principle

Initial options

A corner is built of two lines/curves which do not need to intersect but may have more than one intersection. Before each corner construction the objects involved are lengthened (internally) by 500mm at beginning and end. Thus, corners outside the objects can be constructed (picture 4-15 lower example). If Grafis detects more than one corner on curves they are indicated and the one required has to be clicked.

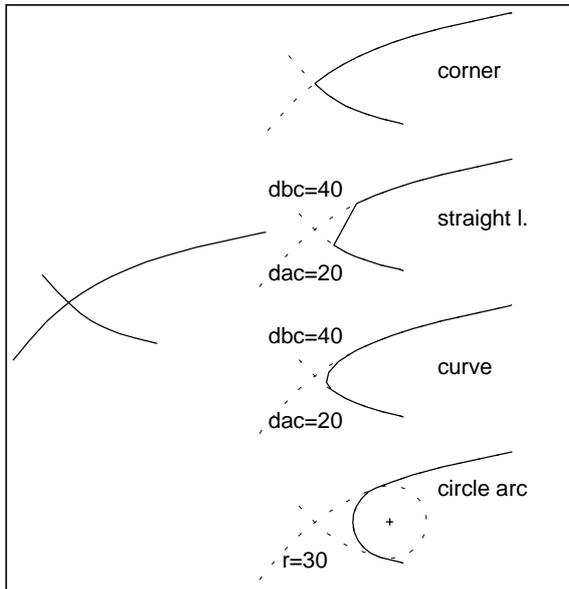
| corners | |
|-------------|--|
| corner | |
| straight l. | |
| dbc= 10. | |
| dac= 10. | |
| curve | |
| dbc= 10. | |
| dac= 10. | |
| circle arc | |
| r : 10. | |
| : 20. | |
| : 30. | |
| : 40. | |
| : 50. | |
| : 60. | |
| : 80. | |
| r= 15. | |
| reset | |
| measure | |



Picture 4-15

Types of corners and their parameters

In Grafis you can choose between four different types of corners (see picture 4-16).



Picture 4-16

The option *corner* creates a corner directly from the intersection of the two objects.

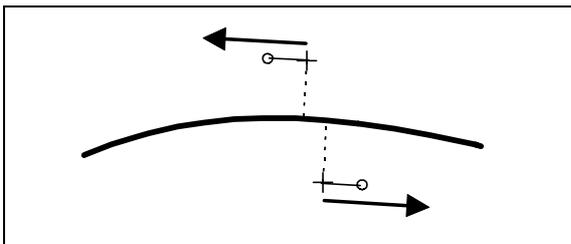
With *straight line* the corner is bridged by a straight line. The parameters *dbc* (distance before corner) and *dac* (distance after corner) have to be determined. The given distances are measured from the intersection along the objects and a straight line is constructed in between.

The corner type *curve* also requires the parameters *dbc* and *dac*. Instead of a straight line a curve is constructed to bridge the corner.

Circle arc constructs a circle into the corner with the radius given. The radius can be selected from pre-set values or entered into the line $r = \dots$. If no circle arc can be constructed for the defined corner Grafis refuses the construction.

The right principle

For the construction of corners the **right principle** must be followed when clicking the objects (picture 4-17).



Picture 4-17

With this principle not only the objects are determined when clicking the line/curve but a direction in

which the object is to be used for the instructed construction.

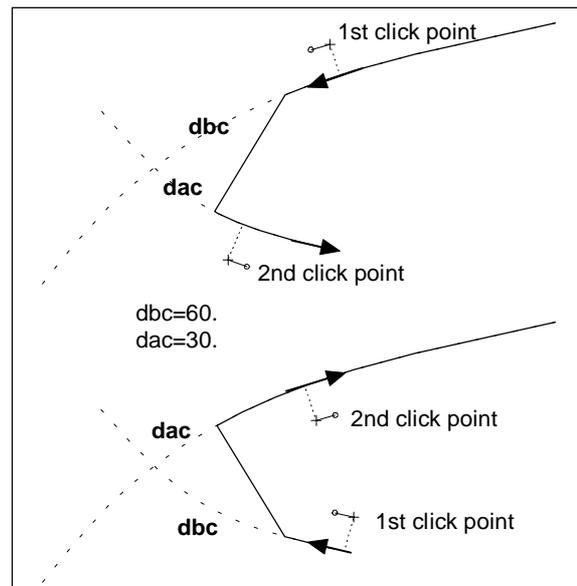
The first object is to be clicked so that you are driving towards the requested corner, the second click must be driving away from the corner (see picture 4-15, combinations A-B or 1-2).

The right principle is very powerful. Grafis supports the operator with the so called “right principle cursor” which also has the direction indicator (pictures 4-15 and 4-17).



For illustration of the right principle imagine the line/curve to be clicked as the central reservation of the motorway. The construction of corners resembles driving onto a motorway junction. You are driving along the first line towards the junction and then turn onto the second motorway. The direction of travel is determined by clicking the lines, following the right principle. The stretches of motorway you are driving remain existent, the others are deleted (see also picture 4-16). (This image relates to driving on the right side of the road, only.)

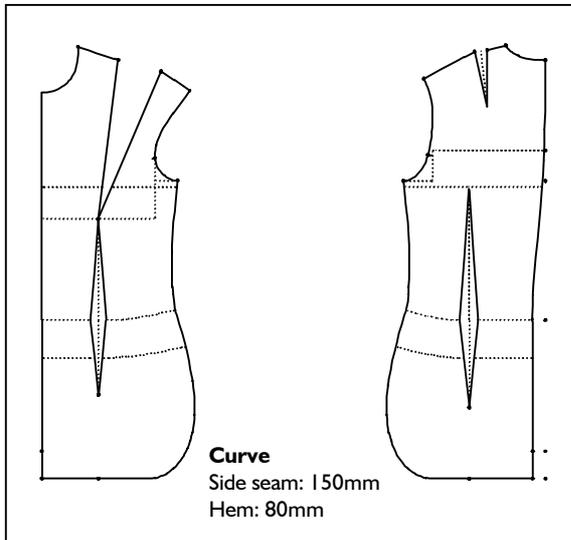
For the corner types *straight line* and *curve* the distance *dbc* (distance before corner) is measured along the first line and *dac* (distance after corner) along the second line respectively (picture 4-18).



Picture 4-18

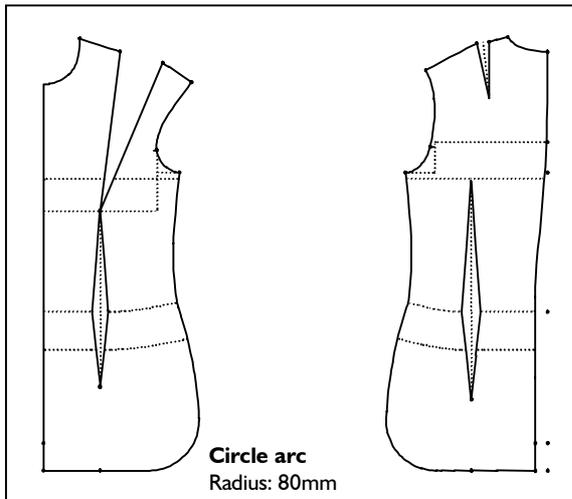
Exercise

Call the basic block „Grafis Bodice 10“ and create a rounded corner at the side seam/ hem (see Picture 4-19).



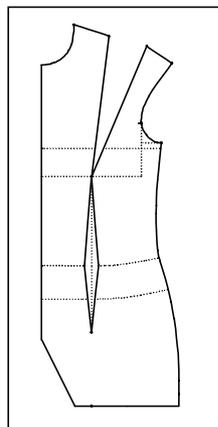
Picture 4-19

Repeat the exercise and create a rounded hem at the side seam as a circle arc with a radius of 80mm (Picture 4-20).



Picture 4-20

Repeat the exercise and create an angle at the centre front/ hem as a straight line (Picture 4-21). The straight line is to start 120mm along the centre front and end at 60mm along the hem.

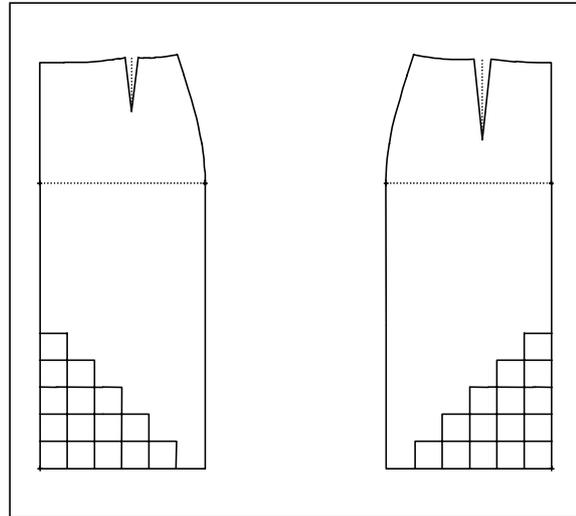


Picture 4-21

4.7 Exercises

1st Exercise

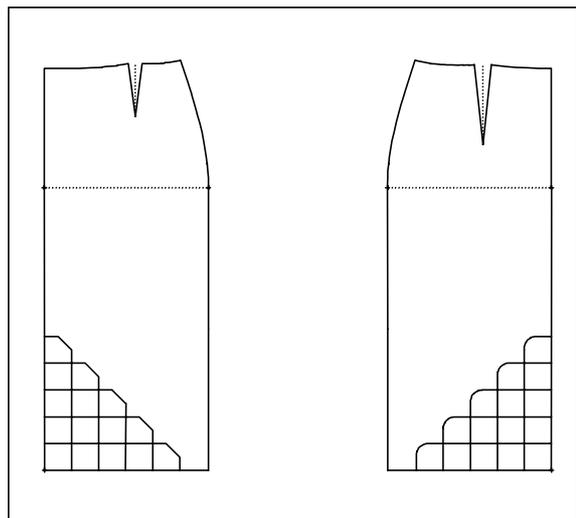
Call the style „Straight skirt“ from Chapter 2 Section 2.4 and create 5 parallels each to the centre front, centre back and the hem. Then, create the shown pattern with corners.



2nd Exercise

Call the style „Straight skirt“ from Chapter 2 Section 2.4 and create 5 parallels of 40mm each to the centre front, centre back and the hem. Then, create the shown pattern with corners.

In the front skirt the corners are created with the ‚straight line‘ corner option $dbc=dac=20mm$. In the back skirt the corners are created with the ‚curve‘ corner option and also $dbc=dac=20mm$.

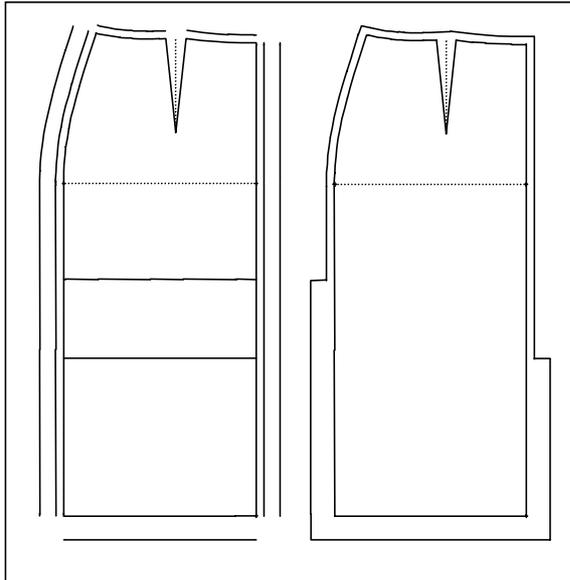


3rd Exercise

Call the style „Straight skirt“ from Chapter 2 Section 2.4, delete the skirt front and construct the following parallels:

- vent height centre back: 200mm
- vent height side seam: 300mm
- seam allowance waist, side seam and centre back: 10mm
- vent width: 30mm
- hem: 30mm

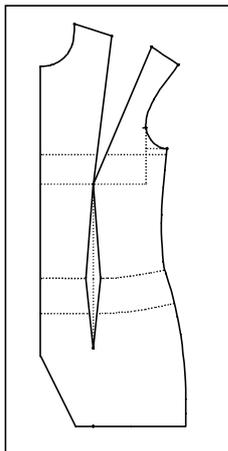
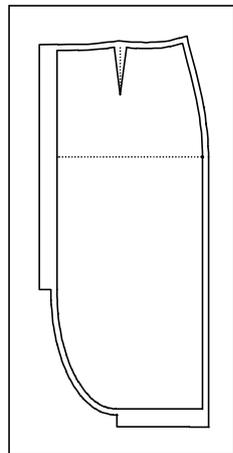
Close the corners and grade the skirt in various sizes.



4th Exercise

Call the style „Straight skirt“ from Chapter 2 Section 2.4, delete the skirt back and construct the skirt shown as in Exercise 3.

- Seam allowance 10mm
- rounded centre front/ hem: 200mm from hem and 100mm from centre front (CF)
- overlap centre front: 30mm



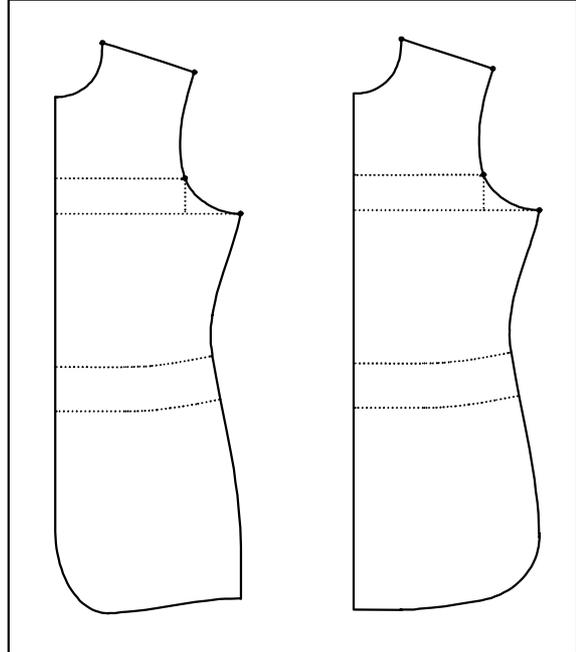
5th Exercise

Call the basic block „Grafis Bodice 10“, delete the back and construct an angle at the centre front/ hem. Use *corners with straight line*. The angle is to start 120mm along the centre front measured from the hem and end 60mm along the hem measured from the centre front.

6th Exercise

Call the basic block „Grafis Bodice 20“, delete the back, the armhole and the auxiliary lines and points in the hem area.

Construct a rounded corner beginning 120mm along the centre front measured from the hem and ending 75mm along the hem from the centre front.



Reset the previous rounded corner by resetting the construction record. Normally, only one step is to be reset.

Now construct a rounded corner at the side seam beginning 80mm from the hem and ending 80mm along the hem measured from the side seam.

7th Exercise

Call the style „Shirt blouse“ from Chapter 2 Section 2.5, delete the individual points of the centre back, auxiliary lines, the waist dart and the armhole. Construct the following parallels:

- in the front: 30mm overlap and 10mm seam allowance
- in the back: 10mm seam allowance with *chain*

Delete the seam allowance at the centre back and close the corners with *corners*.

