

Chapter 5 „Easy line functions“

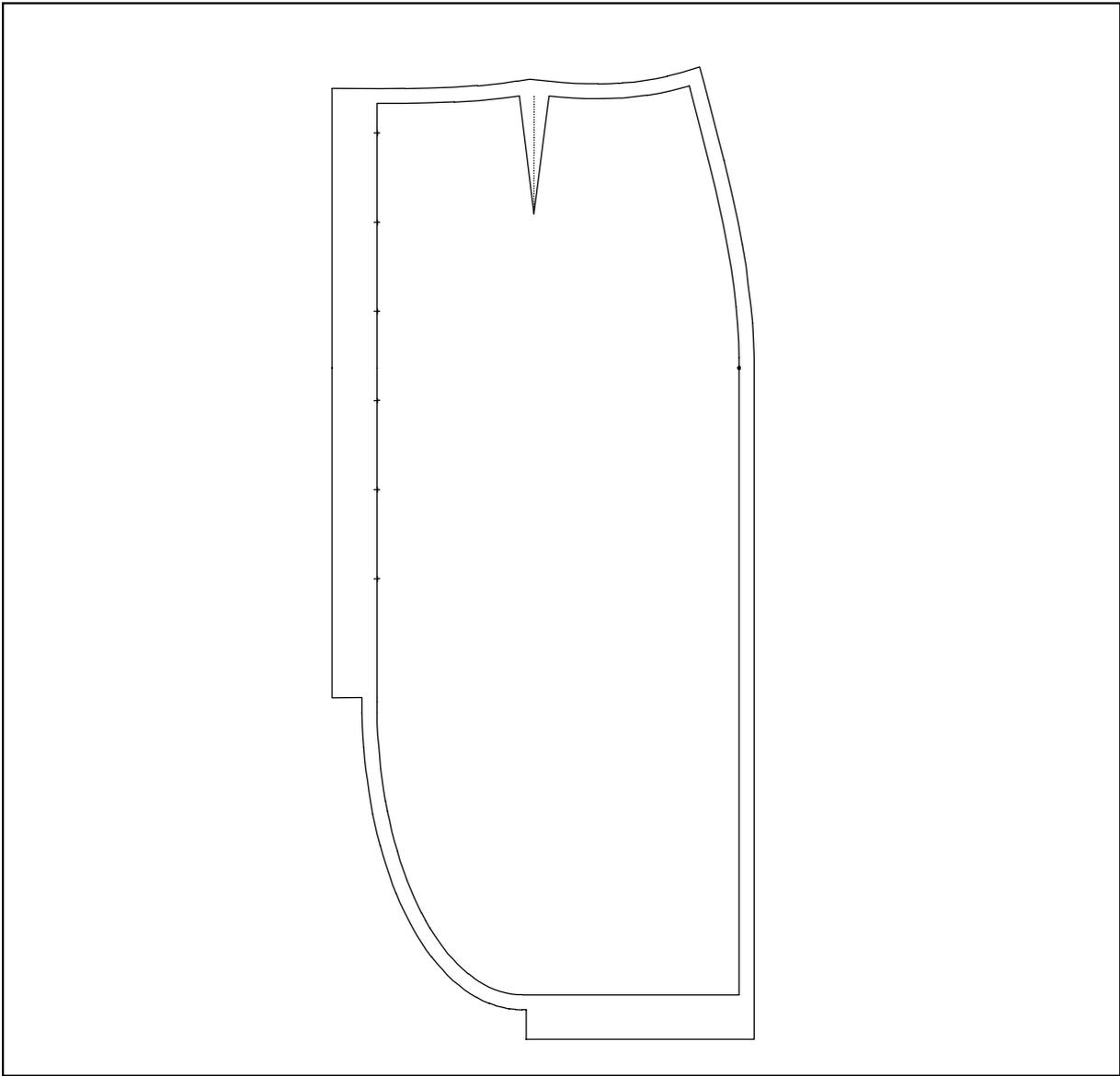
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Contents of this chapter are the functions for altering lines. Some of these are:

- linking lines,
- rastering, i.e. spreading points for button holes, notches and other markings along a line,
- length alterations and
- separating lines.

These very important functions must be mastered. Therefore, intensive practice is required.



5.1 Linking lines

The *link* menu

The *link* menu is opened from the basic menu. It allows for the linking of lines or the joining of lines with curves.

Step-by step guide

In the case of *link* (with straight line)
 ⇒ Activate the option *single* or *chain*
 ⇒ Click the lines to be linked following the right principle
 ⇒ Correction (several possible) by clicking *reset*
 ⇒ Terminate linking with *deposit*

In the case of *link with curve*

⇒ Activate *link with curve*
 ⇒ Click the two lines to be linked (right principle!)

Linking lines (joining)

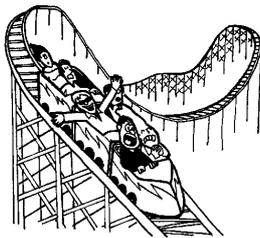
The first part of the menu is for linking lines by bridging the gaps between the lines with a straight line.

Linking lines is required when two or more lines are supposed to be treated as one during further construction steps.

First you have to choose between the options *single* or *chain*. With *chain* all tangential lines (without kink) will be linked automatically in one operation. At the beginning, the simpler option *single* is recommended.

Reset resets the individual linking operations step-by-step. The link operation is terminated only with *deposit* and treated as one construction step in the record.

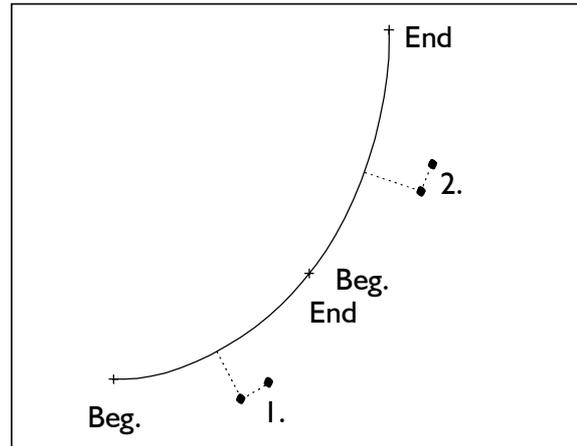
The end of the already linked lines (= basic line) is linked to the beginning of the clicked line. For the determination of direction the right principle applies.



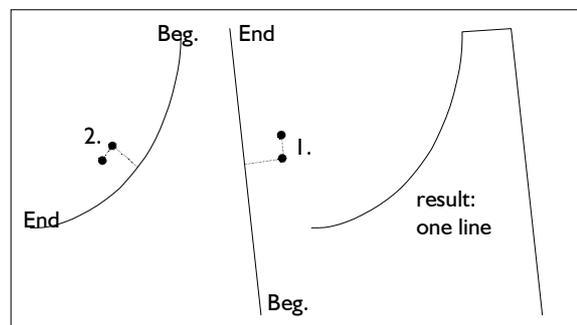
Picture 5-1 shows the linking of two lines with *single* or *chain*. Beginning and end of the lines are determined by the right principle. For further information read the explanations in sections 4.3 and 4.6.

Picture 5-2 shows linking of two lines which are not touching with a straight line. Here, also, the right principle is to be followed.

link
link
single
chain
reset
deposit
link with curve
reset
measure



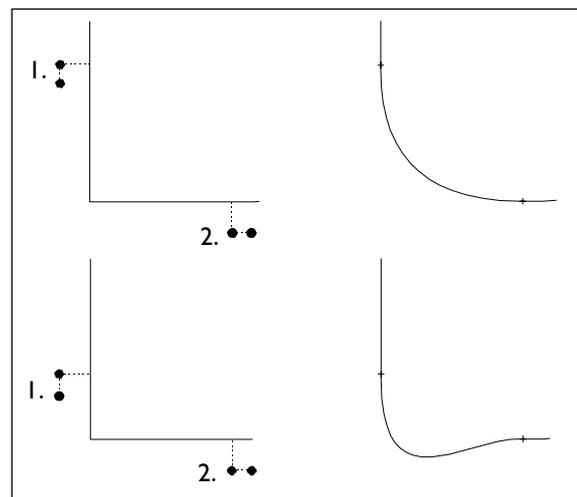
Picture 5-1



Picture 5-2

Link with curve

With the second group of functions in the *link* menu two lines can be linked by a curve. This function can be used for linking separate hem lines, side seams or taking out darts for example.



Picture 5-3

After having activated *link with curve* the two lines to be linked have to be clicked, following the right principle. The new joining curve begins and ends at the respective click positions, thus, determining the shape of the curve (see picture 5-3).

If the joining curve does not fulfil your ideas, reset and link again. The shape of the curve is influenced heavily by the choice of beginning and final point. The curve form can be compared to a flexible steel band fixed and adjusted at the click points. Generation of a certain shape of curve requires practice and experience.

Further functions

With *reset* the last construction step can be undone. The last construction step can be

- linking two lines with a curve or
- construction of a line from several lines with the functions *single* and *chain*.

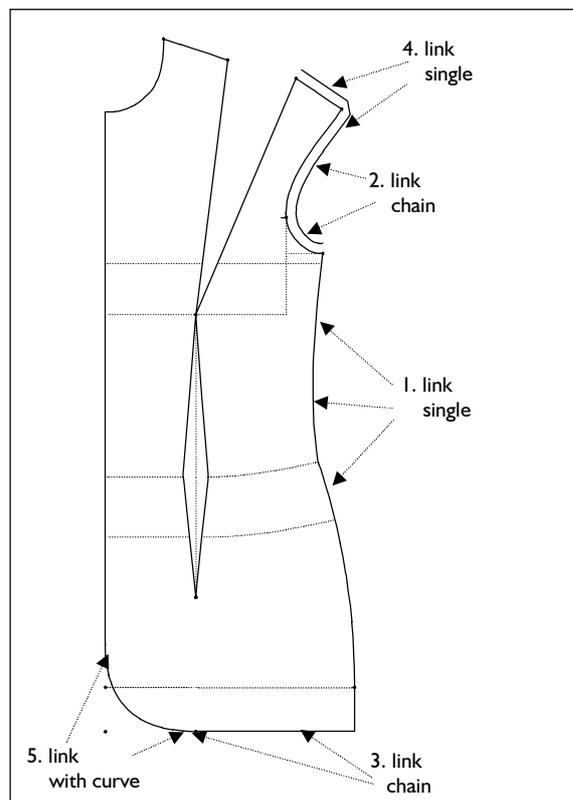
With *measure* functions for measuring distances, lengths and directions can be called. These functions are explained in chapter 9.

The right principle is of great significance in Grafis. It was explained in detail in sections 4.3 and 4.5. The “direction indicator” on the cursor is designed to make understanding and application of the right principle easier. Practise it with the link function, also. Click close to the lines, not on the beginning or final points. This allows the “direction indicator” to indicate clearly.

Exercises

1st Exercise

Call the basic block „Grafis Bodice 10“. Create parallels to the armhole and the shoulder with 10 mm distance. Link the following lines (picture 5-4):



Picture 5-4

- the side seam with *link single*
- the armhole with *link chain*
- the hem line with *link chain*
- the parallels to armhole and shoulder with *link single*
- the centre front with the hem with *link with curve*.

Click to the right of the lines in direction of travel. If you have made a mistake click *reset* (also repeatedly) and carry on. Terminate linking by clicking *deposit*.

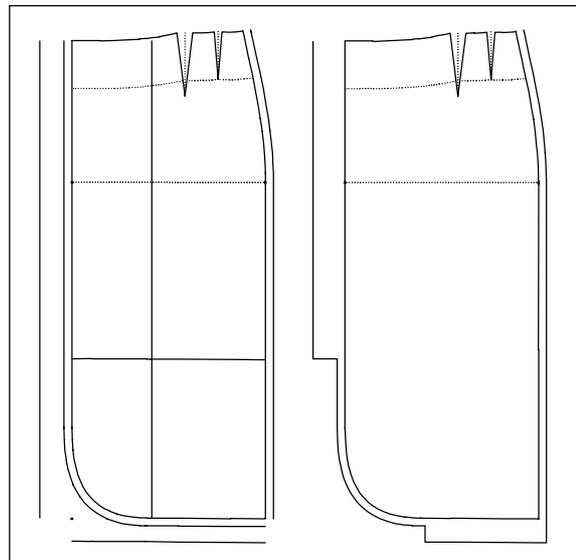
When linking the centre front with the hem, undo with *reset* and repeat linking, varying the click positions.

2nd Exercise

Call the basic block „Grafis Skirt 20“ and create the following parallels

- 30mm from the hem outside
- 40mm from the centre front outside
- 100mm from the centre front inside
- 200mm from the hem inside

Link the centre front and the hem with *link with curve* and construct further parallels of 10mm respectively to the outside of the centre front and the hem. Then, construct the displayed corner with *corners* (Picture 5-5).

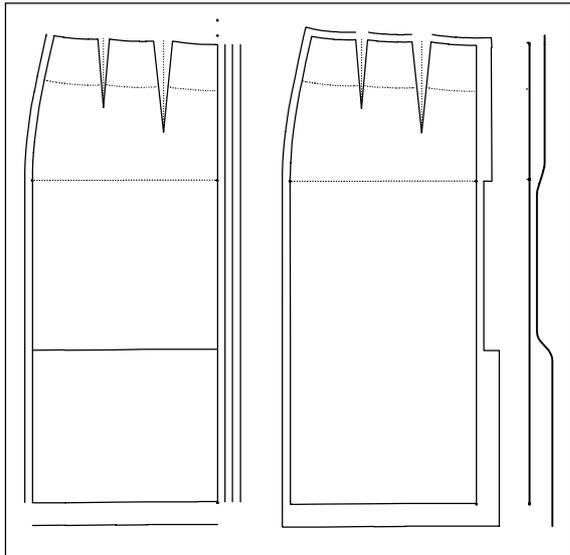


Picture 5-5

3rd Exercise

Call the basic block „Grafis Skirt 20“ and construct the following parallels:

- 200mm to the hem on the inside for vent height
- 30mm to the centre back to the outside for vent width
- 20mm to the centre back to the outside for concealed zip
- 10mm to the side seam, centre back and waist for seam allowance



Picture 5-6

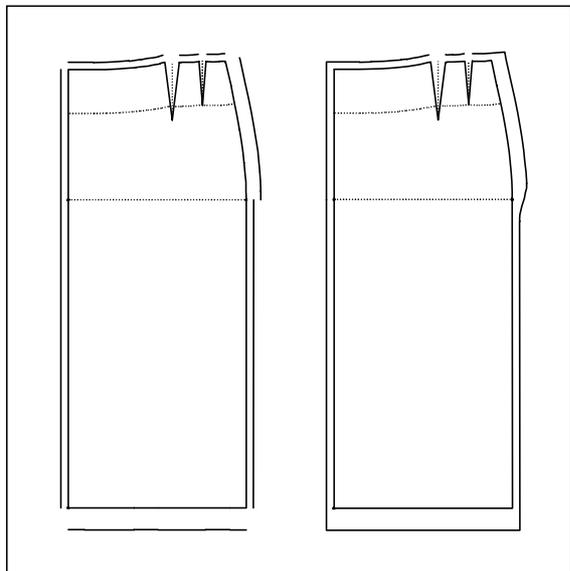
Construct the displayed corner and then, link the centre back according to Picture 5-6 far right. Grade in different sizes.

4th Exercise

Call the basic block „Grafis Skirt 20“ and construct the following parallels:

- 10mm to the centre front, side seam and waist
- 30mm to the hem
- 20mm to the upper side seam.

Link the side seam with link with curve and close the displayed corners with corners (Picture 5-7).



Picture 5-7

5.2 Raster

The raster menu

The *raster* menu offers five different principles for the construction of point sequences. The point sequences are generated along a line. The function *line* is the reverse function, changing a point sequence into a line.

Step-by step guide

Generate a point sequence:

- ⇒ Adjust parameters of the required raster type
- ⇒ Activate the required raster type
- ⇒ Adjust +/-copy
- ⇒ Click the line, following the right principle

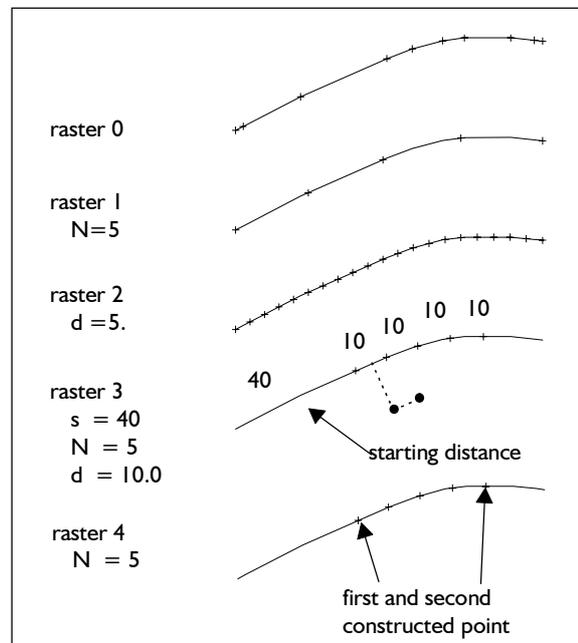
Create line from point sequence:

- ⇒ Activate *line*
- ⇒ Adjust +/-copy
- ⇒ Click the point sequence

raster
raster 0
raster 1 N = 5
raster 2 d = 20.0
raster 3 s = .0 N = 5
raster 4 d = 5.0 N = 5
line
- copy reset measure

raster 0

In Grafis each line is a polygon (see section 4.3). With *raster 0* the fulcrums of a line are displayed. On a straight line this would be the starting and final point. Picture 5-8 shows an example for a curve.



Picture 5-8

raster 1

This function constructs a number of points with the same distance along a line. The number of points including starting and final points are to be set in the line $N=...$ (picture 5-8). Click the line with  type the number of points and <ENTER>. After having activated *raster 1* the required line is to be clicked.

raster 2

With *raster 2* points with a pre-set distance $d=...$ are constructed along a line. The distance is corrected by Grafis so that the points have the same distance from beginning to end (picture 5-8). Thus, the pre-set value is an approximation.

The required value is entered in the line $d=...$ After having activated *raster 2* the line is to be clicked.

**raster 3**

raster 3 is one of the two buttonhole functions. For this function the starting distance $s=...$ from the beginning of the line to the first point, the number of points $N=...$ and the distance between the points $d=...$ is to be entered (picture 5-8).

After having entered the values for $s=...$, $N=...$ and $d=...$ and activating *raster 3* the required line is to be clicked following the right principle. The right principle was explained in detail in the sections 4.3 and 4.5.

raster 4

raster 4 is the second buttonhole function. A number of points $N=...$ is distributed evenly between two constructed points (picture 5-8).

First the number of points $N=...$ is to be entered and the line is to be clicked. For construction of starting and final point of the raster area the sub-menu point construction appears which is explained in chapter 6, only. Practice the function *raster 4* only after having learned about point construction.

Line

The *line* function is the reverse function to the *raster* functions. Activating *line* and clicking a point sequence creates a line from the point sequence.

Further functions

With the *+/-copy* switch you decide whether or not the original object remains existent. When changing a line into a point sequence with

+copy both line and point sequence are existent,

-copy only the point sequence is existent.

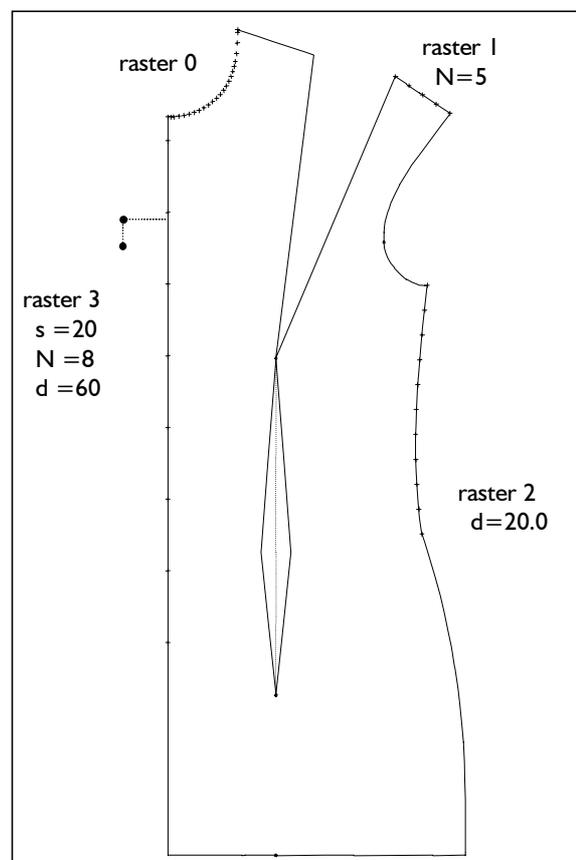
With *reset* the last construction step is undone.

The functions under *measure* are the contents of chapter 9 and are not to be discussed in advance.

Exercises**1st Exercise**

Call the basic block „Grafis Bodice 10“ and construct the following in the front with the raster function (Picture 5-9):

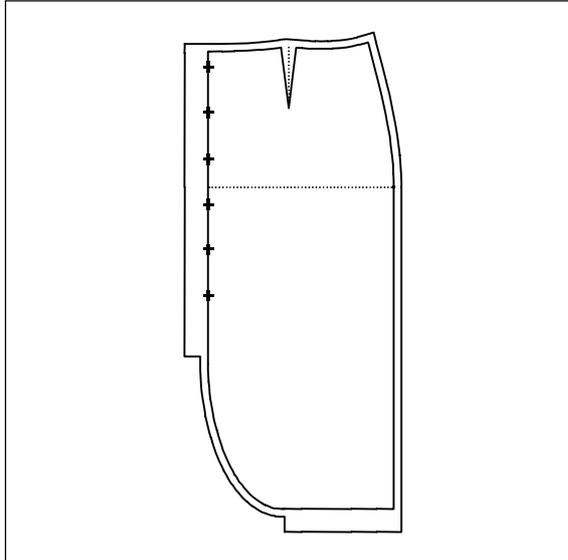
- The fulcrums (base points) of the neckline. Set the switch to *+copy* to retain the original line!
- A total of five equally distributed points on the outer shoulder..
- Equally distributed points with approx. 20mm distance on the upper part of the side seam. First, link the upper side seam.
- A total of 8 points for buttons. The 1st point is situated 20mm from the neckline. The distance between the points is 60mm respectively.



Picture 5-9

2nd Exercise

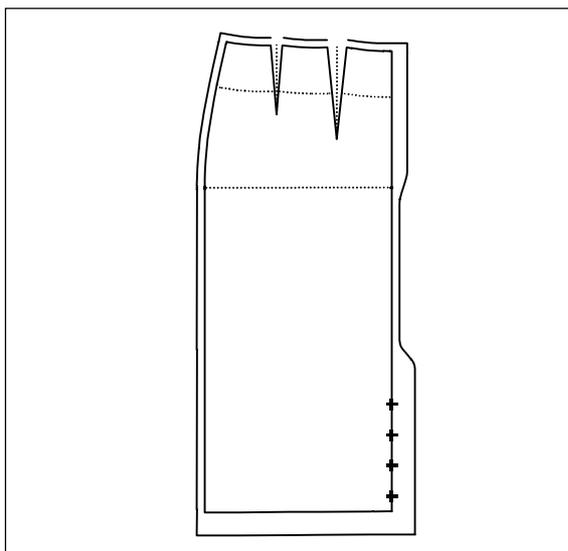
Call the basic block „Grafis Skirt 20“ or the exercise from Section 5.1 and construct a buttonstand on the centre front. The first button is to be situated 20mm from the waist. A total of 6 buttons with a distance of 60mm are to be placed.



Picture 5-10

3rd Exercise

Call the basic block „Grafis Skirt 20“ or the third exercise from section 5.1 and construct a buttonstand on the centre back from the hem. The first button is to be placed 20mm from the hem. A total of 4 buttons with a distance of 40mm are to be positioned.



Picture 5-11

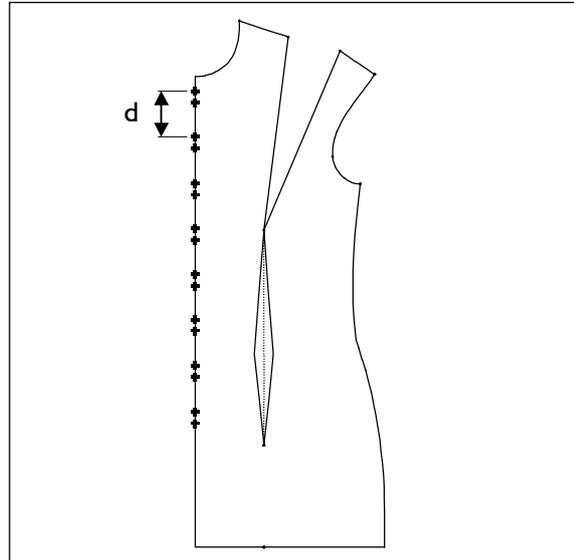
4th Exercise

Call the basic block „Grafis Bodice 10“ and place paired buttonholes on the centre front. A total of 8 button pairs are to be created with a distance of 60mm between the pairs. The first button is positioned 20mm from the neck on the centre front.

The distance between the two buttons in a pair is 15mm (Picture 5-12).

Construct the paired buttonstand with two point sequences and the following settings:

$s=20\text{mm}$ $s=35\text{mm}$
 $N=8$ $N=8$
 $d=60\text{mm}$ $d=60\text{mm}$



Picture 5-12

5.3 Lengthening and shortening lines**The *lengthen* menu**

The *lengthen* menu contains functions for lengthening and shortening lines at the ends (*linear*) or through alteration of the shape (*forming*).

These functions are especially significant for the adjustment of line lengths such as side seams, body seams and crotch seams.

Step-by-step guide

- ⇒ Activate the required type of length alteration (*linear* or *forming*)
- ⇒ Enter the value for the alteration under *lengthen by* or *lengthen to*
- ⇒ Activate *lengthen by* or *lengthen to*
- ⇒ Click the line to be altered (with *linear* the right principle is to be followed)

Types of length alteration

There are two different options available for lengthening/shortening lines (Picture 5-13):

With *linear* the line is lengthened straight at its end or shortened along the line. The end of the line is determined according to the right principle when clicking.

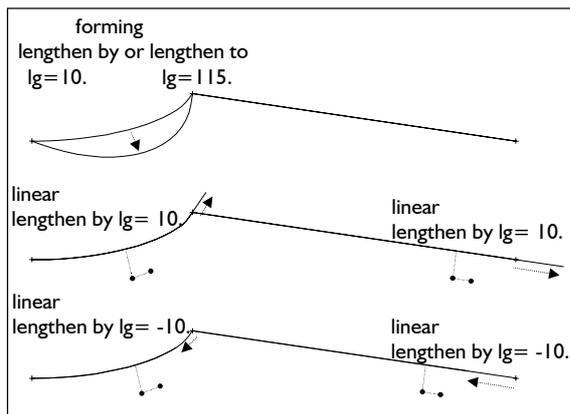
lengthen
linear
forming
lengthen to lg= 100.
lengthen by lg= 10.
reset
measure

With **forming** starting point and final point are fixed. The line is shaped to attain the pre-set length. **forming** does not apply to straight lines.



Lengthen to and lengthen by

With **lengthen to** a line is lengthened *linear* or *forming* to the pre-set length. The required length is pre-set accurately (Picture 5-13).



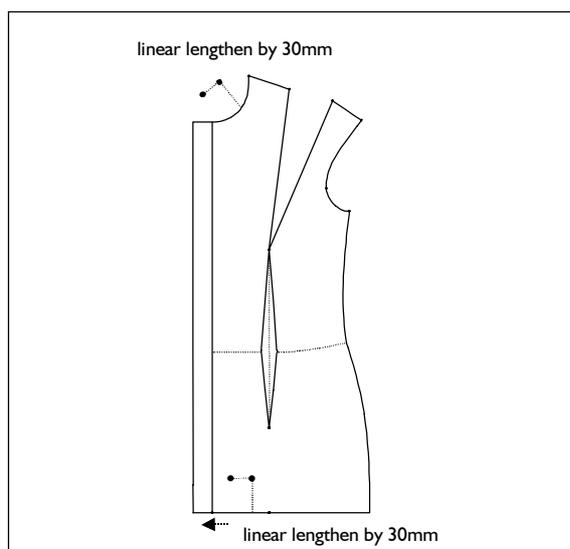
Picture 5-13

With **lengthen by** a line is lengthened (positive value) or shortened (negative value) *forming* or *linear* by a given amount.

Exercises

1st Exercise

Call the basic block „Grafis Bodice 10“ and construct a parallel of 30mm to the centre front.



Picture 5-14

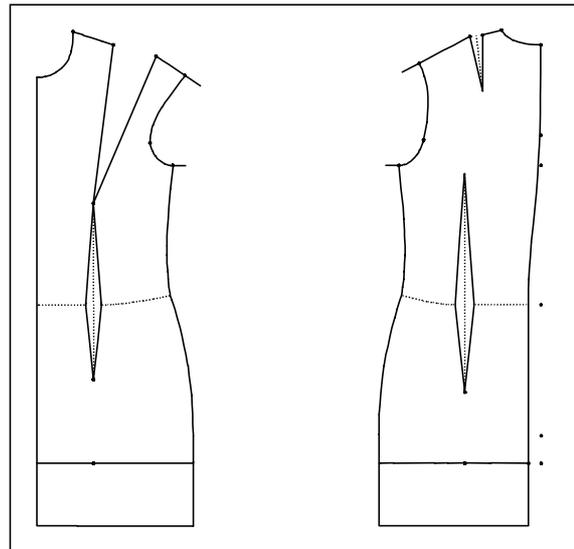
Lengthen the neckline and the hem line linear by 30mm. Follow the right principle when clicking (Picture 5-14).

2nd Exercise

Call the basic block „Grafis Bodice 10“ and construct a parallel of 100mm to the hem lines. Then, lengthen

- the shoulder by 30mm,
- the armhole by 20mm,
- the centre front, centre back and side seam by 100mm.

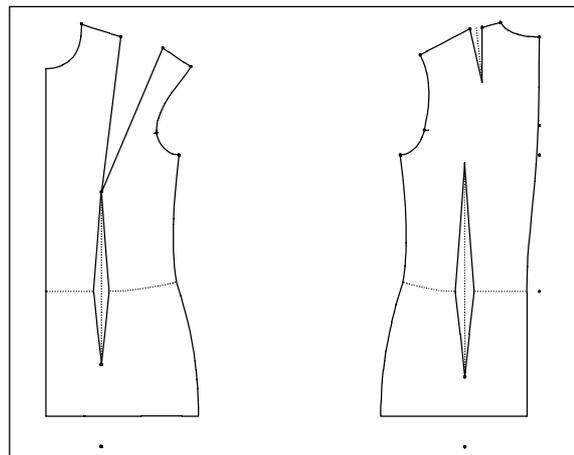
Follow the right principle when clicking (Picture 5-15).



Picture 5-15

3rd Exercise

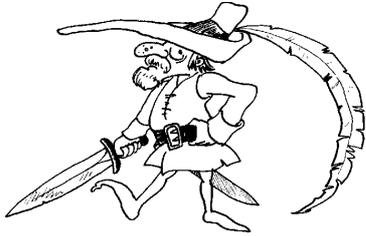
Call the basic block „Grafis Bodice 10“ and shorten the centre front, centre back and the side seams by 50mm. Use *lengthen linear by -50* and follow the right principle when clicking (Picture 5-16). Then, move the hem line by 50mm with the *parallel* function using *-copy*.



Picture 5-16

5.4 Cut, “cut on” and separate lines

The *separate* menu



Cutting and separating lines can be called from the basic menu via *separate*.

Separate divides a line into two lines which touch at the separation position and can be processed individually. If the cut mark switch is set to **+cut mark** the separation position is marked by a large point.

Cut shortens or lengthens a line up to the intersection. Lengthening is called “cut on”. **Reset** (last function in the menu) resets the last separation or cutting operation respectively.

separate ⇒ 2 lines
cut / cut on ⇒ 1 line

The separate/cut position can be determined in three different ways.

Step-by-step guide

Separate or cut at a cutting line

- ⇒ Define/construct a cutting line with *click* or *p+digi*
- ⇒ Activate *separate* or *cut*
- ⇒ Adjust *+/-cut mark*
- ⇒ Click lines to be separated or cut.

Separate in a corner

- ⇒ Activate *separate in corner*
- ⇒ Adjust *+/-cut mark*
- ⇒ Click the corner in which the lines are to be separated outside

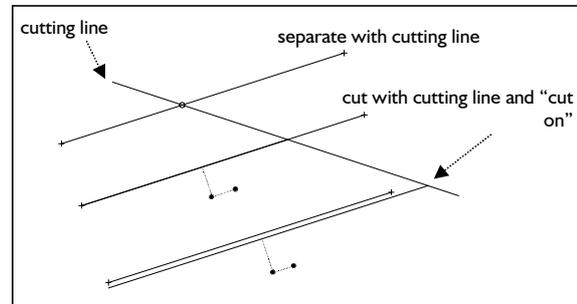
Separate or cut with click line (“freehand” by eye)

- ⇒ Activate *click line / separate* or *click line / cut*
- ⇒ Adjust *+/-cut mark*
- ⇒ Click the line

separate
cuttingline
click
p + digi
separate
cut
separate in corner
click line:
separate
cut
+cut mark
reset
measure

Separate / cut at a cutting line

Separating or cutting with a cutting line is the accurate option. First, a cutting line is to be determined. One or several lines can be separated or cut with it. “Separate with cutting line” belongs to the first group of functions in the menu.



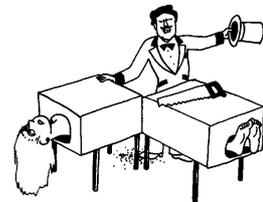
Picture 5-17

First, the cutting line is to be defined. Grafis offers two options:

1. With *click* an existing line is determined as cutting line.
2. With *p+digi* the first point of the cutting line is constructed and the other point is defined freehand by moving the mouse. As point construction is content of the next chapter, this function is not explained in more detail at this time.

The current cutting line is displayed in a different colour. Whether to cut or separate with this cutting line is determined by activating the appropriate function *cut* or *separate*.

1. With *separate* with cutting line the clicked line is divided at the intersection with the cutting line provided the two lines intersect. Practise this option with *+cut mark*. The separation position is marked by a point and thus easier to recognise.



2. With *cut* with cutting line the part of the line beyond the cutting line in respect to the click position disappears. The click point defines the part of the line to remain existent. Result of this operation is one line, only.

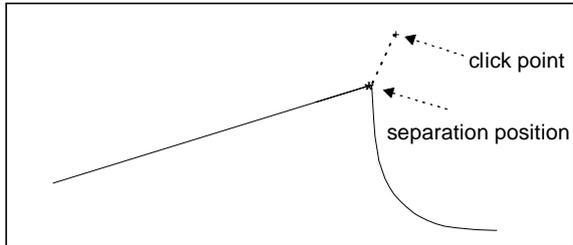


It is not absolutely necessary for the cutting line and the line to be cut to intersect. A line ending before the cutting line is lengthened up to it when cutting with cutting line.

This is known as “cutting on” amongst Grafis operators. „Cutting on“ is possible to a maximum of 500mm.

The different options are depicted in Picture 5-17. The original lines are dashed.

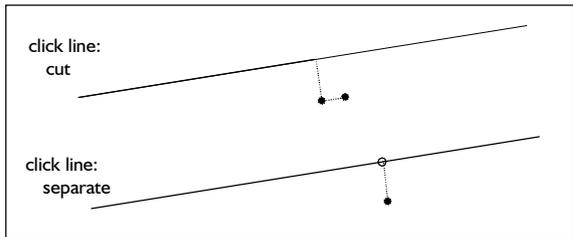
Separate in a corner



Picture 5-18

This function separates a continuous line in a corner. The respective curve is to be clicked on the outside as Grafis separates at a point where an imaginary lightning would strike (lightning principle). As a result a small arrow is shown at the separation position for a short while (Picture 5-18).

Separate or cut with click line (“freehand” by eye)



Picture 5-19

Click line / separate divides a line at the click position exactly. The same applies to click line / cut. Here, the right principle is to be followed. The part of the line beyond the click position according to the right principle disappears.

Further functions

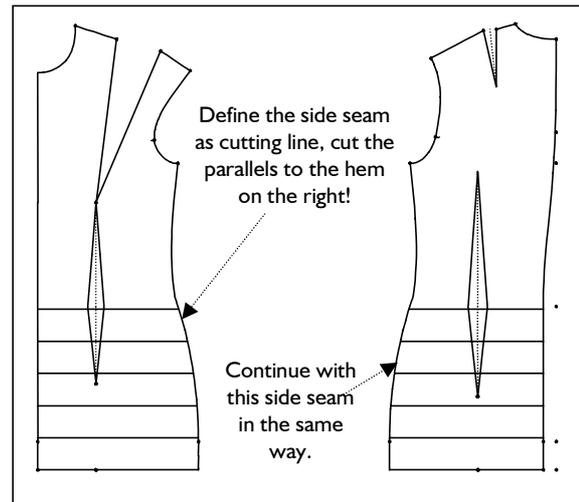
The cut mark switch decides whether or not a marker is to be set when separating lines. As a rule, use +cut mark, as it is easier to recognise the separation position. A cut mark is a point with the attribute “gr. point” (see section 7.5). The cut markers can be deleted as points.

Reset can undo the last construction step.

Under *measure* the same functions hide we have kept from you before. Please be patient until chapter 7.

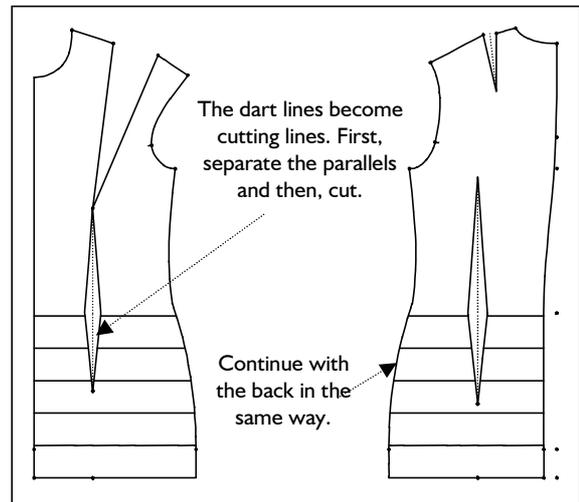
Exercise

Call the basic block „Grafis Bodice 10“ and construct 5 parallels each to the hem at a distance of 50mm. Cut the parallels along the side seam (Picture 5-20). Please note that clicking defines the side for cutting off. Errors can be corrected with reset.



Picture 5-20

Continue and remove also the pieces of the parallels from the dart. Define the first dart line as the cutting line and separate initially. Then, define the other dart line as the cutting line and cut (Picture 5-21).

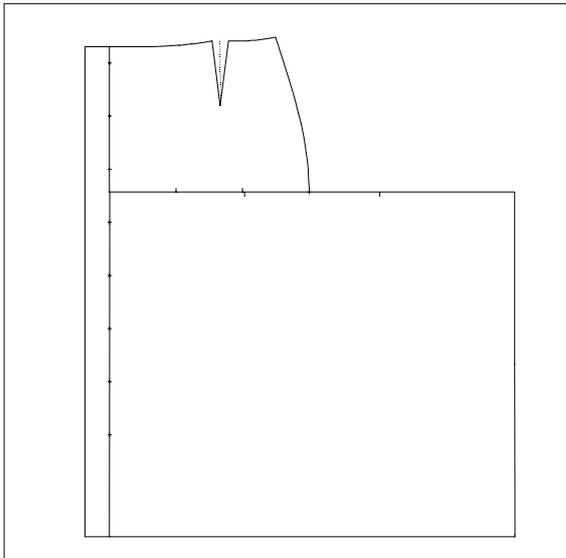


Picture 5-21

5.5 Exercises

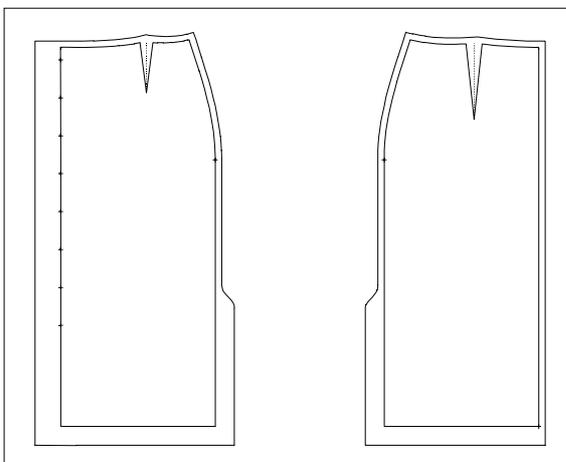
1st Exercise

From the basic block „Grafis Skirt 20“ construct a skirt with gathering. First, delete the skirt back. Construct a parallel of 30mm for the overlap. Lengthen the hip line and hem line by 250mm. Move the side seam by 250mm with *parallel* using *-copy*. Then, construct a buttonstand on the centre front. The first button is to be positioned 20mm from the waist. A total of 6 buttons with a distance of 60mm are to be placed. Set the gathering symbols once you have worked through Chapter 7.



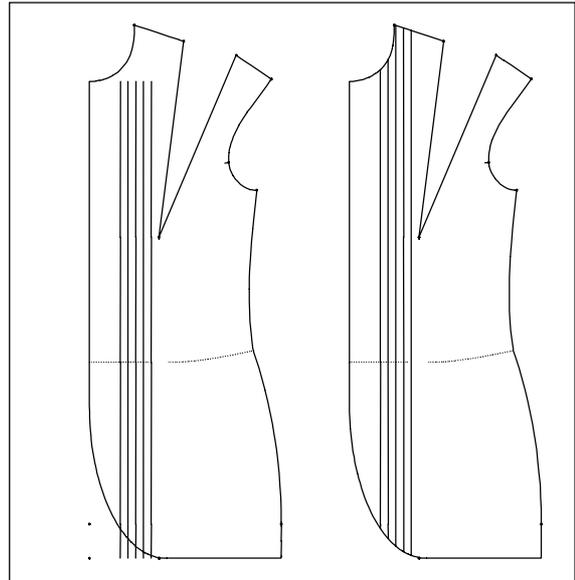
2nd Exercise

From the basic block „Grafis Skirt 20“ construct a skirt with vent in the side seam and an overlap with buttonstand. The vent height is 200mm, vent width is 30mm, overlap and hem are 30mm and all seam allowances are 10mm. The first button is to be positioned at 20mm from the waist. A total of 8 buttons with a distance of 65mm are to be placed.



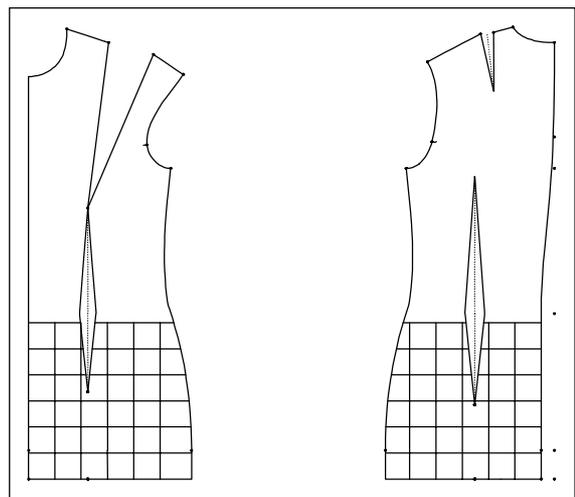
3rd Exercise

Construct five pin-tucks in the front of basic block „Grafis Bodice 10“. First, delete the waist dart. Create the first parallel at a distance of 40 mm to the centre front. The other four pin-tucks should be positioned at a distance of 10mm from the first pin-tuck. Then, link the hem and construct a cut away with *link with curve*. Cut the parallels at the hem, the neckline and at the shoulder with the *separate* function.



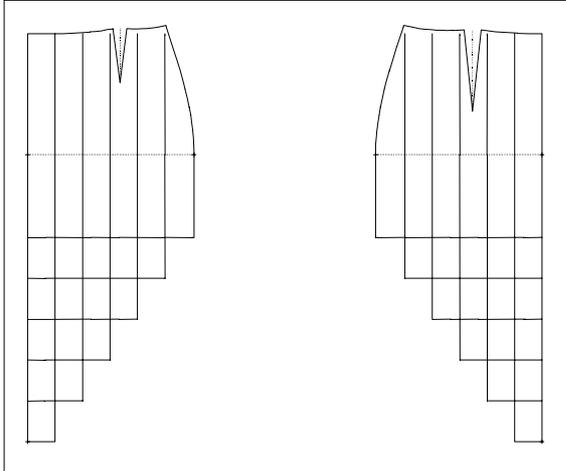
4th Exercise

Call the basic block „Grafis Bodice 10“, link the hem lines in the front and in the back and create a parallel of 40mm to the centre front, centre back and the hem. Cut the parallels at the side seam and at the waist darts. Use the *separate* function.

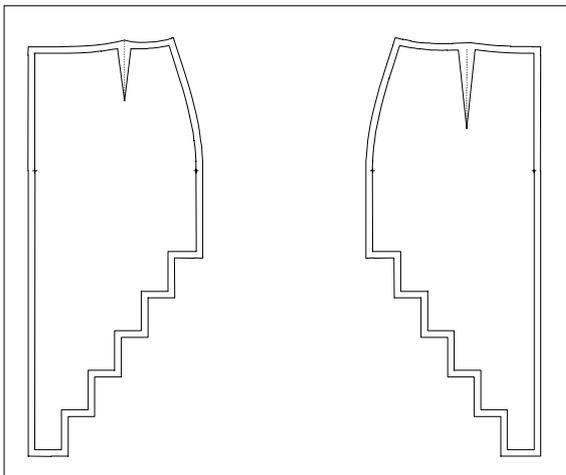


5th Exercise

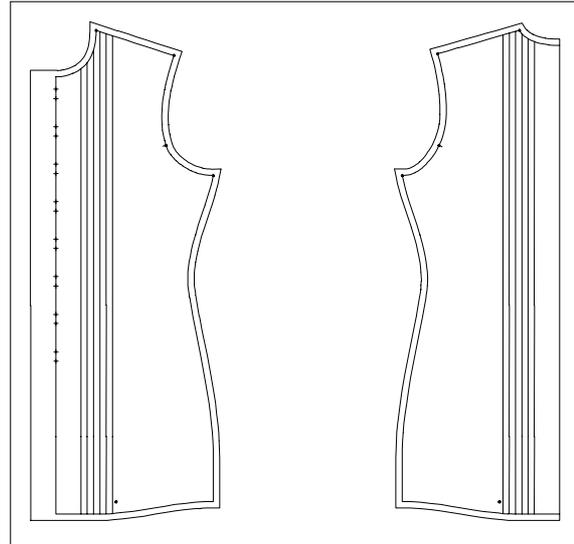
Open the style „Straight skirt“ from Chapter 2 Section 2.4. Construct five parallels at a distance of 70mm to the hem and five further parallels at a distance of 40mm to the centre front and centre back. Create the displayed pattern with *corners*.



Construct a seam allowance of 10mm and close the perimeter with *link* (waist) and *corners*.

**6th Exercise**

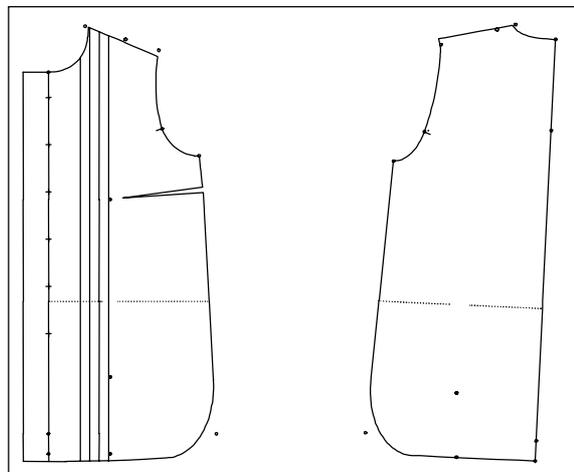
Call the basic block „Grafis Bodice 20“ and construct parallels to the centre front and centre back at a distance of 40mm to the inside and further five parallels at a distance of 10mm to the new parallel lines. Cut the parallels at the hem, neckline and at the shoulder. Construct an overlap of 40mm to the centre front and the displayed seam allowance of 10mm. Close the perimeter with *corners*.



Construct a paired buttonstand on the centre front. A total of 8 button pairs are to be placed at a distance of 60mm between pairs. The first button is positioned 20mm from the neckline on the centre front and the distance between the buttons of a pair is 15mm, see also the 4th Exercise in Section 5.2.

7th Exercise

Open the style „Shirt blouse“ from Chapter 2 Section 2.5 and delete the points on the centre back, the waist dart and the auxiliary lines. Link the lines of the shoulder, the armhole, the side seam, the hem and the centre back with *link single* respectively. Create a *corner with curve* (120/ 80mm). Construct a sequence of 6 points on the centre front, starting 40mm from the neckline at a distance of 75mm between points. Create parallels for pin-tucks. The first pin-tuck is to be positioned 50mm from the centre front. The other pin-tucks are placed at a distance of 15mm. Cut the pin-tucks at the neckline and the shoulder. Construct an overlap of 40mm and close the corners of the overlap.



Save the style as „Blouse with pin-tucks“.