Chapter 12 "The construction parameter g and z values"

Content

_____

The g and z values complete the palette of construction parameters so that basic blocks can be drafted from scratch. The g values deliver the relationship to the measurement chart of the construction system. The z values allow for calculation of construction parameters with numerical values or values measured in the construction.

The emphasis of this chapter lies, again, with the exercises for which you should take your time. The gradeable basic blocks displayed are exercise results.

_____

_____
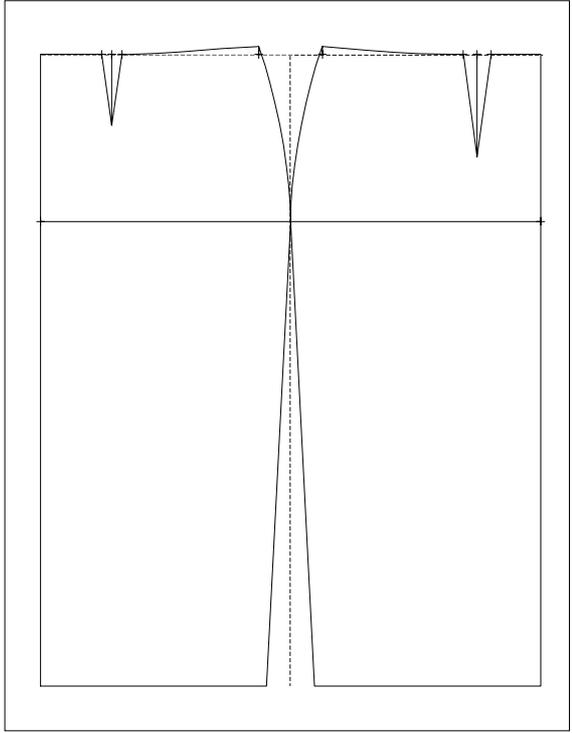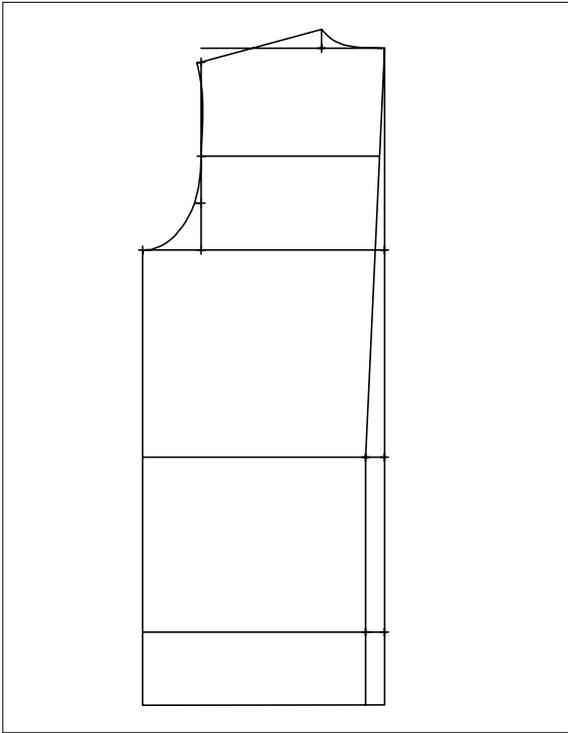
12.1 The g values

g values are the size values of the current construction system which are logged in the well-known measurement charts. g1 defines the first value of the current measurement chart, g2 the second value and so on. In the construction system "23-Werte Hohenstein Women" for example g1 is the bust and g3 the height (see Picture 12-1). The measurement charts can be edited, viewed and/or printed via *Extras | Measurement Charts....*

The step-by-step guide for construction system 23-Werte Hohenstein Women is as follows:
The step-by-step guide for construction system 23-Werte Hohenstein Women is as follows:

p+l+c+r	below *p+w+h:*
w=g4	type and <ENTER>
h=g3	type and <ENTER>
p+w+h	click
p on *x&y* with *x=y=0*	
measure	

Check the result by measuring.

23-Werte Hohenstein Damen V	Gr = ___42_0	KERSTIN	05-02-03

No.	Measurement	Indiv.	Diff.	
1	Bust	960	[900]	-60
2	Hip	1015	[1000]	-15
3	Height	[1680]		
	------------------- Secondary measurements -------------------			
4	Waist	780	[750]	-30
5	Nape to waist (centre back)	[416]		
6	Neck/shoulder to waist o. bust	[449]		
7	Across back (part of bust)	[375]		
8	Body rise	[280]		
9	Waist to knee	[606]		
10	Waist to hip	[210]		

G1 G2 G3 G4 G5 G10

Picture 12-1

Always consider the selected construction system when working with g values!

g values are applied in the same way as x values (section 11.2, Picture 11-11). In conjunction with the z values - which will follow - they allow for drafting basic blocks on screen.

Exercises

<u>1st Exercise</u>
Construct a rectangle with the waist as the width and the body height as the height. Grade in sizes 38, 038, 42 and 042 (Picture 12-2).
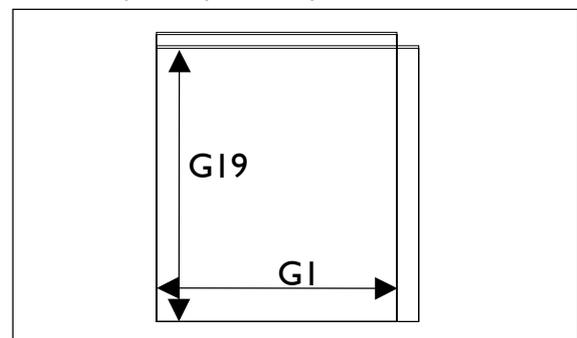

G3

G4
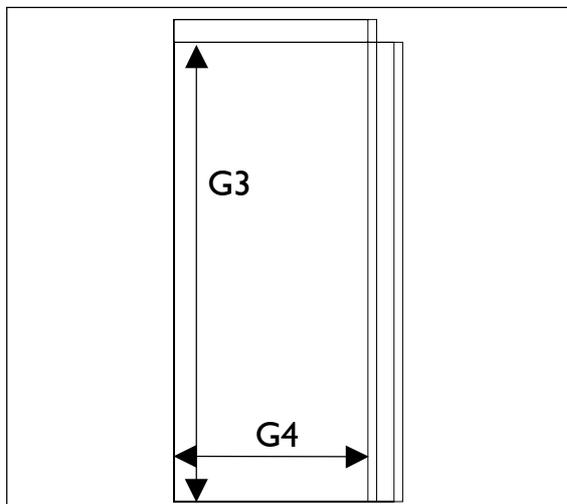
Picture 12-2

<u>2nd Exercise</u>
Construct a rectangle with the bust as width and waist to floor as height. Grade the sizes 38, 538, 42 and 542 (Picture 12-3).

The step-by-step guide for construction system 23-Werte Hohenstein Women is as follows:
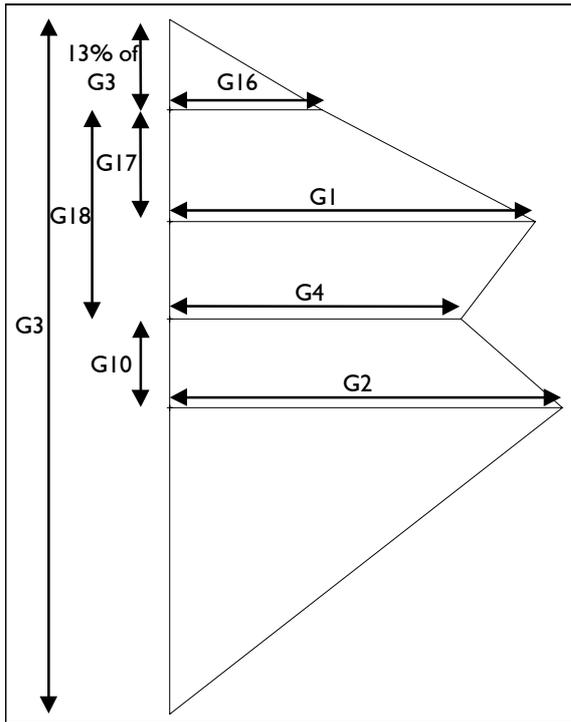
p+l+c+r	below *p+w+h:*
w=g1	type and <ENTER>
h=g19	type and <ENTER>
p+w+h	click
p on *x&y* with *x=y=0*	

G19

G1

Picture 12-3

<u>3rd Exercise</u>
Construct the figure displayed in picture 12-4 or a similar shape in the construction system '23-Werte Hohenstein Women'. The circumference measurements are not halved or quartered. The calculation of g values is possible with the application of z values (next section).

_____

Picture 12-4

$p+l+c+r$

 $p+lg+dir$ with $lg=g3$

 p_____

  rlg on l with $rlg=13$.

 $p+d$ on l with $d=g17$

 $p+d$ on l with $d=g18$

 $p+d$ on l with $d=g10$

 $p+lg+dir$ with $lg=g16$

 $p+lg+dir$ with $lg=g1$

 $p+lg+dir$ with $lg=g4$

 $p+lg+dir$ with $lg=g2$

 $p==>p$ construct contour

grading

12.2 The z values

What are z values?

z values are calculated construc-
tion parameters. For the calcu-
lation of z values

- all defined construction
  parameters (x, xg and g val-
  ues),
- previously defined z values,
- measurements from the
  construction, so-called pro-
  process data,
- numerical and mathematical functions
- can be used.

Defined z values are applied in the same way as x
values (section 11.1).
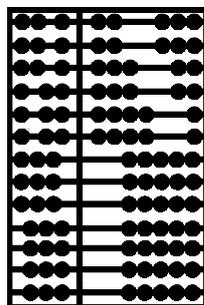
Entering and altering z values

Entering and altering z values is started with the
function key <F11> or via *Extras | Z Values*. With
few exceptions this is possible in all menus after *test
run* or a record function.

Pressing the <F11> key opens the z value entry
window (Picture 12-5). The z values with corre-
sponding comment are entered into the "z value
entry" dialogue field.
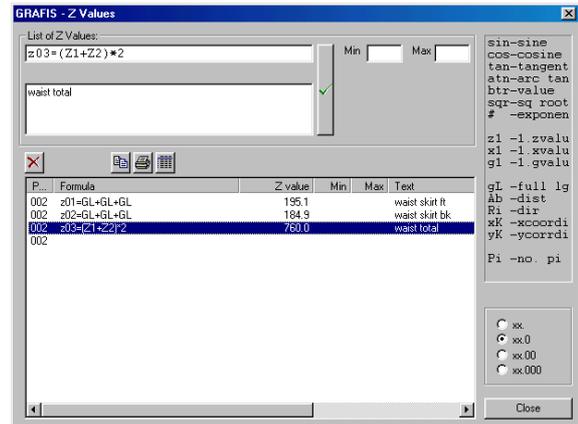
Picture 12-5

In the lower part of the window you can find the list
of available z values with their calculation formula,
the calculated result in the base size and the com-
ment. Having selected the z value, an existing z value
can be re-assigned. After correction of the selected z
value, the construction record runs to the saved
record step and re-determines the z value.

In addition, the z value list can be printed or copied
to the clipboard. The z value list displays the record
step during which the z value was entered. A z value
can only be deleted if it is no longer required for a
correct record run. When resetting the Grafis re-
cord the z values which are part of the record step
are also reset.

Use z values also for displaying warnings!

For example, if a distance may never be smaller than
100mm, generate a z value $z..=Ab$, enter the value
100 in the min field and measure the distance after
having pressed <ENTER>. In case the vaule is smal-
ler, a warning appears "Warning: value fallen below
minimum $z..=Ab$". Ensure a suitable comment for
the z value!

Syntax (spelling) of the z value entry

- Each instruction is to begin with $z1=$ or $z20=$. It
  is recommended to enter the z values in the given
  ascending order.

- Small and capital letters have the same significance. Spaces are ignored.
- The calculation of expressions in brackets is possible.
- Angles are to be entered in degrees (e.g.: sin(45) for the sine of 45 degrees).
- GRAFIS reports errors in mathematical expressions. They are marked with a small arrow below the position of the incorrect syntax.
- Defined x and g values, mathematical functions and process data can be used to calculate z values (see examples). Processing previously defined z values is also possible.

The calculation of z values is recorded. Resetting the record resets the z values also!

Permitted operators

+	for addition
-	for subtraction
*	for multiplication
/	for division
#	for exponent

Permitted operands

g6	g values g6=sixth value of the current measurement chart
x3	x values x3=third value of the x value table (*active part*) of the current part
xg5	x values of all parts (see chapter 11) xg5=fifth value of the x value table of all parts of the style
z4	z value z4
number	numbers, e.g. 12; -12.0; 23.6, with the point as decimal point
pi	the constant pi (=3.1415927)

Functions permitted as operands

cos	for cosine
sin	for sine
tan	for tangent
atn	for arc-tangent
sqr	for square root
btr	for absolute value

Process data permitted as operands

gL	full length of a clicked line
Ri	direction of a line in the "click point"
xK	x co-ordinate value of a point
yK	y co-ordinate value of a point
Ab	distance between two points

For the process data gL and Ri existing lines of the construction are to be clicked. The definition of the process data xK, yK and Ab is possible with the functions *click p, click l* or *click pl*.

Examples for correct z values

z1 = 12.3-124.3+100-33-.123
z2=123.4-pi+gL+sin(Ri-Ri)
z3=(gL+gL)*1.05+g1/100
Z4=z1+x12-g2/3.5+Ab
z5=sqr((xK-xK)#2+(yK-yK)#2)
      theorem of Pythagoras
z6=atn(z1/z3)

Exercise on entering z values

Call the "Grafis-Bodice 10" and define two x values. Enter the following z values. Scroll in the list of z values and check the calculated values on the right side of the list, see also Picture 12-5. The values apply to the base size.
<F11> or *Extras | Z Values...*
z1=1+2+3+4+5 <ENTER>
z2=100-20
z3=5*5
z4=100/4

z5=Pi	the number Pi
z6=G3	body height (23-Werte Hohenstein Women)
z7=G1/2	half of the bust
z8=G16/2	half of the neck
z9=G4/(2*Pi)	radius of a circle with circumference = waist

z10=GL+GL+GL <ENTER>
Now you are required 3x to click a line. In the menu only click 1 is shown. In the "Grafis-Bodice 10" you can click the 3 armhole curves (front and back) one after the other. In this case z10 equals the full length of the armhole curves.
z11=(Ab+Ab)/2 <ENTER>
Measure the distance between the final points of side seam in front and back by clicking the points at side seam / armhole and side seam / hem in the front with *click p* and then in the back. z11 is the average value of this distance.
z12=x2+100
z13=z2/2
z14=(Ab+Ab+Ab+Ab)*2
Measure four distances between 2 points, respectively, e.g. the waist in front and back without darts.
z15=z3+z4
z16=sqr(16)
Define your own z values and combine different functions, process data and construction parameters.

_____

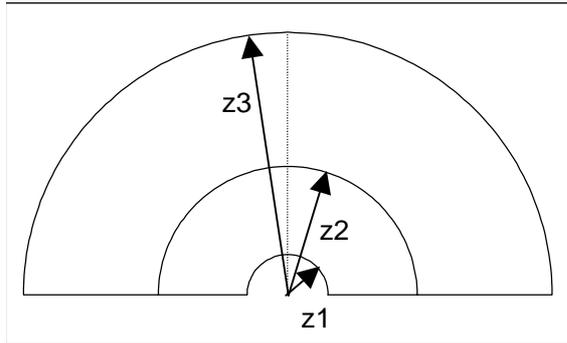**Exercises on the application of g values in z value calculations**

<u>1st Exercise</u>

Construct a ½ circular skirt with the waist being identical to the waist in the measurement chart and a length of 615mm from waist. Draw the hip circle at waist to hip (g10) + 30. The result is contained in Picture 12-6.

Use the following z values:
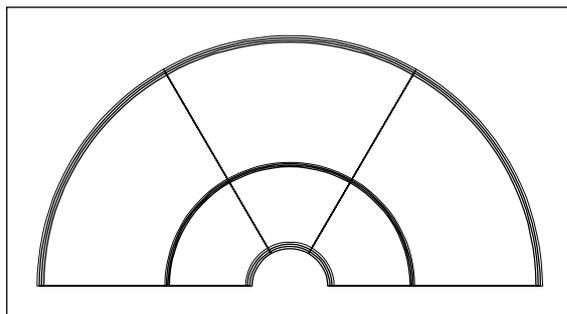
$z1=G4/(2*Pi)$

$z2=z1+G10+30.$

$z3=z1+615.$

Picture 12-6

Grade the circular skirt in 5 sizes.

<u>2nd Exercise</u>

Construct a ½ circular skirt with g, x and z values. The x value x1 is to be processed as an addition to the hip circle and x2 is to define the skirt length. Draw the hip circle again at a distance of waist to hip +x1.

From this skirt construct 1/4, 1/3 and other panel skirts (Picture 12-7).

Picture 12-7

The steps are analogous to Exercise 1 with x1=30 and x2=615 and the z values

$Z1=G4/(2*Pi)$

$Z2=Z1+G10+X1$
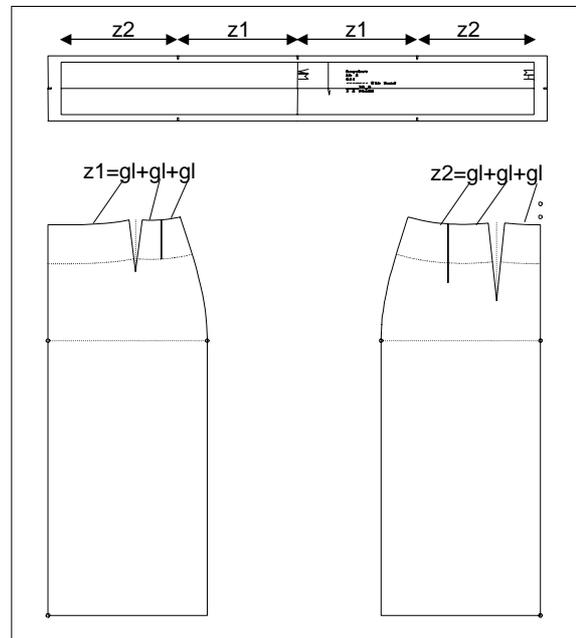
$Z3=Z1+X2$

Assign the x values with different values according to the different figure types.

Exercises on the application of <u>measurements of the construction (process data</u> in z value calculations

<u>1st Exercise</u>

Design a waistband with the length of the waist lines in „Grafis-Skirt 20" (Picture 12-8).

Picture 12-8

Call the construction and reset the hem reduction interactively and close the second dart. Open a new part and insert the three waist lines of front and back skirt respectively into the new part. Generate two z values:

$z1=gL+gL+gL$ waist lines front skirt

$z2=gL+gL+gL$ waist lines back skirt

Generate an x value for the waistband height preset to 40mm. Construct the waistband with z1, z2 and x1. Set notches on the side seam positions. Mark the centre back and centre front. Grade the skirt and then the waistband. Check the measurements.

<u>2nd Exercise</u>

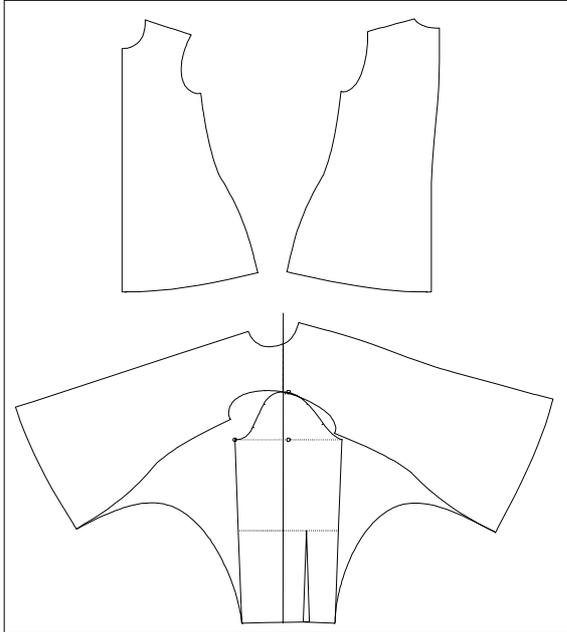Create a waistband for the construction "Grafis Trouser 10" (Picture 12-9) as in the 1st exercise.
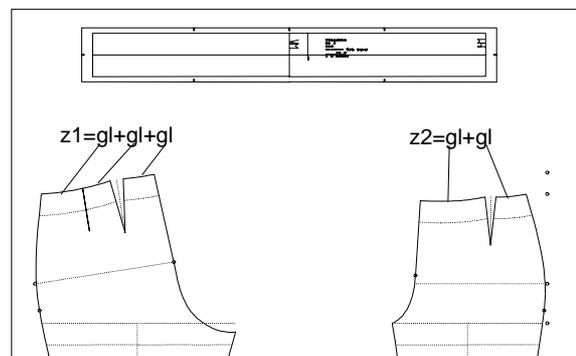
Picture 12-9

_____

12.3 Complex Exercises

<u>1st Exercise</u>
Develop a bat wing construction from the basic blocks „Grafis-Bodice 10" und „Grafis-Sleeve 10".


Call "Grafis Bodice 10", delete all auxiliary lines and the waist dart and relocate the bust and shoulder dart into the hem. Link the hem and the shoulder. Call the "Grafis Sleeve 10" into a further part and link it to the bodice construction behind. Lengthen the construction line upwards through the vertex. Transform the front and back onto the lengthened auxiliary line so that the corner point shoulder/ arm-hole of the bodice is placed on the vertex. Construct two curves between the sleeve and the front and back. Use a z value and the function *lengthen forming*, to ensure both curves have the same length.

<u>2nd Exercise</u>
Construct a children's hat with the values
    X1   head circumference in mm (460.)
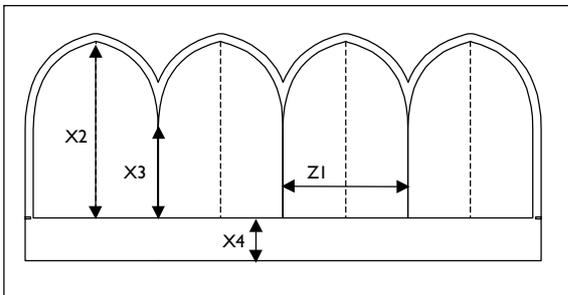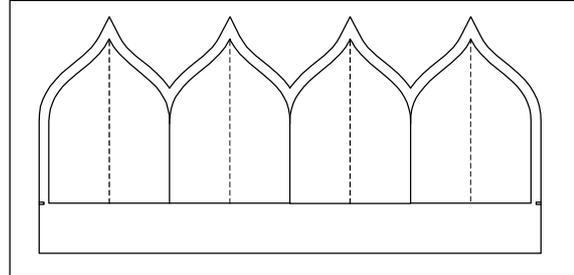

    X2   hat height in mm (165.)
    X3   head height in mm (80.)
    X4   seam allowance in mm (40.)
    $Z1 = X1/4 + 5$

Other hats can be obtained with different curve forms for example.

<u>3rd Exercise</u>
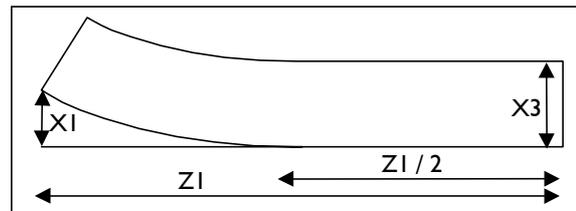Construct a stand-up collar with x, g and z values.
    X1   collar inset in mm (20.)
    X2   reduction in mm (2.)
    X3   collar width in mm (30.)
    $Z1 = g16 / 2 - x2$
or $Z1 = gL + gL$ (neck lines in front and back)

<u>4th Exercise</u>
Construct a straight skirt with g, x and z values (for picture see next page).
X value table pre-assignment:
    x1   dart width ft in mm (25.)
    x2   dart width bk in mm (35.)
    x3   dart length ft in mm (90.)
    x4   dart length bk in mm (130.)
    x5   hem reduction side seam in mm (30.)
    x6   waist reduction side seam in mm (40.)
    x7   skirt length in mm (400.)
    x8   position dart ft from CF in mm (90.)
    x9   position dart bk from CB in mm (80.)
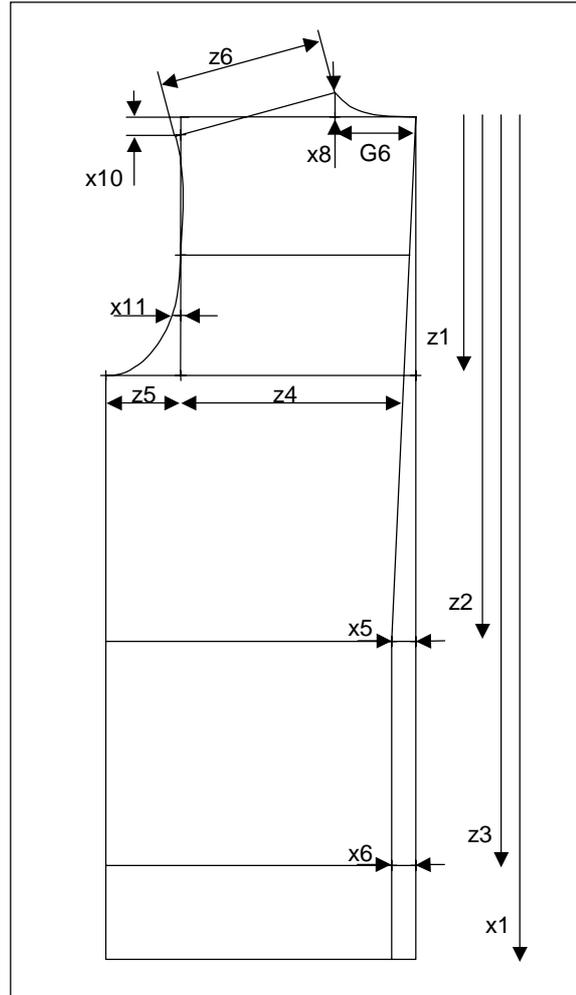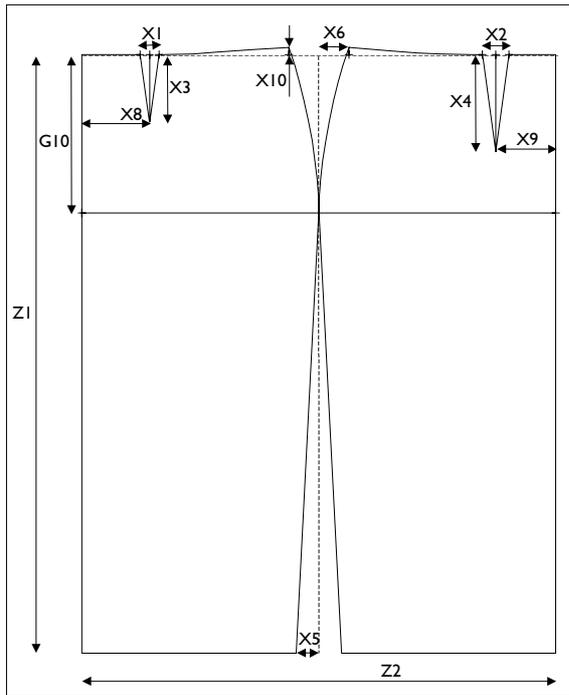   x10 lift waist in mm (10.)
z value table:
    $Z1 = G10 + X7$
    $Z2 = G4/2 + X1 + X2 + 2*X6$
    $Z3 = Z2/2$
    $Z4 = X1/2$
    $Z5 = X2/2$
Then, alter the position of the two darts by assigning x8 with 120 and x9 with 110.

_____

5th Exercise

Construct a back with g, x and z values in the <u>measurement system Müller&Sohn Women</u>.

X value table pre-assignments:

- x1   style length in mm (700.)
- x2   addition nape to scye in mm (20.)
- x3   addition nape to waist in mm (20.)
- x4   addition nape to hip in mm (0.)
- x5   reduction waist in mm (20.)
- x6   reduction hip in mm (20.)
- x7   addition ½ across back in mm (20.)
- x8   raise neck at shoulder in mm (20.)
- x9   ease for shoulder width in mm (15.)
- x10   shoulder angle in mm (15.)
- x11   armhole curve point in mm (7.)

Z values with the value in size 38:

$z01 = g7 + x2$ 215.0
    nape to scye + addition

$z02 = g8 + x3$ 436.0
    nape to waist + addition

$z03 = g9 + x4$ 622.0
    nape to hip + addition

$z04 = g13 + x7$ 185.0
    across back + addition

$z05 = g14*2/3$ 62.0
    2/3 armhole diameter

$z06 = g16 + x9$ 137.0
    shoulder width + ease