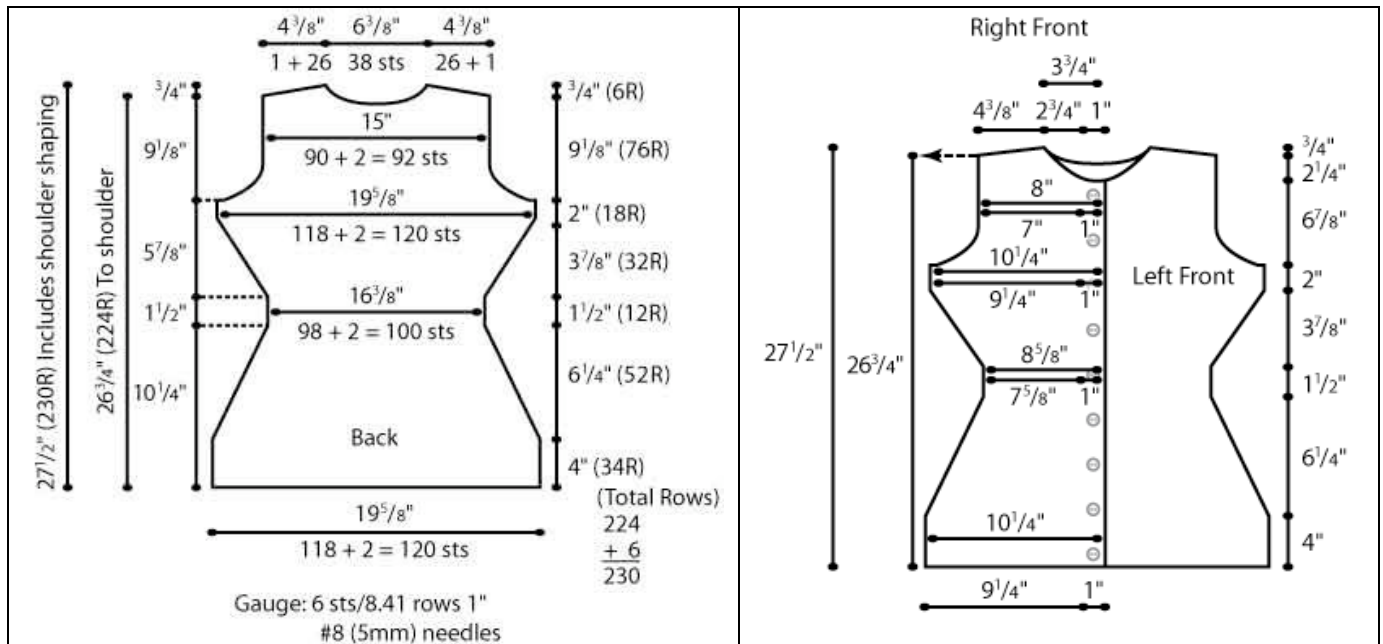


Designing a Buttoned Front Jacket

The following are the calculations and worksheets for designing the body of this cardigan with a double tapered silhouette. The cardigan features a high round neck with back neck shaping and a 1" overlap and nine buttons.



MEASUREMENTS FOR SCHEMATIC CALCULATIONS

Hips, Waist and Bust Measurement include 2" of ease.

Widths

- Hips: $39\frac{1}{4}''$ ($19\frac{5}{8}''$ Front/Back)
- Waist: $32\frac{3}{4}''$ ($16\frac{3}{8}''$ F/B)
- Bust: $39\frac{1}{4}''$ ($19\frac{5}{8}''$ F/B)
- Crossback: $15''$
- Neck: $6\frac{3}{8}''$
- Each Shoulder $4\frac{3}{8}''$

Lengths

- Work Even, $4''$
- Hip to Waist: $6\frac{1}{4}''$
- Waist: $1\frac{1}{2}''$
- Waist-to-Bust: $3\frac{7}{8}''$
- Even at Bust: $2''$
- Armhole-to-Neck: $6\frac{7}{8}''$
- Neck Depth: $2\frac{1}{4}''$
- Shoulder Shaping: $\frac{3}{4}''$
- Back Neck Depth: $\frac{3}{4}''$

CALCULATION PREPARATION

SWATCH MEASUREMENTS AND GAUGE CALCULATION

30 Sts = 5" W $30 \div 5 = 6 \text{ Sts} = 1"$

42 Rows = 5"L $42 \div 5 = 8.4 \text{ Rows} = 1"$

Stitch Pattern: Multiple of 4 + 2

WIDTHS (Use Stitch Gauge + 2 Side Selvage Stitches)

Stitch Gauge: 6 Sts. = 1"

Pattern Multiple: (4 + 2) + 2 selv sts

Measurements include ease allowance. There are 6 **width measurements**.

1.	Hips	Half of Hip Measurement	$19 \frac{5}{8}'' \times 6 =$	$118 + 2 =$	120 Sts
2.	Waist	Half of Waist Measurement	$16 \frac{3}{8}'' \times 6 =$	$98 + 2 =$	100 Sts
3.	Bust	Half of Bust Measurement	$19 \frac{5}{8}'' \times 6 =$	$118 + 2 =$	120 Sts
4.	Crossback	Shoulder-to-Shoulder	$15'' \times 6 =$	$90 + 2 =$	92 Sts
5.	Neck	Neck Measurement	$6 \frac{3}{8}'' \times 6 =$	38 + 0 =	38 Sts
6.	Shoulder	Divide remaining Crossback sts in half after Neck is subtracted	$4 \frac{3}{8}'' \times 6 =$	$26 + 1 =$	27 Sts

LENGTHS (Use Row Gauge)

Row Gauge: 8.4 Rows = 1"

There are 9 Length Measurements

			Math Double Check
A.	Work Even	$4'' \times 8.4 = 34 \text{ Rows}$	34
B.	Hip-to-Waist	$6 \frac{1}{4}'' \times 8.4 = 52 \text{ Rows}$	52
C.	Waist	$1 \frac{1}{2}'' \times 8.4 = 12 \text{ Rows}$	12
D.	Waist-to-Bust	$3 \frac{7}{8}'' \times 8.4 = 32 \text{ Rows}$	32
E.	Even at Bust	$2'' \times 8.4 = 18 \text{ Rows}$	18
F.	Armhole-to-Neck	$6 \frac{7}{8}'' \times 8.4 = 58 \text{ Rows}$	58
G.	Neck Depth	$2 \frac{1}{4}'' \times 8.4 = 18 \text{ Rows}$	18
H.	Shoulder Shaping	$\frac{3}{4}'' \times 8.4 = 6 \text{ Rows}$	6
I.	Back Neck Depth	H & I Worked together	Row worked with Shoulder shaping
J.	Total Length	$27 \frac{1}{2}'' \times 8.4 = 230 \text{ Rows}$	230

Write these numbers on the schematic.

Because this garment will have overlapping Fronts that are based on the Back measurements a careful summary calculation is necessary. Close attention must be given to each width.

Garment is worked with one selvage st on each side.

SUMMARY CALCULATION – WIDTHS

Must balance Gauge and Stitch Pattern Multiple with Body measurements and ease allowance.

BACK

1. Hips

Cast on – $19 \frac{5}{8}'' \times 6 = 117.75$ sts round to 118 sts + 2 = **120 Sts**

Pattern Multiple Check: $4 \times 29 = 116 + 2 = 118 + 2$ selv sts = **120 Sts**

Working the Method

Work even on these Sts for **4" = 34 Rows** ($4 \times 8.4 = 34$). Then **decrease to the waist width over 6 ¼" = 52 rows** ($6.25 \times 8.4 = 52$)

2. Waist

$16 \frac{3}{8}'' \times 6 = 98$ sts + 2 = **100 Sts.**

Decrease 20 sts from Hip-to-Waist = 10 sts on each side (20 ÷ 2) over 52 rows.

Working Method

On the first row after working even for 34 rows, decrease 1 stitch at each end. There will be 9 remaining stitches to decrease on each side. One row of the 52 rows between the end of the work even section and the waist will have been used. There are 51 rows remaining to work the 18 decrease stitches. Using the Shaping Formula, plan the decrease schedule following the calculations below.

3. Hip-to-Waist Shaping

Stitches

10 sts Decreased each side

- 1 st on first shaping row (each side)

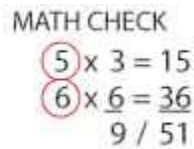
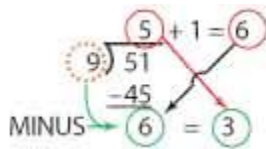
9 sts decreased each side over 51 rows

Rows

52 total Dec round

- 1 First Dec Row

51 rem shaping rows



Formula Translation

Decrease 1 stitch (inside the side selvage sts) on each side of the first row, then on each side of every following 5th row 3 times, then on each side of every following 6th row 6 times = 100 sts.

Work even on these 100 waist stitches for 12 rows (1½").

4. Waist-To-Bust Shaping

Increase from 100 waist stitches to 120 bust stitches: $120 - 100 = 20$ sts ÷ 2 = **10 sts to increase on each side.** The **first increase** should be made on the row following the 12 waist rows. The **last increase** will be made **2" below the first armhole bind off.** The last 2" will be worked even. Plan and work the shaping formula as in the hip-to-waist shaping, only increasing vs. decreasing. Work as below.

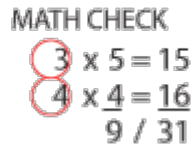
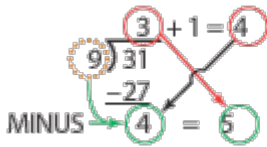
Total Bust rows: $5 \frac{7}{8} \times 8.4 = 50$
 Final "Work Even" rows: $2 \times 8.4 = 18$ (rounded even)
 Total Shaping rows: $3 \frac{7}{8} \times 8.4 = 32$

Stitches

10 sts increased each side
 -1 st on first shaping row (each side)
 9 sts to Inc each side over 31 rows

Rows

32 shaping rows
 -1 first inc row
 31 rem shaping rows



Formula Translation

Increase 1 stitch (inside the side selvage sts) on each side of the first bust shaping row, then on each side of every following 3rd row 5 times, then on each side of every following 4th row 4 times = **120 sts.**

Work even for 18 rows (2"). Piece should measure $17 \frac{5}{8}$ "

5. Crossback

$15 \times 6 = 90$ sts + 2 = 92 sts

6. Armhole Shaping

Bust width: $19 \frac{5}{8} \times 6 = 118 + 2$ selv = 120 sts

Crossback width: $15 \times 6 = 92 + 2$ selv = 92 sts
 28 sts
 $\div 2$

Armhole Decrease each side 14 sts

ARMHOLE SHAPING SCHEDULE							
Shaping Row #	/	# Sts Decreased		Shaping Row #	/	# Sts Decreased	
		RSRs	WSRs			RSRs	WSRs
1	-	4		9	-	1	
2	-		4	10	-		1
3	-	3		11	-	1	
4	-		3	12	-		1
5	-	2		13		<u>1</u>	
6	-		2	14			<u>1</u>
7	-	2			-	14	+ 14 = 28 stitches over 14 rows
8	-		2				

7. Neck Opening (42% of Crossback width)

$15 \times 42\% = 6 \frac{3}{8}$ "

$6 \frac{3}{8} \times 6 = 38$ stitches

8. **Shoulder Width**

$$\begin{array}{r}
 \text{Crossback} = 90 + 2 \text{ selv} = 92 \text{ sts} \\
 \text{Neck Opening} \quad - 38 \text{ sts} \\
 \text{Shoulders} \quad \quad \quad 54 \text{ sts} \\
 \quad \quad \quad \quad \quad \quad \div 2 \\
 \quad \quad \quad \quad \quad \quad 27 \text{ sts (26 + 1 selv)}
 \end{array}$$

MATH CHECK

$$\begin{array}{r}
 \text{Shoulder} \quad \quad \text{Neck} \quad \quad \text{Shoulder} \quad \quad \text{Cross Back} \\
 1 + 26 \quad + \quad 38 \quad + \quad 26 + 1 \quad = \quad 90 + 2
 \end{array}$$

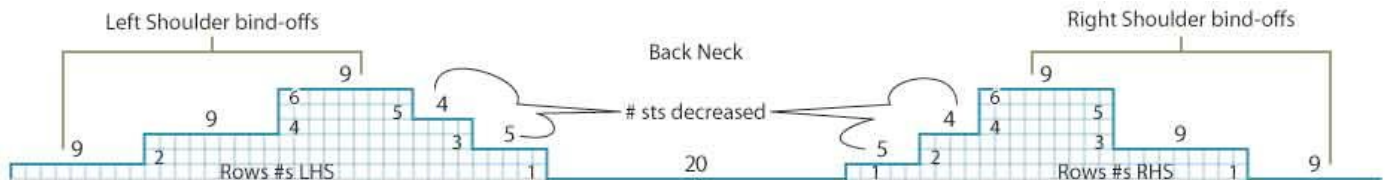
When piece measures 26¾" shape shoulders and back neck over ¾" = 6 Rows. Work as below.

Shoulders: 6 ÷ 2 = 3 Bind off rows each side
 27 stitches ÷ 3 = **9 sts** in each bind off

9. **Back Neck Shaping**

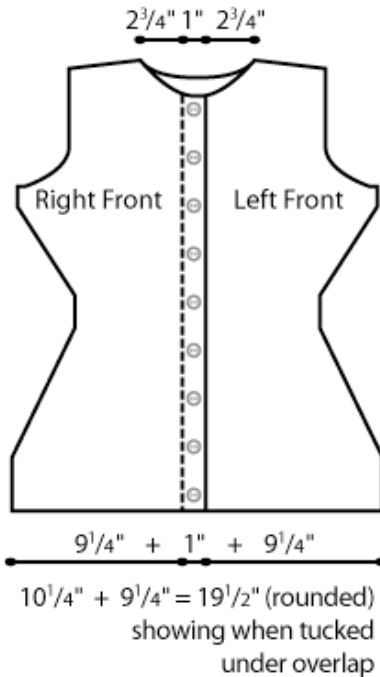
Begin by dividing the neck stitches in half for the Center Neck bind off.
 Side Neck Shaping is worked over 2 levels.

- a. 38 sts ÷ 2 = 19 – round even to **20 center neck sts**
- b. 38 – 20 = **18 side neck sts**
- c. 18 ÷ 2 = **9 sts in each side neck**



FRONTS

Each front neck $3\frac{3}{4}" \times 6 = 23$ sts



50 sts sts crossback
 $- \frac{23 \text{ sts}}{23 \text{ sts}}$ neck
 27 sts shoulders

1. Back Width

Overlap $19\frac{5}{8}" \div 2$
 $9\frac{3}{4}" + \frac{1}{2}" = 10\frac{1}{4}"$ overlapping side (Rounded to nearest $\frac{1}{8}"$)
 $9\frac{3}{4}" - \frac{1}{2}" = 9\frac{1}{4}"$ underlapping side (Rounded to nearest $\frac{1}{8}"$)
 $19\frac{1}{2}"$ Each Front (Math Check for Back Width)

2. Hips

Check multiples after stitches decreased.

Pattern Multiple check: $4 \times 15 = 60 + 2 = 62 + 2 \text{ selv} = 64 \text{ sts}$

3. Waist

Side decreases must match Back
 $64 - 10 = 54 \text{ sts}$ (including selv. sts)

4. Bust

Side increases must match Back
 $54 + 10 = 64 \text{ sts}$ (including selv sts)

5. Crossback

Armhole decreases on each side must match Back
 $62 + 2 = 64 - 14 = 50 \text{ sts}$

6. Neck

Back Neck = $6 \frac{3}{8}'' \times 6 = 38$ sts

Overlap $6 \frac{3}{8}''$

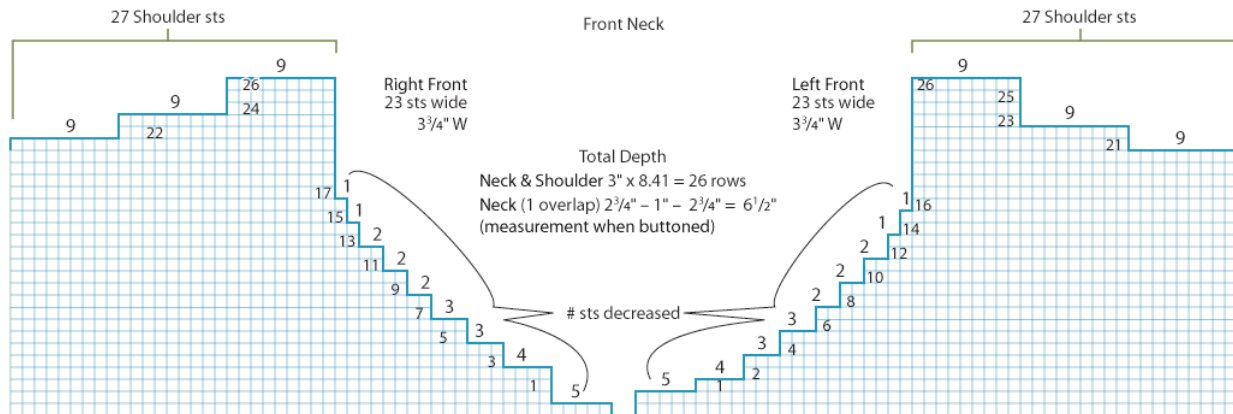
$\div 2''$

$3 \frac{1}{4}'' + \frac{1}{2}'' = 3 \frac{3}{4}'' \times 6 = 23$ sts

$3 \frac{1}{4}'' - \frac{1}{2}'' = 2 \frac{3}{4}''$

$6 \frac{1}{2}''$ (rounded to nearest $\frac{1}{8}''$)

Each Front $3 \frac{3}{4}'' \times 6 = 23$ sts



BUTTONHOLE PLACEMENT

Rows to Beginning of Neck

Total Length - Neck Depth = Inches to Beginning of Neck

$27 \frac{1}{2}'' - 3'' = 24 \frac{1}{2}'' \times 8.4$ (row gauge) = **206 Rows**

First Buttonhole placed $\frac{3}{8}''$ from the Bottom

$8.4 \div 3.375 =$ **Row #3**

Last Buttonhole placed $\frac{3}{8}''$ from top of Neck

$206 - 3$ rows = **Row #203**

Using the Shaping Formula work calculations as follows:

Total Buttonhole Rows = 206

- 6 rows used for bottom and top buttonhole placement

200 Rows

Place 8 buttonholes evenly along 200 rows. The first will be counted as placed = 8 remain. The last hole will be made on row #203.

$200 \div 8 = 25$ rows apart for each of the 8 buttonholes. **Note:** using a one row buttonhole that can be worked on both WSRs and RSRs.

Row #: $3+25 = 28+25 = 53+25 = 78+25 = 103+25 = 128+25 = 153+25 = 178+25 = 203$

Buttonhole#: 1 2 3 4 5 6 7 8 9

Work even through row #206