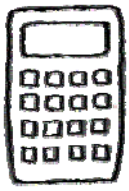
Math For Knitters



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B. Mathematics, Pure Math
University of Waterloo, 1992

Math: it's everywhere…

Increase 5 stitches evenly across the next round.

Place 7 buttonholes evenly distributed along button band.

Pick up and knit 3 stitches for every 4 rows, making sure you end up with a multiple of 4 sts plus 2.

Yarn Shop Math

1 yard = .9 meter

- To convert yds to m, multiply by .9.
- To convert m to yards, divide by .9.

1 cm= .4 inch

- To convert inches to cm, multiply by .4
- To convert cm to inches, divide by .4

Yarn Shop Math

Buy yarn by length, not weight

- Cascade 220 – 100g = 220yds
- Spud & Chloe Sweater – 100g = 160yd

Buy yarn by length, not number of balls

- Paton's Canadiana – 100g = 187m
- Paton's Canadiana Tweeds – 85gm = 174m

Pattern Math

Increases, decreases and buttonholes, Oh My!

"Evenly spaced"

Increase 6 sts evenly spaced across 30 stitches of current round.

Place 7 buttonholes evenly spaced across 86 stitches of current row.

Decrease 5 sts evenly spaced across 56 stitches of current row.

Increasing

Increase 6 stitches evenly spaced across 42 stitches of current *round*.

42 ÷ 6 = 7

Increase round: (K7, m1) 6 times.

Increase 6 stitches evenly spaced across 42 stitches of current *row*.

Increase row: (K7, m1) 6 times.

K4 , m1, k7, m1, k6 , m1, k7, m1, k7, m1, k7, m1, k4

Increasing

Increase 5 stitches evenly spaced across 58 stitches of current row.

58 ÷ 5 = 11.6

5 x 11 = 55, with 3 left over

K11, m1, k11, m1, k11, m1, k11, m1, k11, m1, k3.

To distribute better, steal a few sts from the start & put them at the end.

Increase row:

K7, m1, k11, m1, k11, m1, k11, m1, k11, m1, k7.

Decreasing

Decrease 5 evenly spaced across 60 stitches of current *row*.

60 ÷ 5 = 12

K10, k2tog, k10, k2tog, k10, k2tog, k10, k2tog, k10, k2tog.

To distribute better, steal a few sts from the start & put them at the end.

K5, k2tog, k10, k2tog, k10, k2tog, k10, k2tog, k10, k2tog, k5.

K5, k2tog, (k10, k2tog) 4 times, k5.

Buttonholes

Place 5 evenly spaced across 60 stitches of current *row*.

60 ÷ 5 = 12

K10, BH, k10, BH, k10, BH, k10, BH, k10, BH.

To distribute better, steal a few sts from start & put them at the end.

K5, BH, k10, BH, k10, BH, k10, BH, k10, BH, k5.

K5, BH, (k10, BH) 4 times, k5.

Gauge & Garment Math

Gauge

18 sts/24 rows

CO 1.5-2x sts
Work to 6 inches
Measure
Block
Measure

If you don't match gauge… It won't fit!

Pattern calls for 18 sts/4 inches
Making the size with the 40-inch chest

At 20 sts/4 inches

Finished sweater is 36"

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18 sts/20 sts = .9
40 x .9 = 36 inches
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At 16 sts/4 inches

Finished sweater is 45"

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18 sts/16 sts = 1.125
40 x 1.125 = 45 inches
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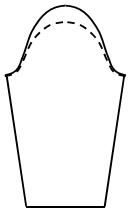
Row Gauge Matters, Too

Pattern gauge: 5 rows/inch
Knitter's gauge: 5.75 rows/inch

Sleeve cap shaping takes place over 28 rows



- At pattern gauge, cap shaping covers 5 ¾ inches
- At knitter's gauge, cap shaping covers 4 ¾ inches

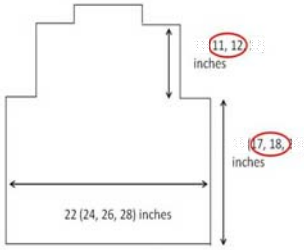
So Just Knit A Different Size.

"Cheesy Puffs"
- Pattern gauge = 13 sts
- Knitter's gauge = 14 sts
- Aiming for 48 inch chest

Size M as written = 48 inch chest
Size M worked at new gauge
= 48 x (13/14) = 44.5 inches

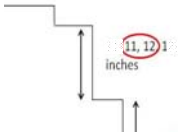
Size L as written = 52 inch chest
Size L worked at new gauge =
52 x (13/14) = 48 inch chest

Issue #1: Length is Wrong

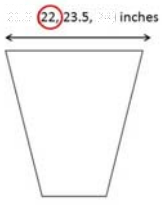


If you follow L instructions, you'll get L lengths.

Issue #2: Sleeves Won't Fit Into Armholes



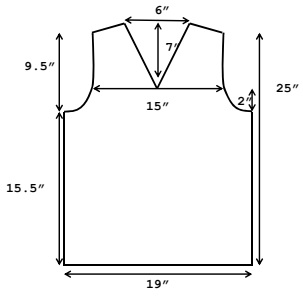
M armhole is 11 inches deep – requires sleeve 22 inches around.



At new gauge, L sleeve is 21 inches around….

Doing It Right

Figure out the measurements and do the math...



The Gauge Adjustment "Degree of Difficulty" Index

Math-free
- Triangular, circular, semi-circular shawls

Easy math
- Unshaped pieces – scarves, cowls, blankets
- Hats

Less Easy But Still Doable
- Minimally shaped pieces where fit doesn't matter
- Unshaped garments – drop shoulder

Essentially designing a new garment
- Garments with shaping & fit

What if you *don't* want to do math?

Shop for Patterns Differently

The Bones
- Construction
- Gauge
- Size
- Armhole shaping
- Neckline
- Fabric type
  - Plain vs. cables vs lace vs. colourwork

The Decorations
- Color, stripes
- Edgings
  - Ribbing/garter/seed…
- Finishes
  - Buttons, zippers, …
  - Collar size/shape

Minor Alterations
- Body length & shaping
- Sleeve length & shaping

Garment Alterations "Degree of Difficulty" Index

Math-free
- Change color
- Add stripes
- Change edgings, finishes

Easy
- Adjust body length
- Adjust body shaping
- Adjust sleeve length

Less Easy But Still Doable
- Bust darts
- Adjust neckline depth, style
- Pattern stitches w/o gauge change

Essentially designing a new garment
- Creating a new size
- Changing gauge
- Pattern stitches with gauge change

Even designers find this challenging
- Changing armhole/sleeve cap construction

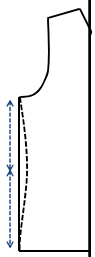
Adjusting Body Length and Shape: The Concept

Measure:
Distances from underarm to waist, from hem to waist

Decide:
Desired waist circumf = actual waist + ease

Calculate
Waist sts = waist circumference x sts per inch
Sts to shape between hem & waist
Sts to shape between waist & underarm
rows between hem & waist, between waist & underarm

Distribute Shaping
Between hem & waist; between waist & underarm.



"Distribute Shaping"

Decrease 5 times within 60 rows.

60 ÷ 5 = 12.
Decrease every 12th row, 5 times.

(Decrease row, 11 even rows) 5 times.

6 even, (decrease row, 11 even) 4 times, decrease, 5 even.

Thank you!

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