Materials

Yarn

Cascade 220

Notions

Crochet hook

Gauge

Abbreviations

Pattern

$$C = 2\pi R \sinh(r/R)$$

$$C = \pi R(e^{r/R} - e^{-r/R})$$

- R is the radius of the hyperbolic plane to be crocheted (radius of the annuli)
- r is the intrinsic radius of a circle (intrinsic meaning measured along the surface of the hyperbolic plane; a symmetric hyperbolic plane will consist of crocheting "concentric" intrinsic circles)
- C is the intrinsic circumference of a circle with intrinsic radius r on a hyperbolic plane with radius R
- sinh is the hyperbolic sine function

Since r depends on the height of a crocheted row h, the intrinsic radius of the nth row is $r_n = nh$. For each row, the intrinsic circumference $C(n)$ is

$$C(n) = \pi R(e^{nh/R} - e^{-nh/R})$$

The ratio $C(n)/C(n-1)$ determines how to increase stitches. This needs to be a fraction of the form $(k+1)/k$ to crochet the plane. The number of stitches in the nth row is determined by $S(n) = C(n)/w$, where w is the width of one stitch.

Constants:
$R = 8.0$ cm
$h =$ SOMETHING
$w =$ SOMETHING

n	$C(n)$	$C(n)/C(n-1)$	Nearby fractions	Increase ratio	$S(n)$	increases
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						