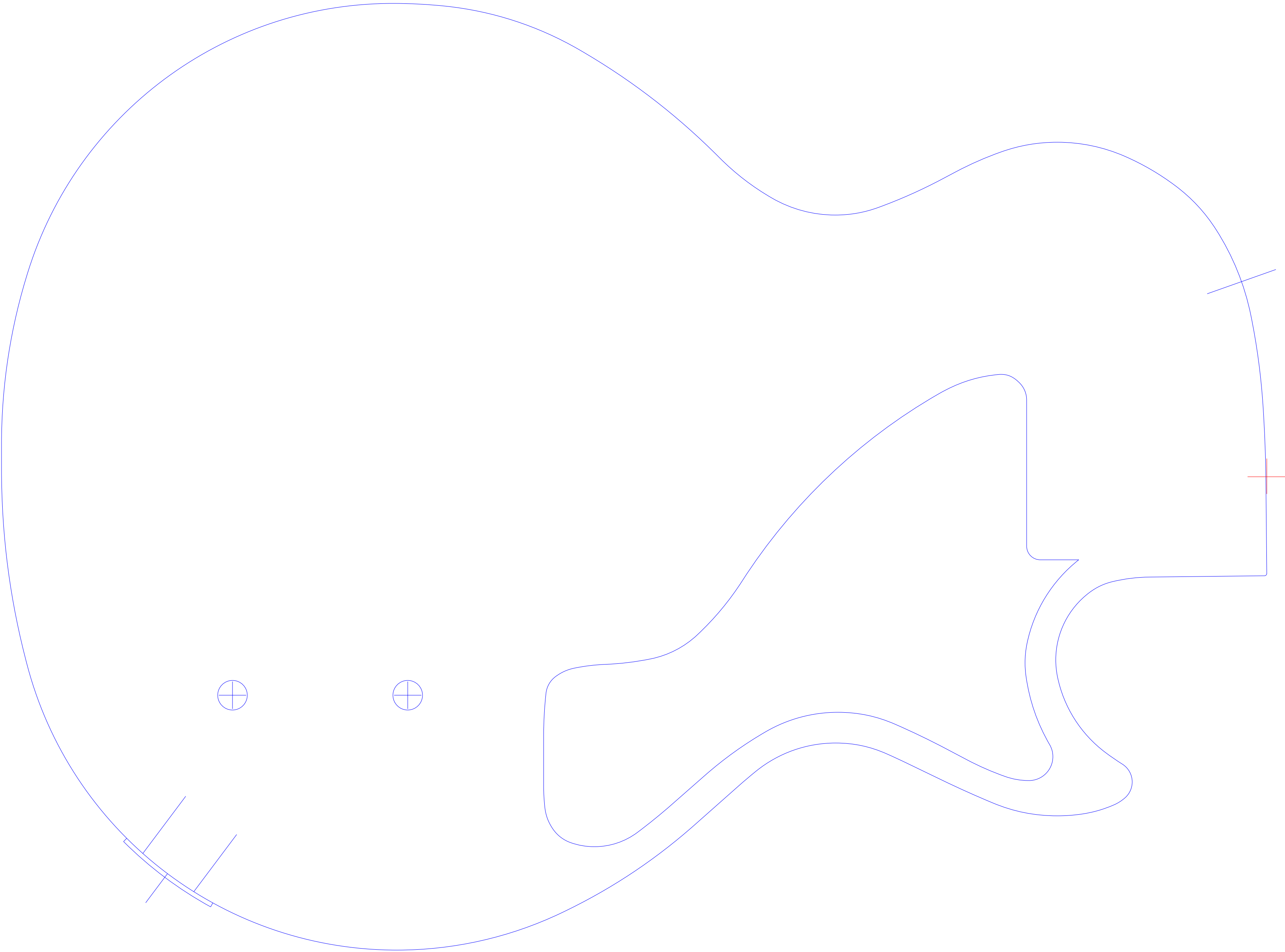


end result



body over tracing scan @ 150 d.p.i. - each dot = 0.0066..." square.

scan reduced in size from 12 pixels over 13" inside lines at the hips to exactly 13 inside lines to compenste for pencil width

the proportional scaling brought the overall length from 3 pixels shy of 17.5" to 17.375... which is what was expected

all in all, a 5/128ths inch gap between edge and pencil line

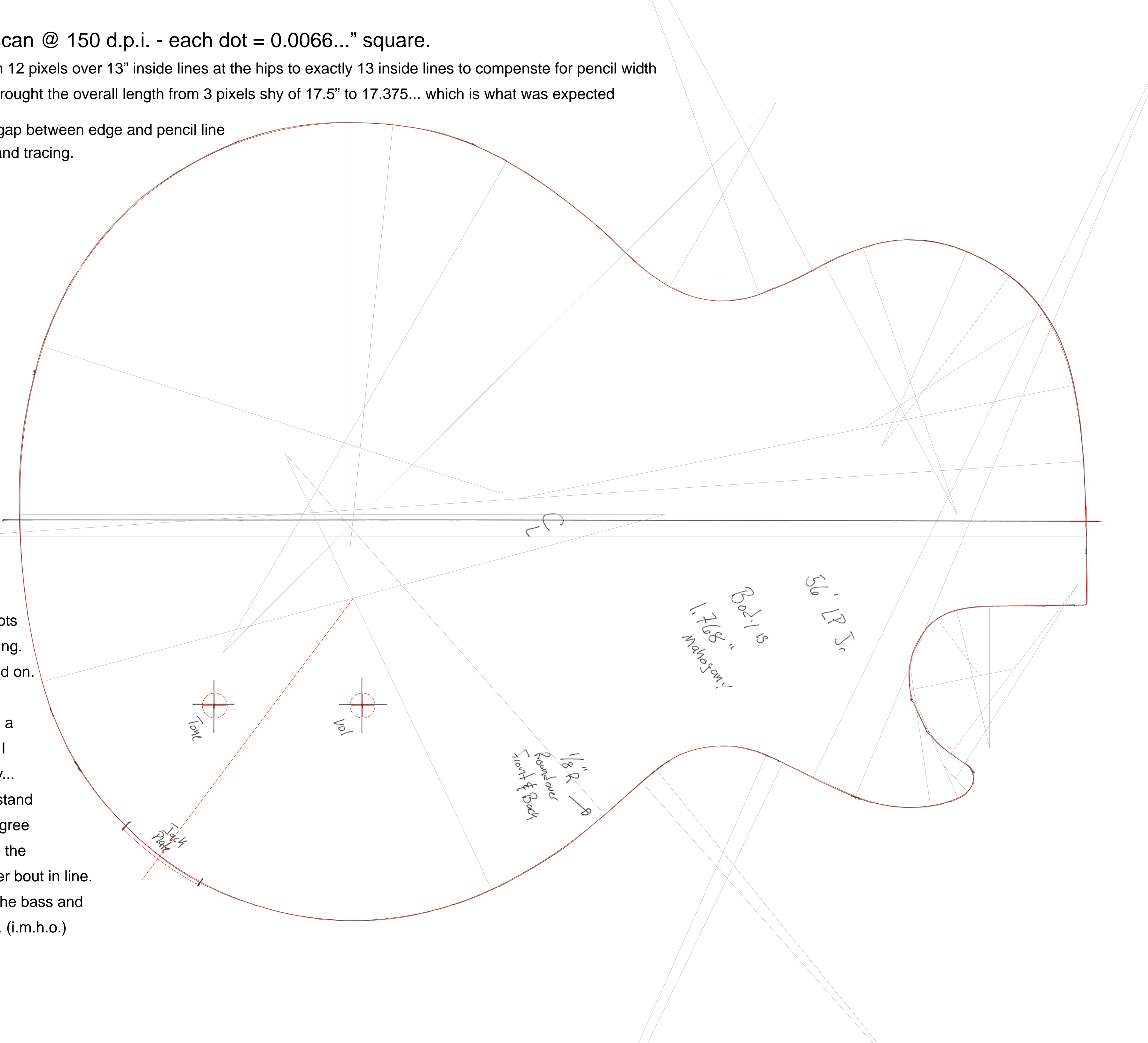
ain't half bad for a free hand tracing.

if you don't zoom all the way to 64x magnification and pay attention to the general trend of the line, you'll notice changes in the angle of the pencil ...sometimes gradual ...sometimes abrupt.

without a means to keep the lead close and perpendicular, angling is pretty much unavoidable... unless you're a human c.m.m.

on screen, the center line at the butt end and the vertical markers for the pots are all 1/64th high = nothing. the neck pocket c/l is dead on.

because it was already in a compressed jpeg format, I didn't want to rotate it any... though it could probably stand 3 to 4 hundredths of a degree counterclockwise to bring the outside edges of the upper bout in line. It's a pixel or two low on the bass and treble and in the cutaway. (i.m.h.o.)



reason: radius table

it's all done with simple arcs and straight lines... no french curves... no boat curves
no point handle editing / manipulation in drawing programs, etc...

the key to this technique is in using a radius table similar to the one shown to the left.

the way it's set up, if you change the base radius, the ratios between the new radii will remain the same.
this consistency allows us to make use of another table that tells us how to make a graceful transitions (without any bumps or dimples) when stringing one size arc to another... but first, we need to make yet another table.

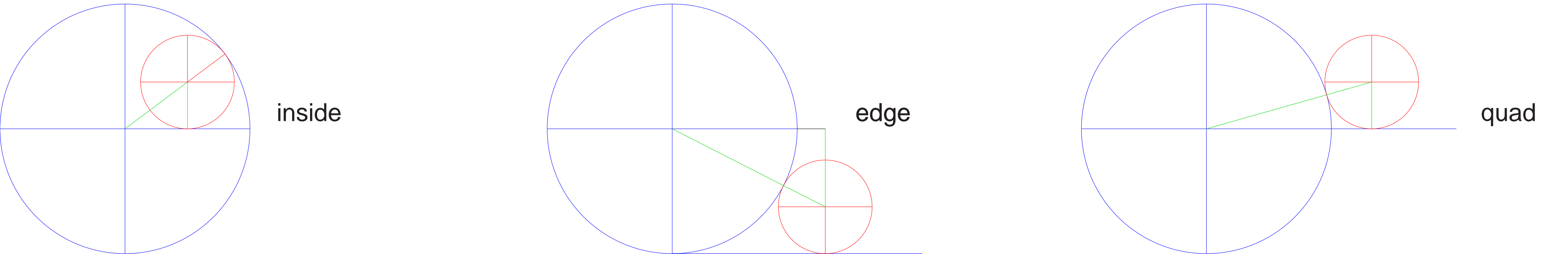
the radius table shows the ratio of all circles in relation to the base, but we also need to know the size ratio of every possible combination of two circles that can be chosen from the radius table.

	Radius
1/8 B	0.328125
3/16 B	0.4921875
1/4 B	0.65625
3/8 B	0.984375
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	10.5

	1/8 B	3/16 B	1/4 B	3/8 B	1/2 B	3/4 B	Base	1.5 B	2 B	3 B	4 B
1/8 B	1	1.5	2	3	4	6	8	12	16	24	32
3/16 B	0.66..	1	1.33..	2	2.66..	4	5.33..	8	10.66..	16	21.33..
1/4 B	0.5	0.75	1	1.5	2	3	4	6	8	12	16
3/8 B	0.33..	0.5	0.66..	1	1.33..	2	2.66..	4	5.33..	8	10.66..
1/2 B	0.25	0.375	0.5	0.75	1	1.5	2	3	4	6	8
3/4 B	0.166..	0.25	0.33..	0.5	0.66..	1	1.33..	2	2.66..	4	5.33..
Base	0.125	0.1875	0.25	0.375	0.5	0.75	1	1.5	2	3	4
1.5 B	0.83..	0.125	0.166..	0.25	0.33..	0.5	0.66..	1	1.33..	2	2.66..
2 B	0.625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.75	1	1.5	2
3 B	0.416..	0.625	0.83..	0.125	0.166..	0.25	0.33..	0.5	0.66..	1	1.33..
4 B	0.3125	.046875	0.625	0.09375	0.125	0.1875	0.25	0.375	0.5	0.75	1

thankfully, there's a lot of repetition in this new table... along with interesting left to right downward diagonal patterns.
...with both a 2 series (even) and a 3 series (odd) in the radius table, the ratio table shows (mixed) 2/3 and its multiples.

tangents... where 2 circles / arcs touch each other at only one point... that's what we're after... that's what makes for a proper transition.
but that's far too easy... just as we limited our choices of radii from infinite to a handful in a radius table, we're also going to limit the choice of an infinite number of tangent points by defining specific angles at which the two are to be tangent to each other given their size relationship.
those angles are defined by specific placement relationships of the 2... in these placements, their size ratio determines the angle -
the larger the new, the larger the angle



rhyme: trig free simplicity... "karma police, arrest this man... he talks in maths"

[click here for spreadsheet](#)
[save as excel or open office](#)

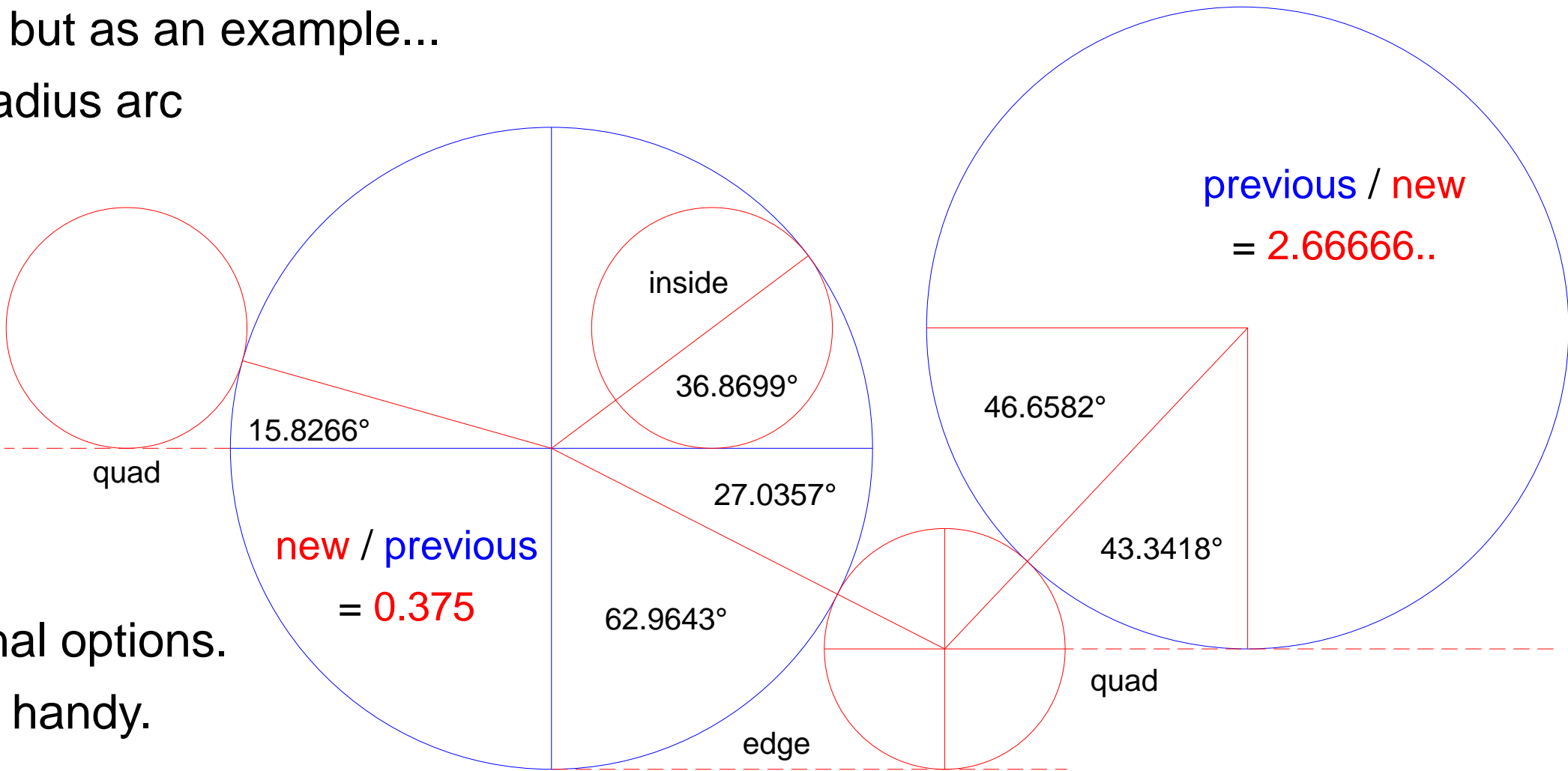
with the placement angle restrictions (design structure)... this table is the tool you want in your tool box.

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	51.0575°	45.5846°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	46.6582°	48.5903°	53.1301°
90 - i	81.7867°	78.4630°	76.6576°	70.5287°	60°	53.1301°	0°									
90 - e	38.9424°	44.4153°	46.8264°	53.1301°	60°	62.9643°	70.5287°	78.4630°	81.7867°	90°	81.7867°	78.4630°	70.5287°	62.9643°	60°	53.1301°
90 - q	83.6206°	81.7867°	80.9152°	78.4630°	75.5224°	74.1733°	70.5287°	66.4218°	64.6230°	60°	55.1501°	53.1301°	48.1896°	43.3417°	41.4096°	36.8699°

it's use: the recreations in the following pages will give you the idea, but as an example...

let's say the base in your radius table is 1". you've just drawn a 1" radius arc and want a 3/8 B radius next in the string. obviously, one ratio is 0.375, but you'll also want to reverse it... $1 / 0.375 = 2.66666...$

take the ratios to the table... the ratio used (**new** / **previous** or **previous** / **new**) doesn't matter. an angle in the column of one (sometimes both) of the ratios (or a multiple of that column) may be used. multiples are of the 2... 4... 8... 16... variety. counting every 3rd column from your ratios in the table shows you the additional options. the common use of multiples is why the table shines... it's downright handy.



the angle starts at the center of the previous arc and is measured from any one of its quad points... so each angle in the table gives 8 tangent points on a circle (clockwise and counterclockwise from each of the quad points). though not the norm, an angle can also be measured from a previous tangent point... there is only one example of this in the following pages. I'll surely rant when we get to it because that one angle cost me the better part of an hour wondering why things weren't lining up.

in cad, the new (drawn tangent to a quad point of the prev.) rotates from the center of the previous. by pencil, you'd draw the angle through the center of the previous 1st, measure and mark the new center on the angle line and then draw the new arc. getting the angle accurate by pencil isn't easy... it's a bit like making a guitar... there's a lot going on in the set-up that's not seen in the finished product. having the proper tools doesn't hurt either... whoever drafted this may have drawn it at double size and had it mechanically reduced.

the trick to finding the right base radius is that there isn't one. it's trial and error... though excel helps.

some might wonder, so the last page of this pdf shows the basis for how the angles were calculated in the spreadsheet.

Diameter = 5.25

Center = (-3.15625, -1.125)

Step by step - pick guard first, then body...

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

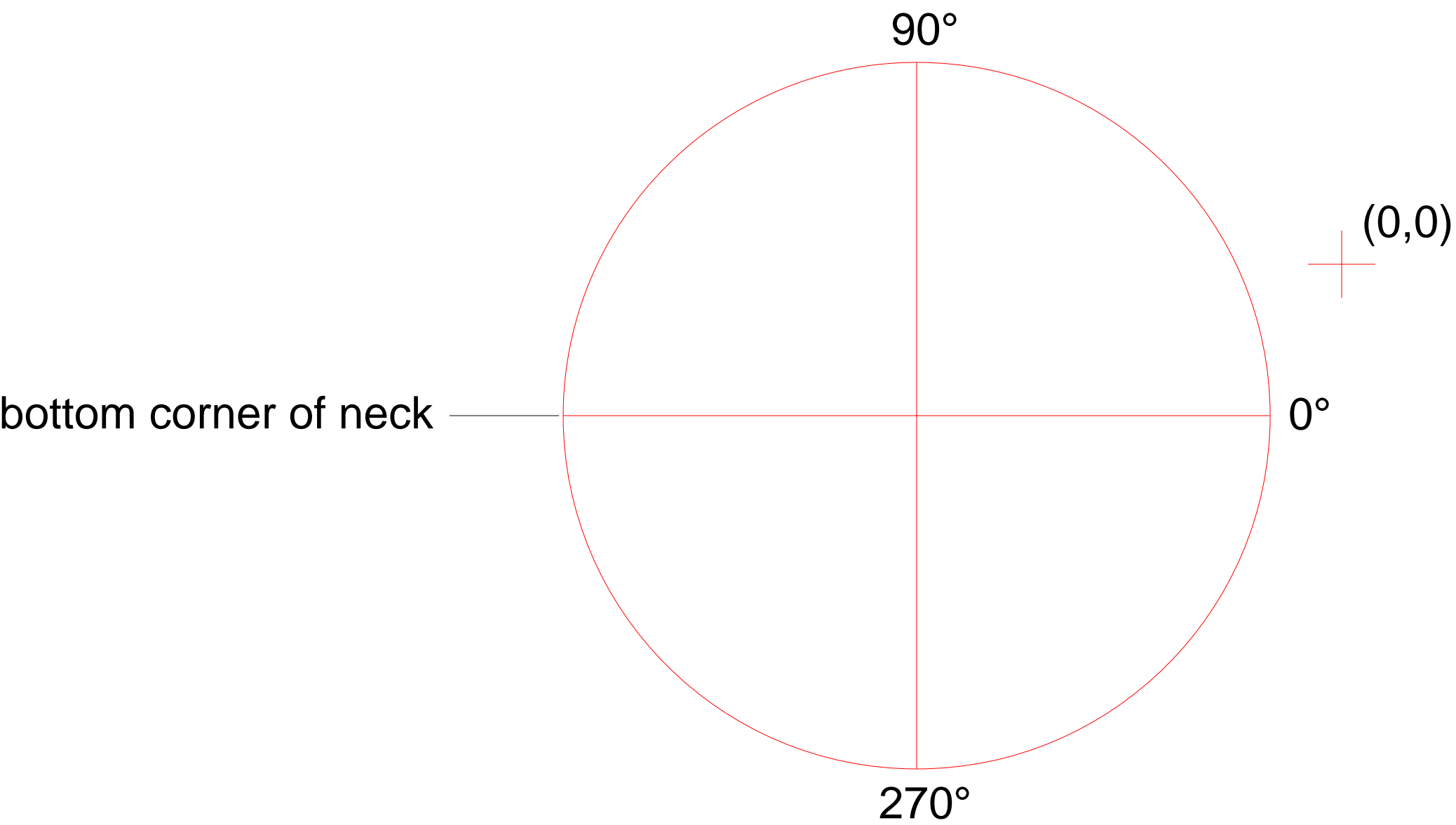
Base 2.625

1.5 B

2 B

3 B

4 B



note: this guard is a 1956... sometime in 57 <?>, they changed to a guard that was similar, but further from the outline of the lower body...
all of which is to say that the newer guard may have not been drawn by the same person / same technique as the original design.

Diameter = 15.75
Center = (-0.53125, -5.67163)
Angle = 120°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

Base 2.625

1.5 B

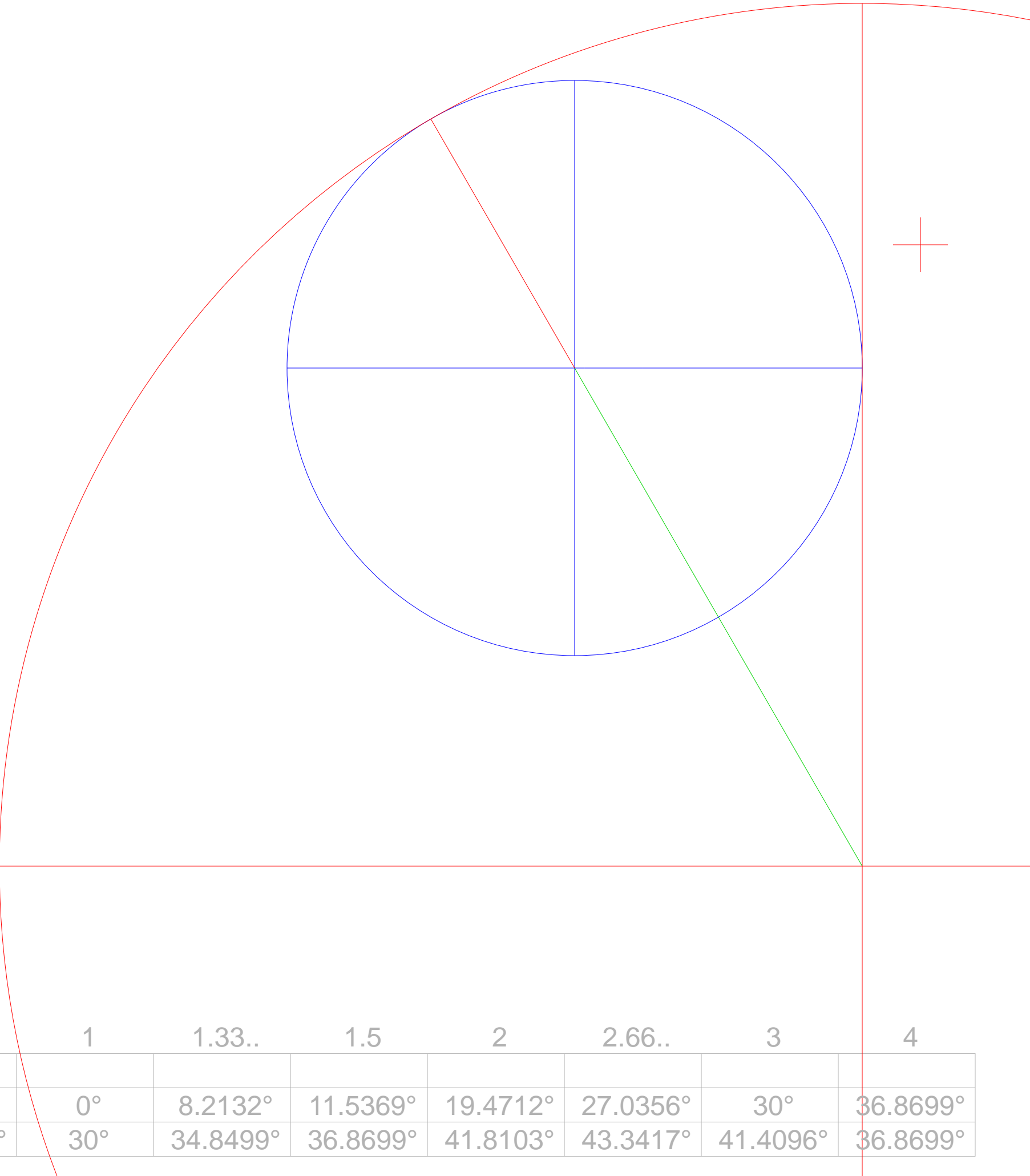
2 B

3 B 7.875

4 B

n / p = 3
p / n = 0.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



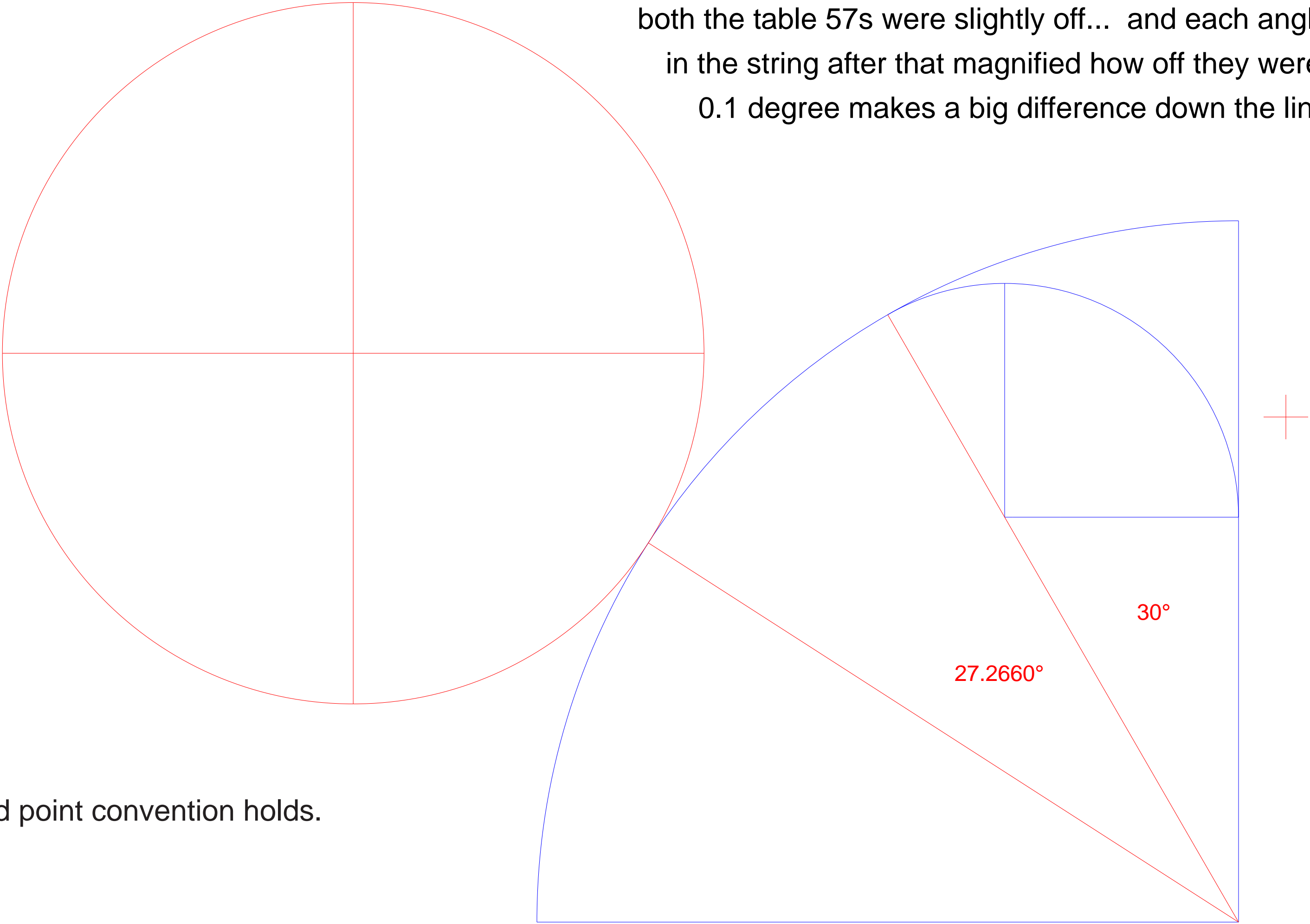
Diameter = 7.875
Center = (-10.4678, 0.715845)
Angle = 147.266°

- Radius
- 1/8 B
 - 3/16 B
 - 1/4 B
 - 3/8 B
 - 1/2 B
 - 3/4 B
 - Base 2.625
 - 1.5 B 3.9375
 - 2 B
 - 3 B 7.875
 - 4 B

the unwritten rule is that one measures a table angle from a quad point of the previous circle ...or so I thought.

drawing over the scan, it was clear the radius was right and that the angle was 57° & change. 57 appears twice in the table below @ 5.33.. and 12 (both shown localized as 32 & change), but neither relate to the calculated ratios here. One might be tempted to say 2 * 6 for the 12, but that doesn't conform to the 2... 4... 8... 16... every 3rd column pattern.

both the table 57s were slightly off... and each angle in the string after that magnified how off they were. 0.1 degree makes a big difference down the line



from here on, the quad point convention holds.

$n / p = 0.5$
 $p / n = 2 * 4 + 30^\circ$

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°

Diameter = 2.625
Center = (-8.67176, -1.19853)
Angle = 313.1735°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B

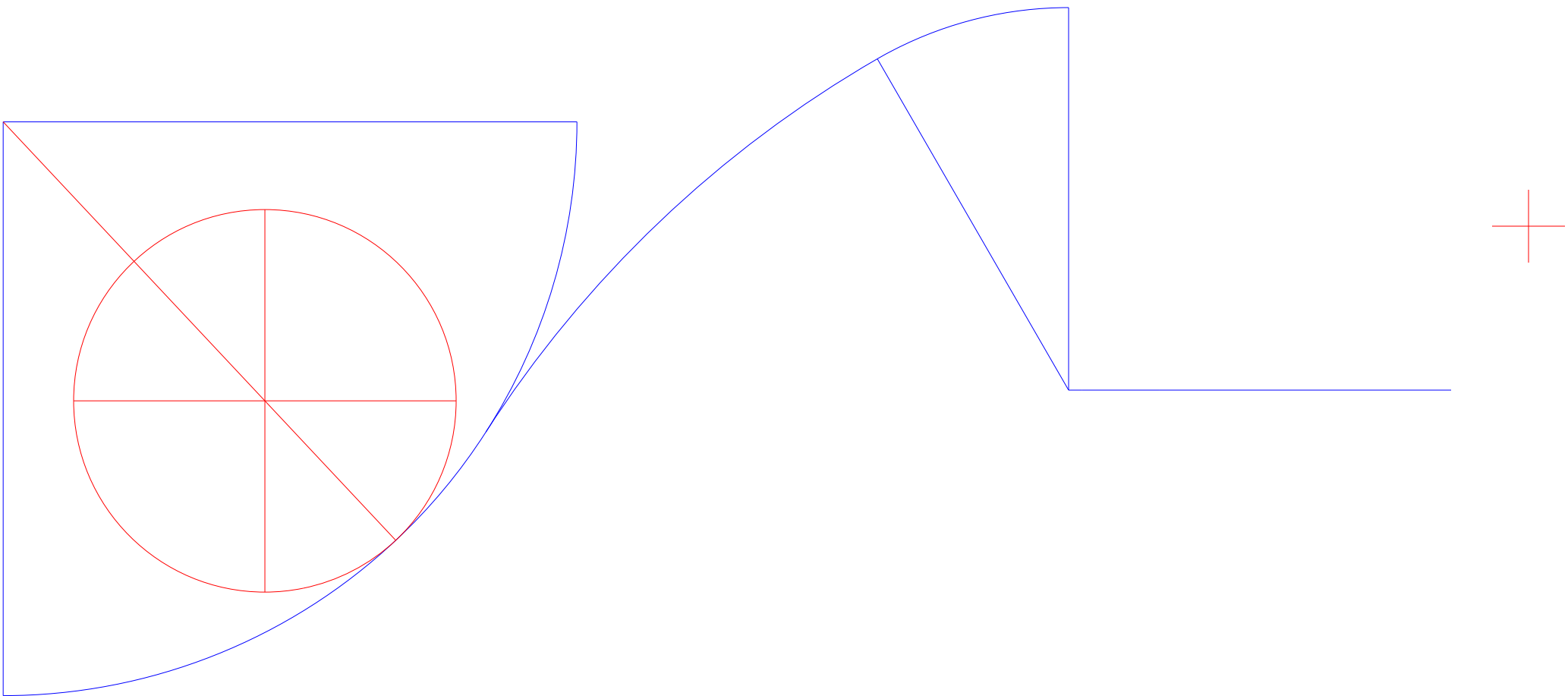
Base 2.625

1.5 B 3.9375

2 B

3 B 7.875

4 B



n / p = 0.33..
p / n = 3 /16

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 7.875
Center = (-9.19676, 1.37344)
Angle = 281.5369°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B

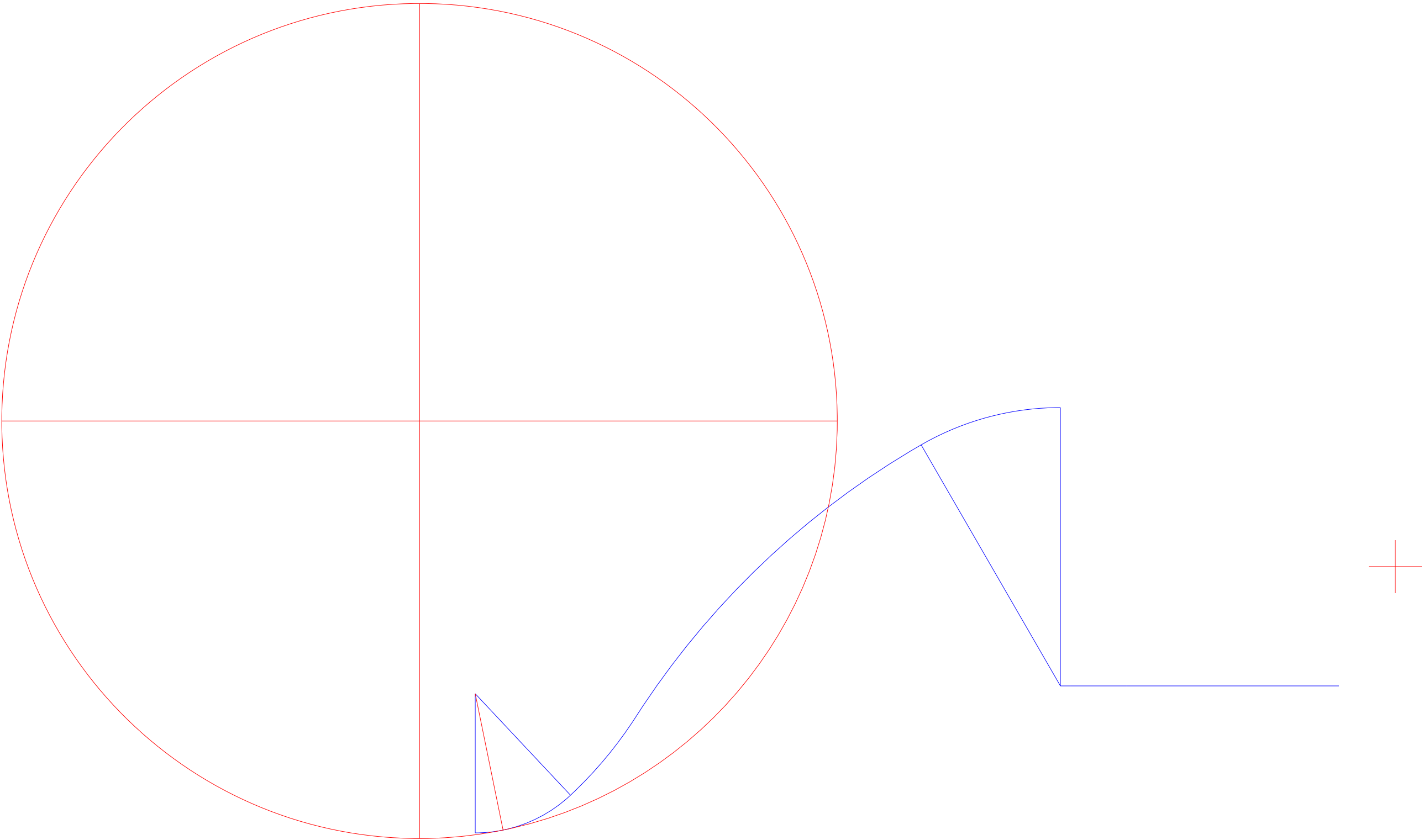
Base 2.625

1.5 B 3.9375

2 B

3 B 7.875

4 B



$n / p = 3$
 $p / n = 0.33.. /2$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 5.25
Center = (-8.93426, -5.18381)
Angle = 272.2924°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B

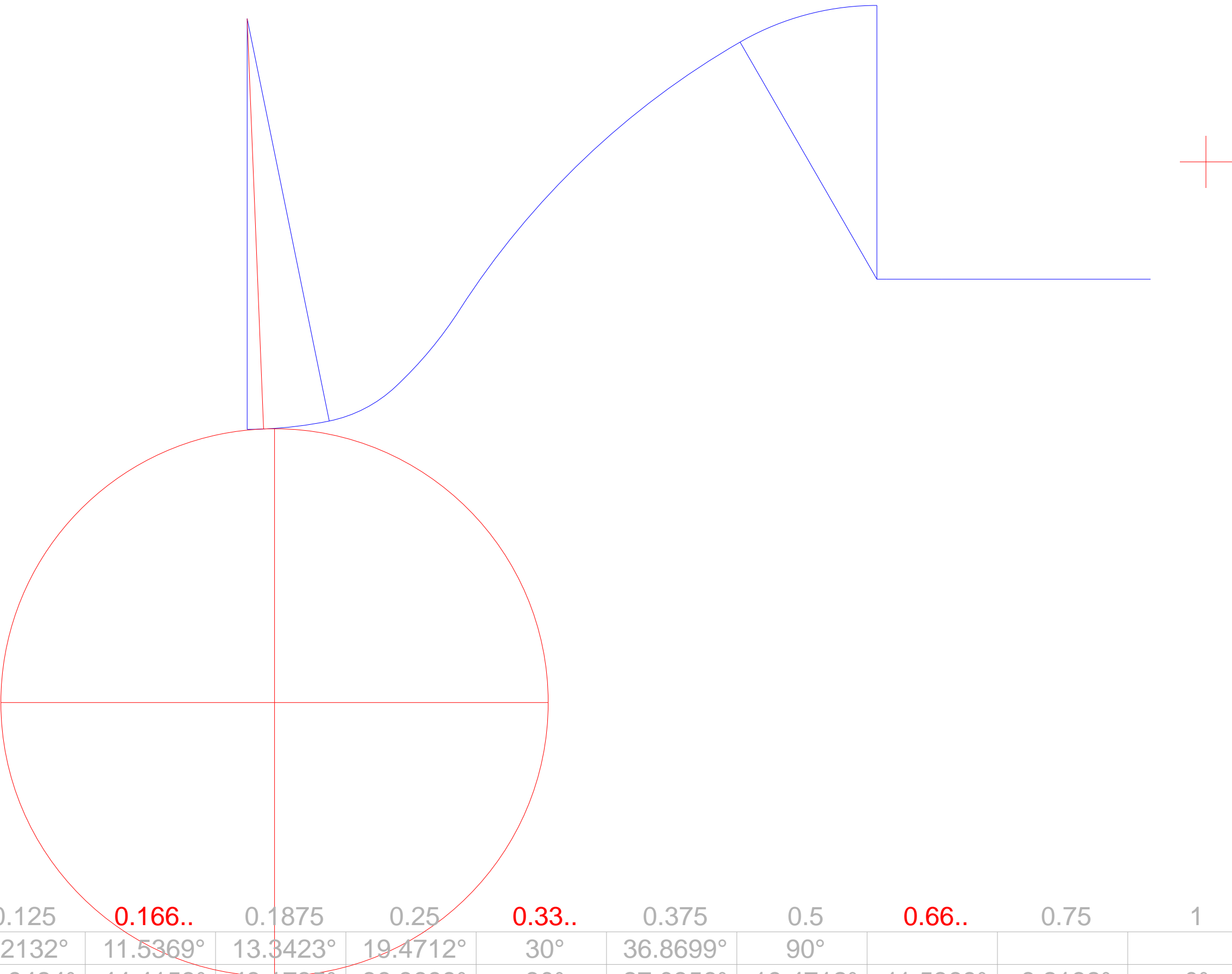
Base 2.625

1.5 B 3.9375

2 B

3 B 7.875

4 B



n / p = 0.66 /16
p / n = 1.5

ratio	0.03125	0.041666666666666666	0.046875	0.0625	0.083333333333333333	0.09375	0.125	0.16666666666666666	0.1875	0.25	0.33333333333333333	0.375	0.5	0.66666666666666666	0.75	1
inside	1.8485°	2.4919°	2.8189°	3.8225°	5.2159°	5.9377°	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°			
edge	20.0499°	23.0739°	24.4327°	28.0724°	32.2042°	34.0477°	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°
quad	1.7365°	2.2924°	2.5663°	3.3722°	4.4117°	4.9171°	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°

Diameter = 1.3125
Center = (-9.32802, -3.25484)
Angle = 101.5369°

- Radius
- 1/8 B

3/16 B

1/4 B 0.65625

3/8 B

1/2 B 1.3125

3/4 B

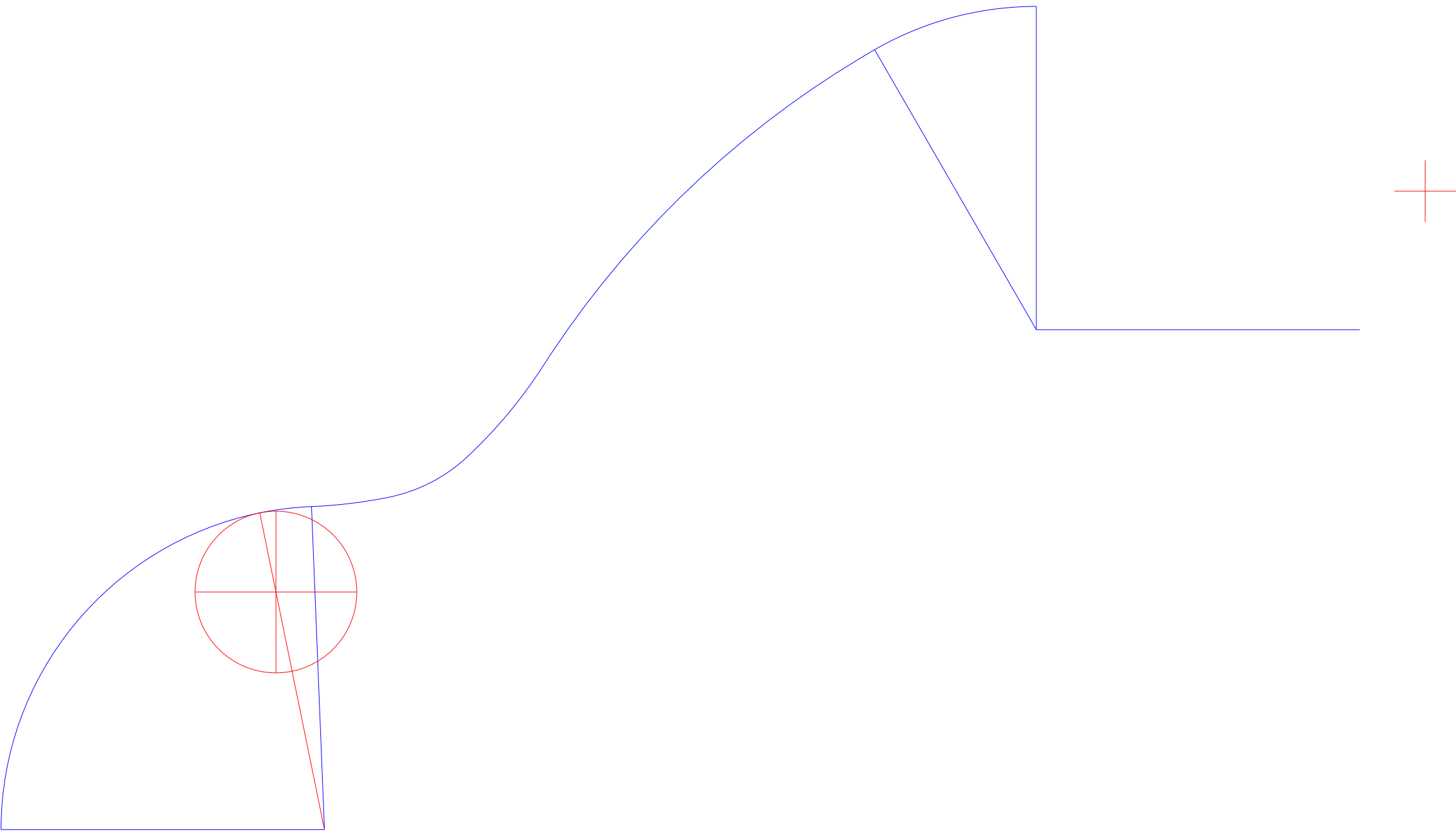
Base 2.625

1.5 B 3.9375

2 B

3 B 7.875

4 B



n / p = 0.25

p / n = 4

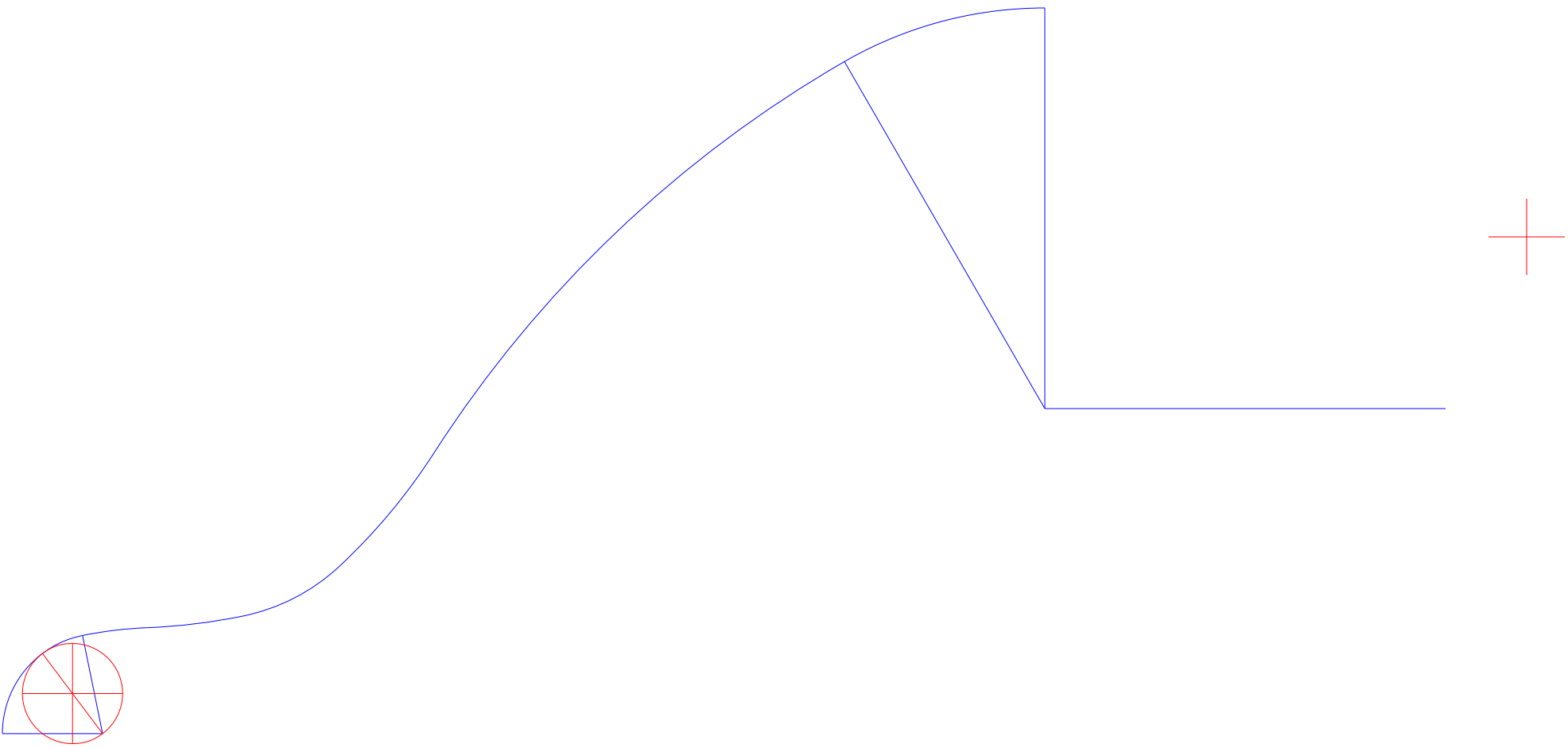
ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 0.65625
Center = (-9.52489, -2.99234)
Angle = 126.8698°

- Radius
- 1/8 B

0.328125
- 3/16 B
- 1/4 B

0.65625
- 3/8 B
- 1/2 B
- 1.3125
- 3/4 B
- Base
- 2.625
- 1.5 B
- 3.9375
- 2 B
- 3 B
- 7.875
- 4 B



$n / p = 0.5 \text{ /} 2$
 $p / n = 2 \text{ *} 2$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 10.5
Center = (-4.63349, -3.53921)
Angle = 173.6206°

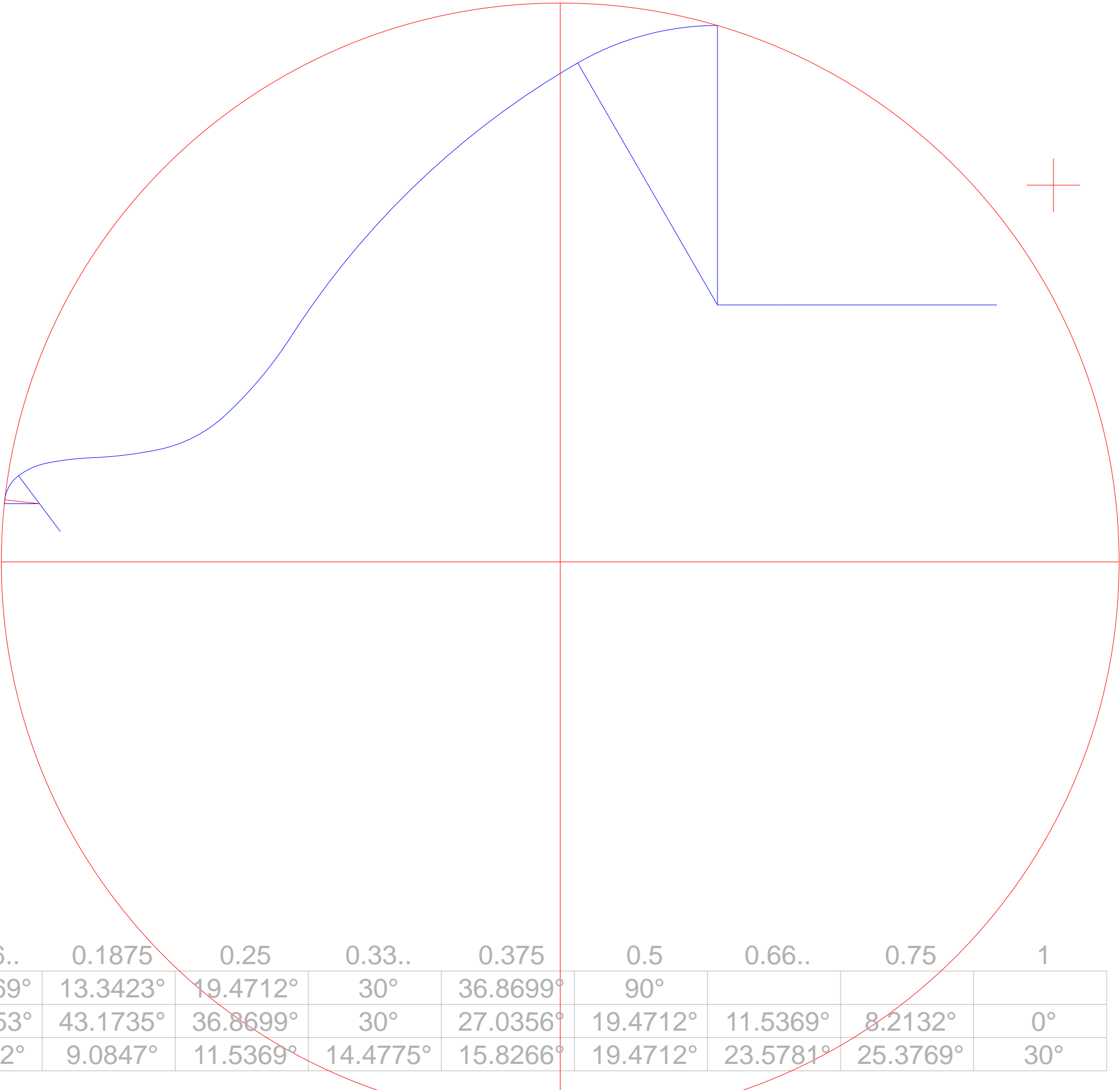
- Radius
- 1/8 B

0.328125
- 3/16 B
- 1/4 B

0.65625
- 3/8 B
- 1/2 B

1.3125
- 3/4 B
- Base 2.625
- 1.5 B 3.9375
- 2 B

5.25
- 3 B 7.875
- 4 B

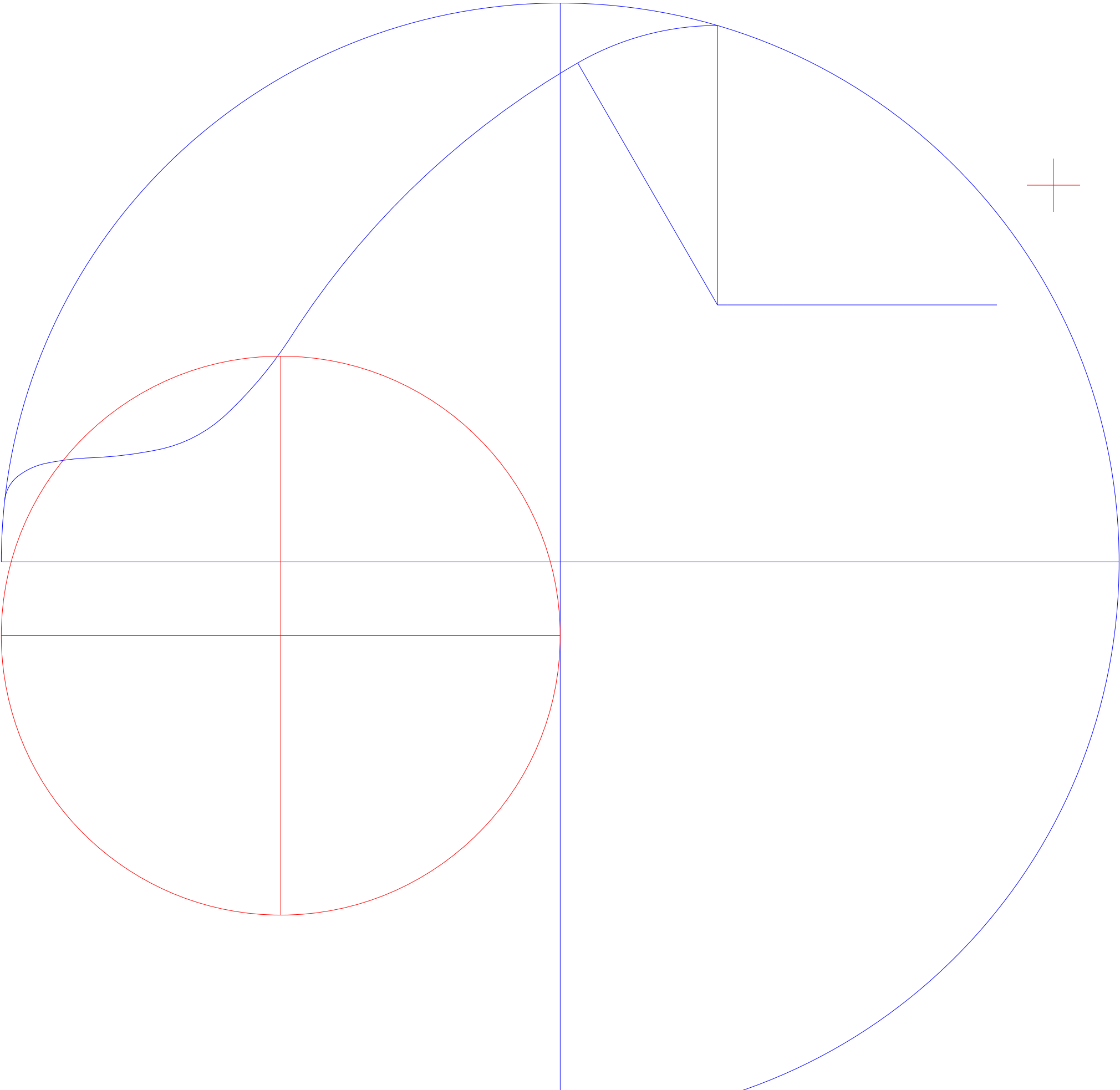


n / p = 16
p / n = 0.625 *2

ratio	0.03125	0.0416..	0.046875	0.0625	0.083..	0.09375	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1
inside	1.8485°	2.4919°	2.8189°	3.8225°	5.2159°	5.9377°	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°			
edge	20.0499°	23.0739°	24.4327°	28.0724°	32.2042°	34.0477°	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°
quad	1.7365°	2.2924°	2.5663°	3.3722°	4.4117°	4.9171°	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°

Diameter = 5.25
Center = (-7.25849, -4.23168)

Radius		
1/8 B	0.328125	
3/16 B		
1/4 B	0.65625	
3/8 B		
1/2 B	1.3125	
3/4 B		
Base	2.625	
1.5 B	3.9375	
2 B	5.25	
3 B	7.875	
4 B		



Diameter = 1.3125
Center = (-9.21505, -4.45043)
Angle = 186.3793°

top string ends with 5.25 R - 0.65625 D @ 6.37°
this begins / ends with 5.25 D - 0.65625 R @ 6.37°

- Radius
- 1/8 B

0.328125
- 3/16 B
- 1/4 B

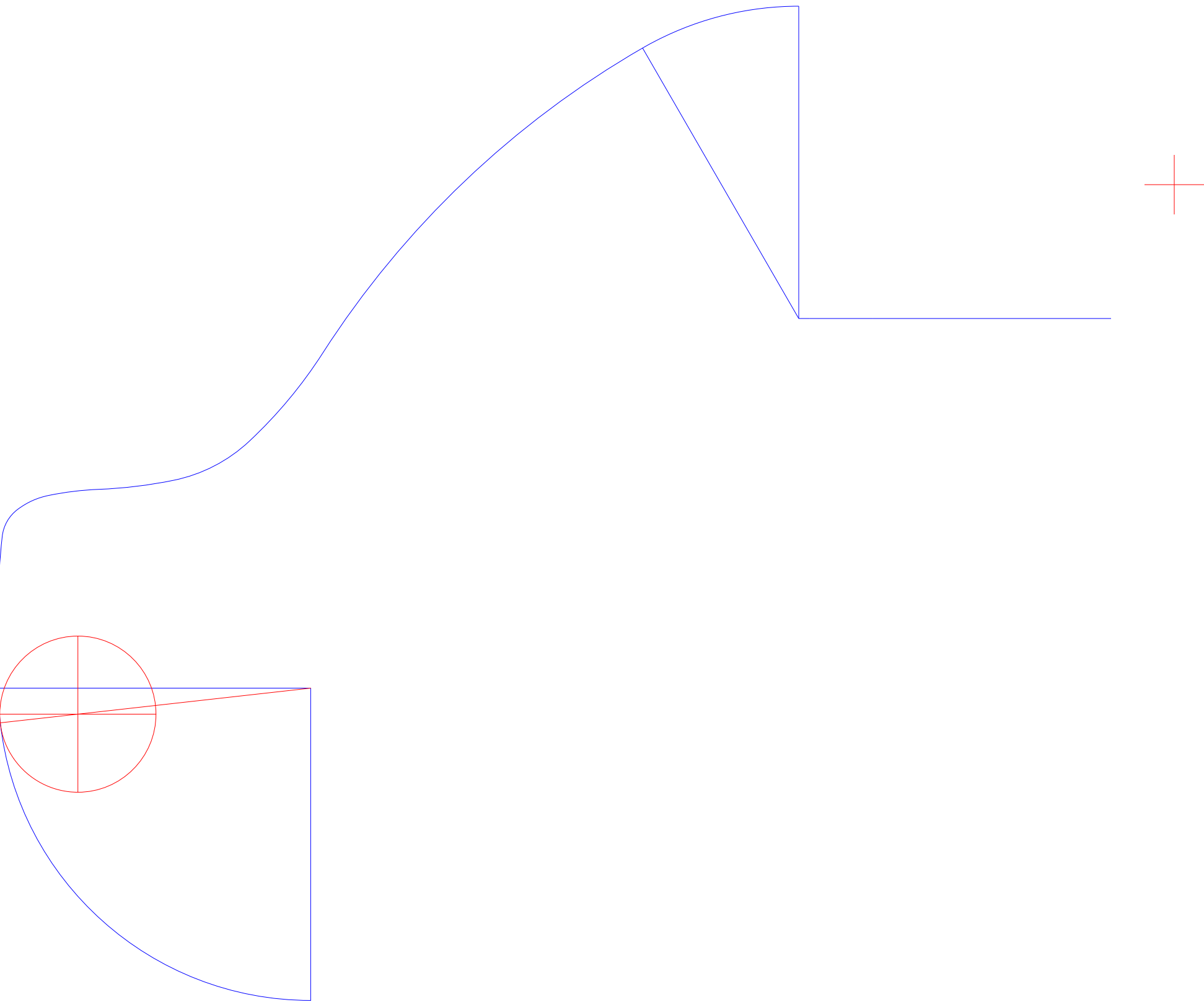
0.65625
- 3/8 B
- 1/2 B

1.3125
- 3/4 B
- Base

2.625
- 1.5 B
- 3.9375
- 2 B
- 5.25
- 3 B
- 7.875
- 4 B

$n / p = 0.25 \text{ / } 2$
 $p / n = 4$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°		8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 0.984375
Center = (-9.34969, -4.54418)
Angle = 214.8499°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B
- 1/2 B

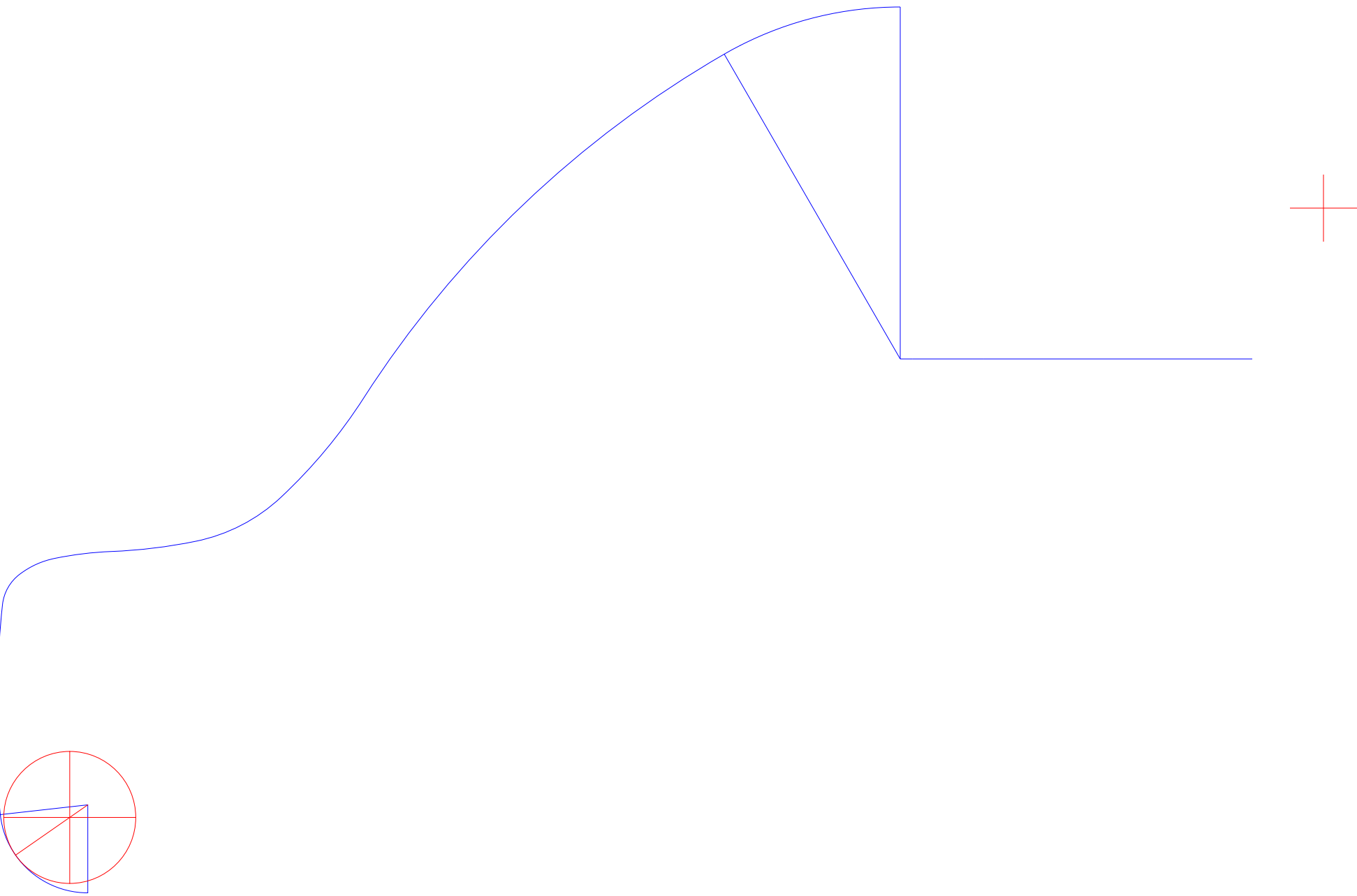
1.3125
- 3/4 B
- Base

2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B



$n / p = 1.33\ldots$
 $p / n = 0.75$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 1.96875
Center = (-9.18563, -4.08014)
Angle = 250.2501°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

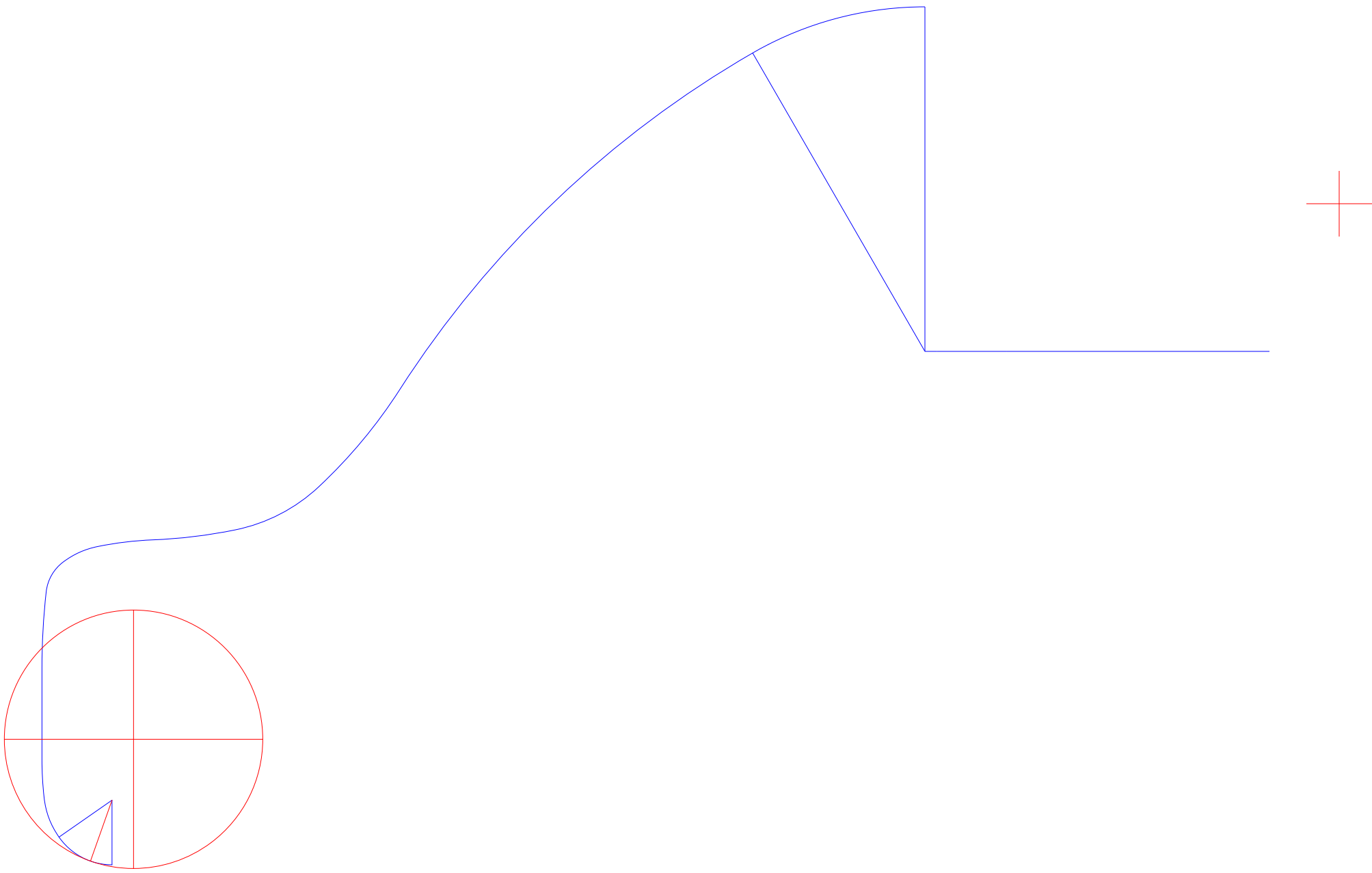
1.3125
- 3/4 B
- Base

2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B



$n / p = 6$
 $p / n = 0.166\ldots / 2$

ratio	0.03125	0.0416..	0.046875	0.0625	0.083..	0.09375	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1
inside	1.8485°	2.4919°	2.8189°	3.8225°	5.2159°	5.9377°	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°			
edge	20.0499°	23.0739°	24.4327°	28.0724°	32.2042°	34.0477°	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°
quad	1.7365°	2.2924°	2.5663°	3.3722°	4.4117°	4.9171°	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°

Diameter = 15.75
Center = (-13.32, 1.43236)
Angle = 306.8698°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B
- Base

2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

n

/

p

=

8

/

2

p

/

n

=

0.125

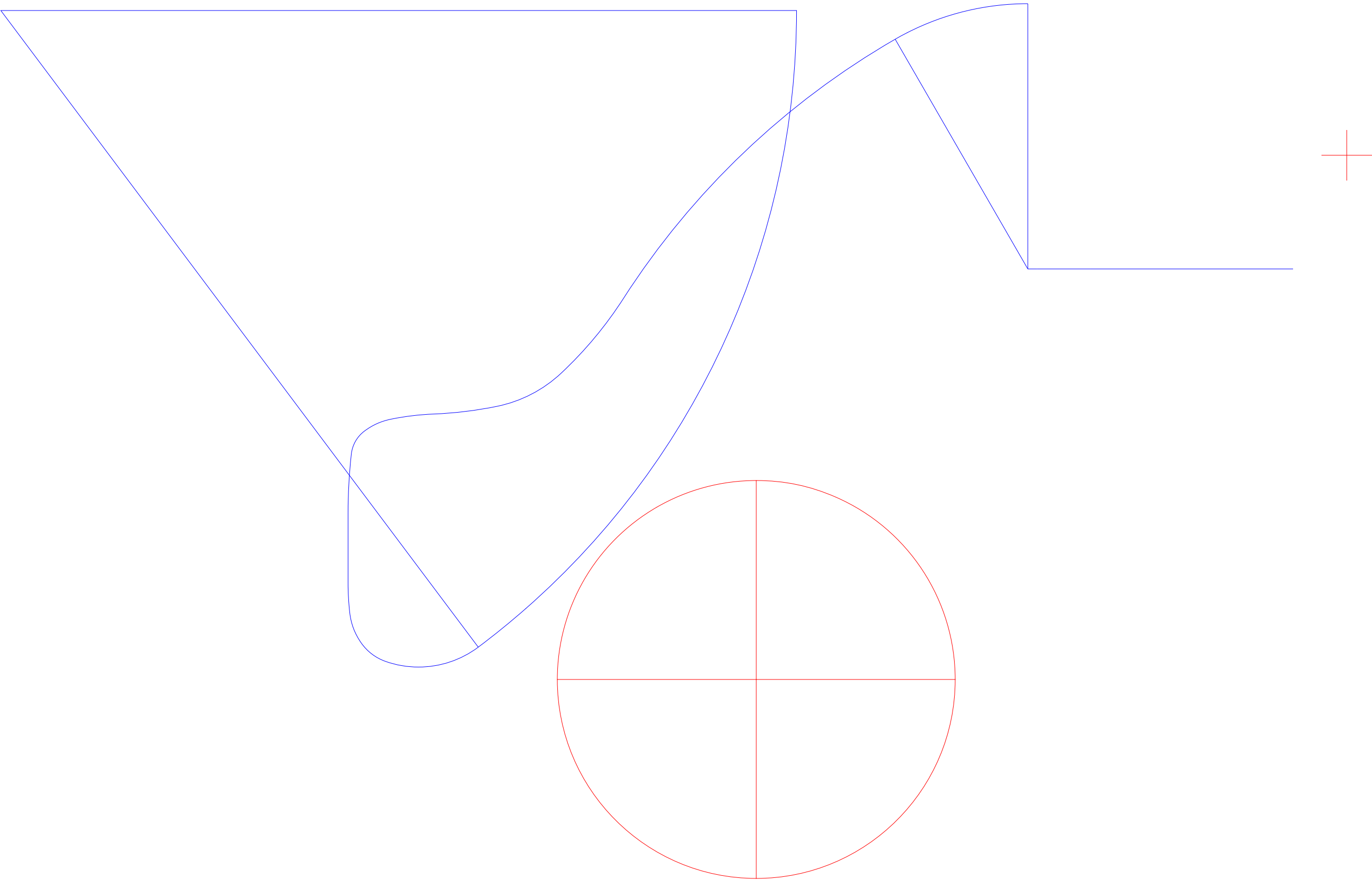
*

2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 3.9375
Center = (-5.84375, -5.1875)

Radius		
1/8 B	0.328125	
3/16 B	0.4921875	
1/4 B	0.65625	
3/8 B	0.984375	
1/2 B	1.3125	
3/4 B	1.96875	
Base	2.625	
1.5 B	3.9375	
2 B	5.25	
3 B	7.875	
4 B		



Diameter = 10.5
Center = (-4.20313, -8.02915)
Angle = 120°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

n

/

p

= 2.66..

/8

p

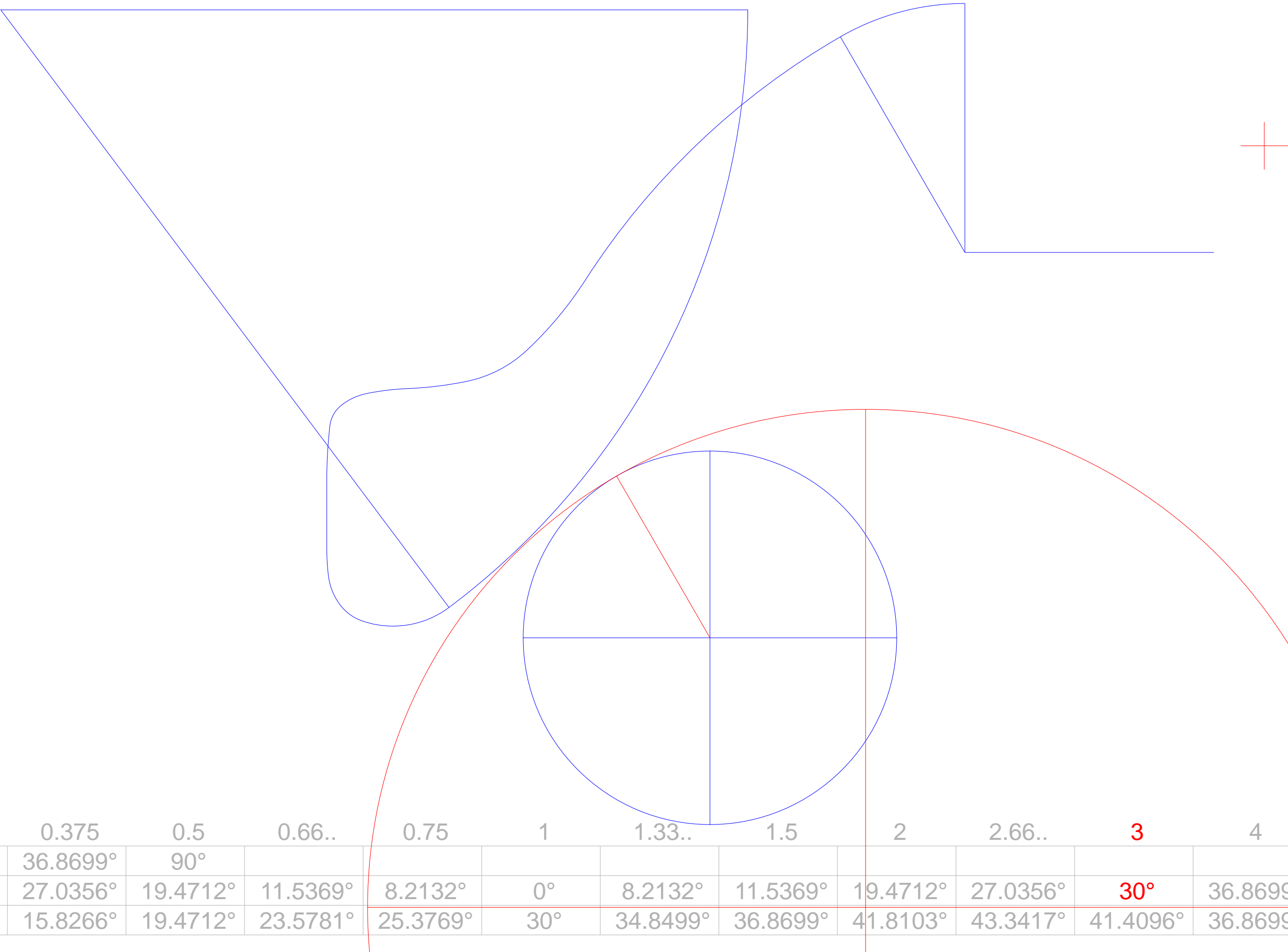
/

n

= 0.375

*8

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 21
Center = (-9.25625, -13.0065)
Angle = 66.4218°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

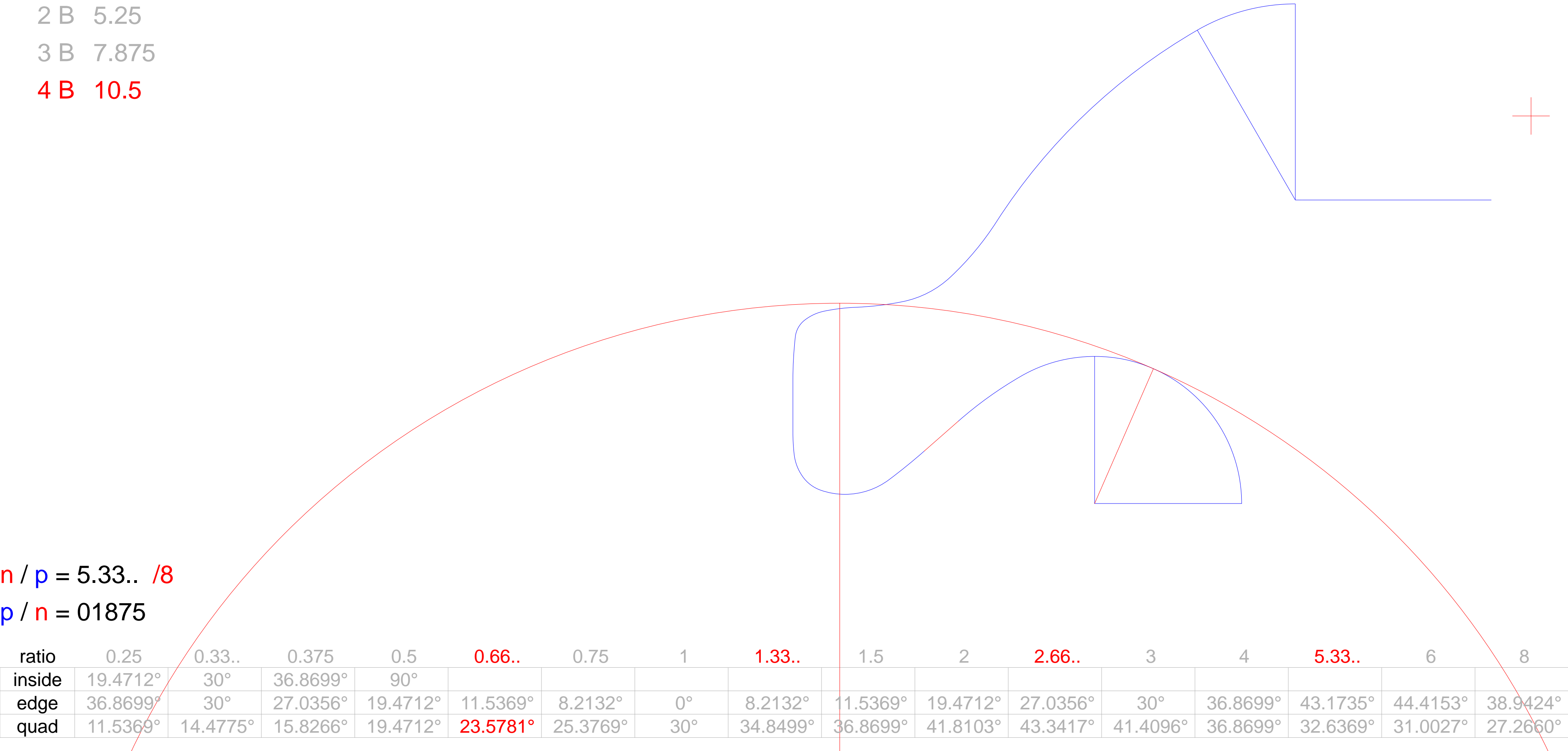
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

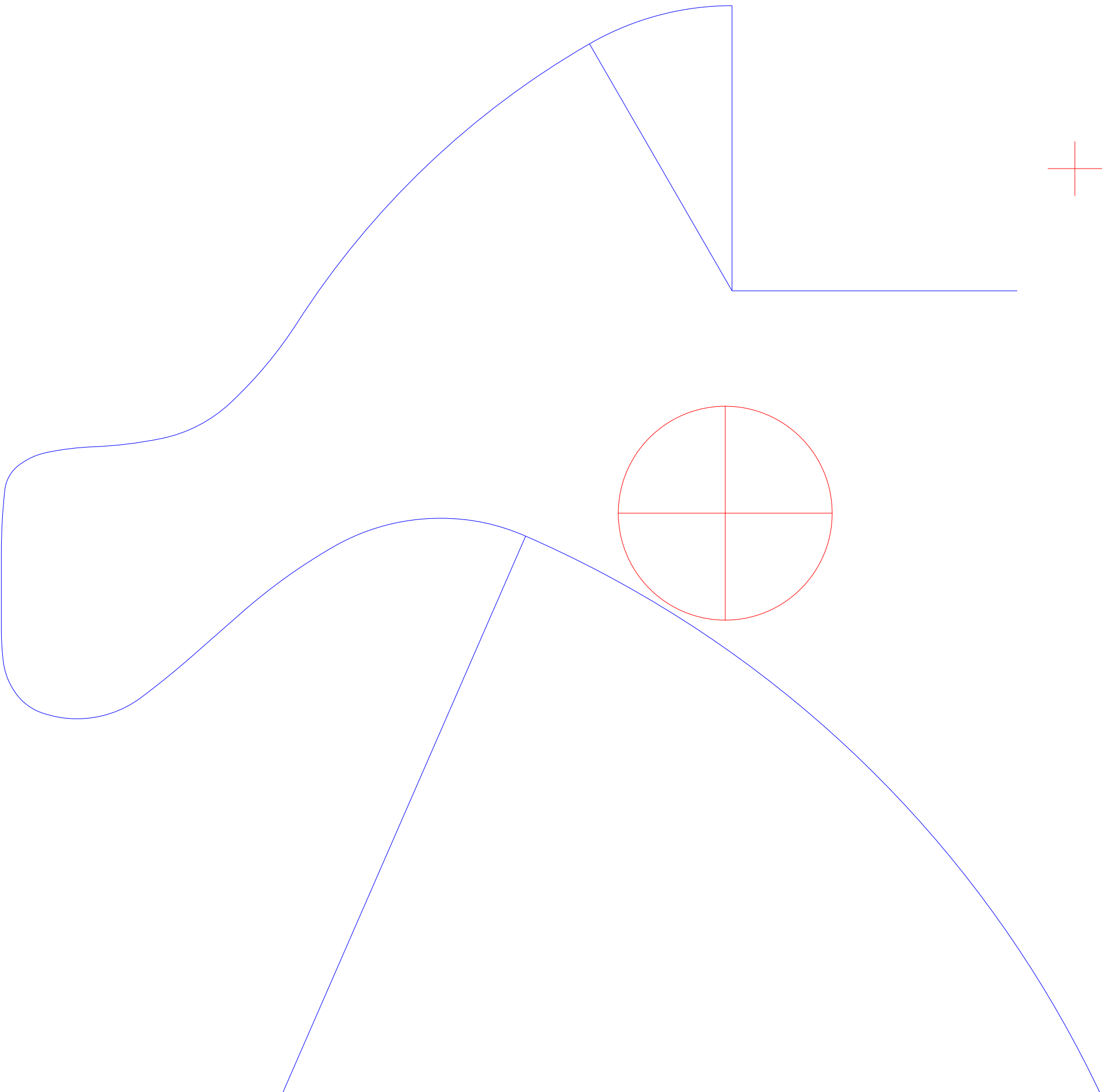
7.875
- 4 B

10.5



Diameter = 1.96875
Center = (-3.21875, -3.171875)

Radius		
1/8 B	0.328125	
3/16 B	0.4921875	
1/4 B	0.65625	
3/8 B	0.984375	
1/2 B	1.3125	
3/4 B	1.96875	
Base	2.625	
1.5 B	3.9375	
2 B	5.25	
3 B	7.875	
4 B	10.5	



Diameter = 7.875
Center = (-2.23438, -0.387642)
Angle = 250.2501°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5

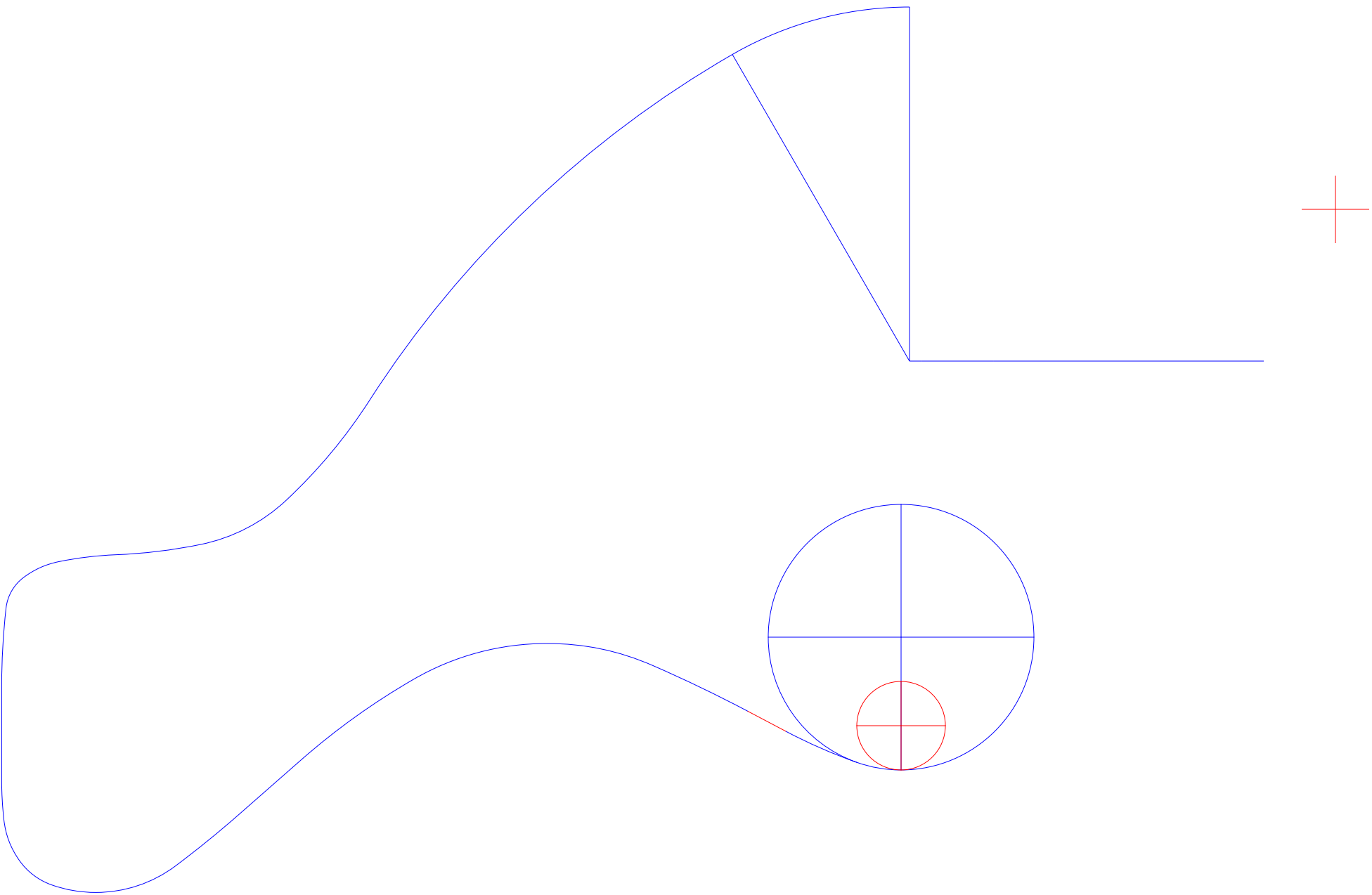
n / p = 4

p / n = 0.25

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 0.65625
Center = (-3.21875, -3.828125)

Radius		
1/8 B	0.328125	
3/16 B	0.4921875	
1/4 B	0.65625	
3/8 B	0.984375	
1/2 B	1.3125	
3/4 B	1.96875	
Base	2.625	
1.5 B	3.9375	
2 B	5.25	
3 B	7.875	
4 B	10.5	



Diameter = 5.25
Center = (-0.661269, -2.35156)
Angle = 30°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

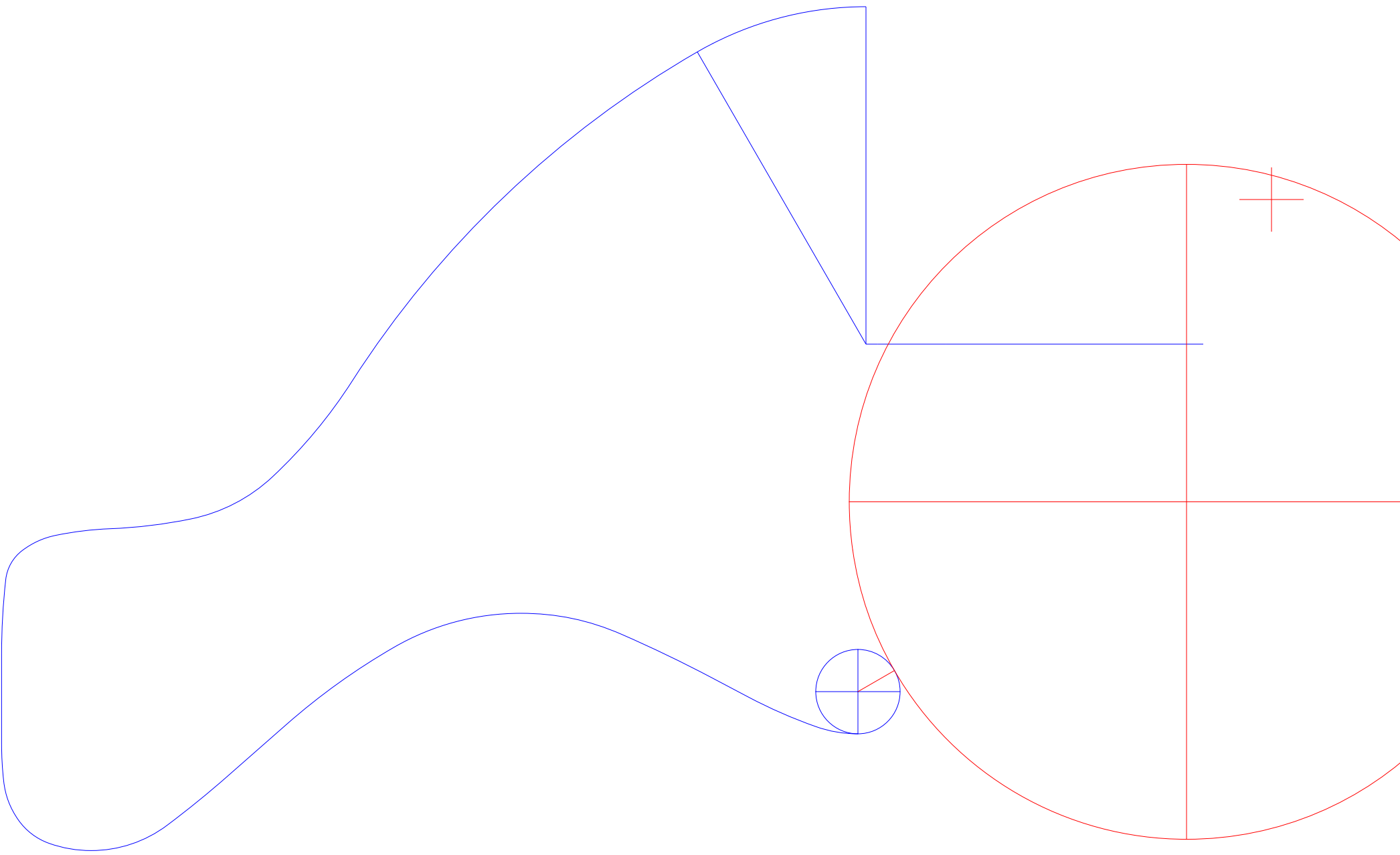
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5



$n / p = 8 / 8$
 $p / n = 0.125 \times 8$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 2.625
Center = (-1.96031, -2.53906)
Angle = 188.2132°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

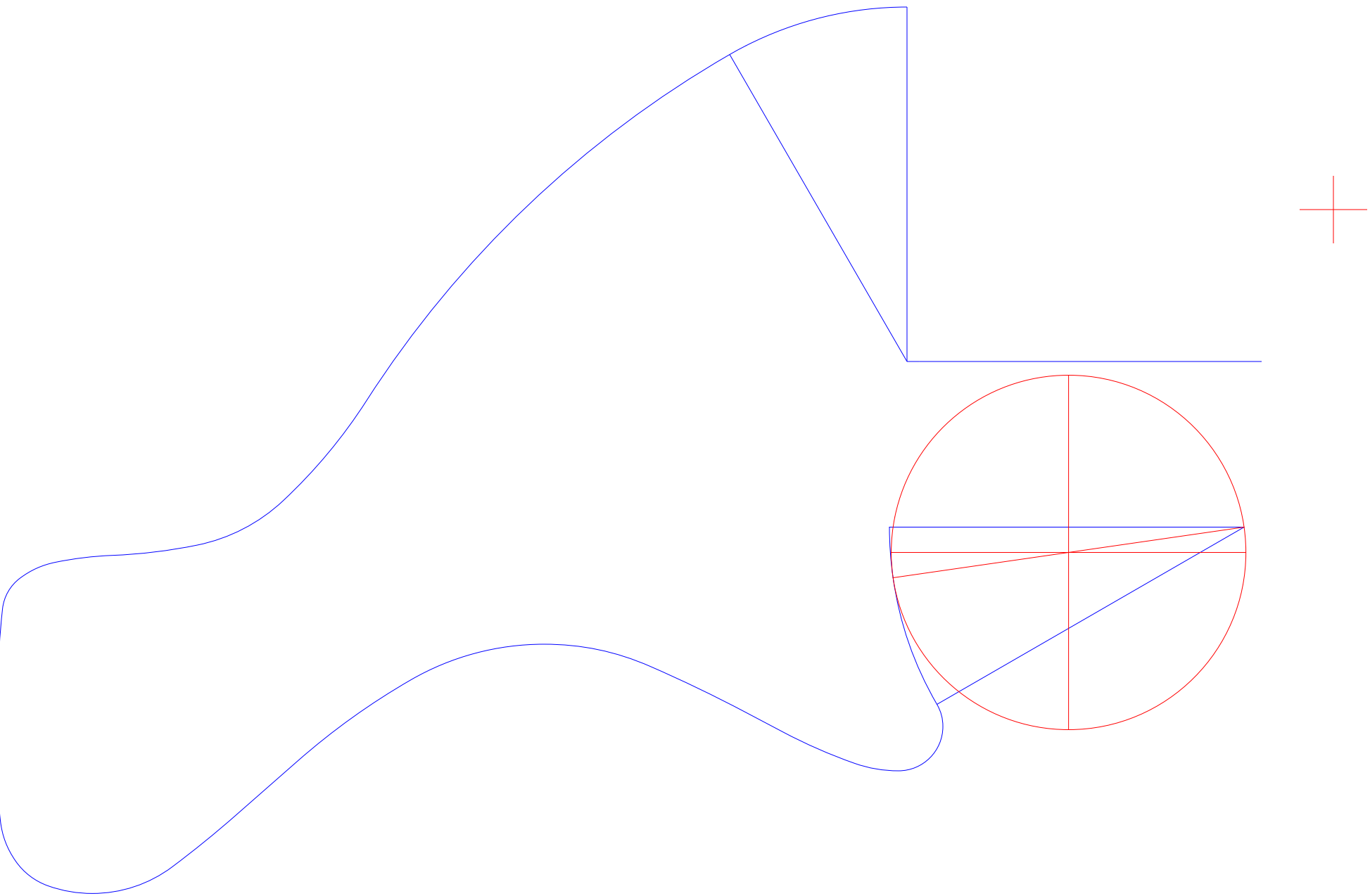
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5



$n / p = 0.5 \text{ / } 4$
 $p / n = 2$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 3.9375
Center = (-1.31732, -2.67031)
Angle = 168.463°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

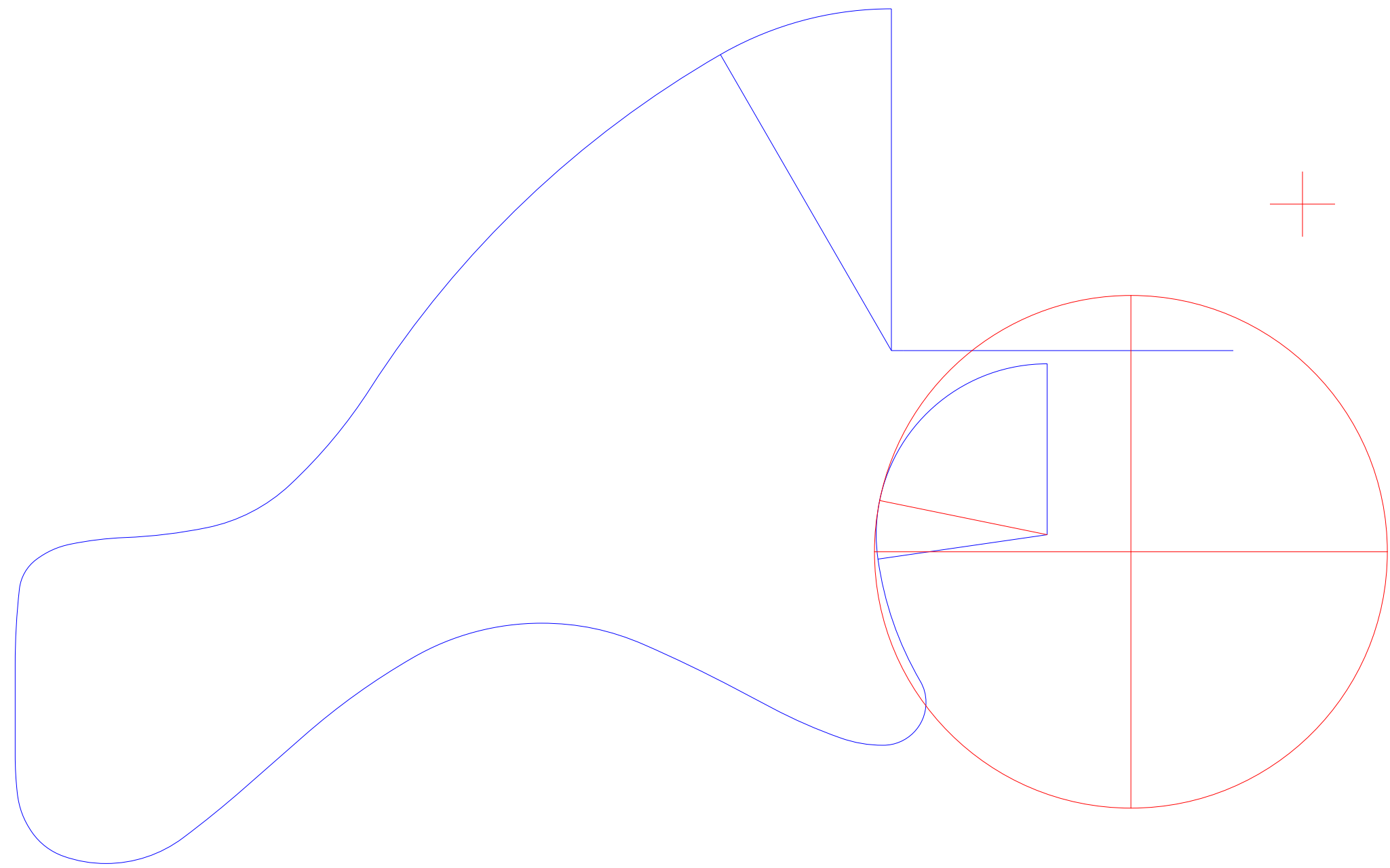
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5



$n / p = 1.5$
 $p / n = 0.66\ldots$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 3.9375
Center = (-3.45455, -0.540463)
Angle = 117.0356°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

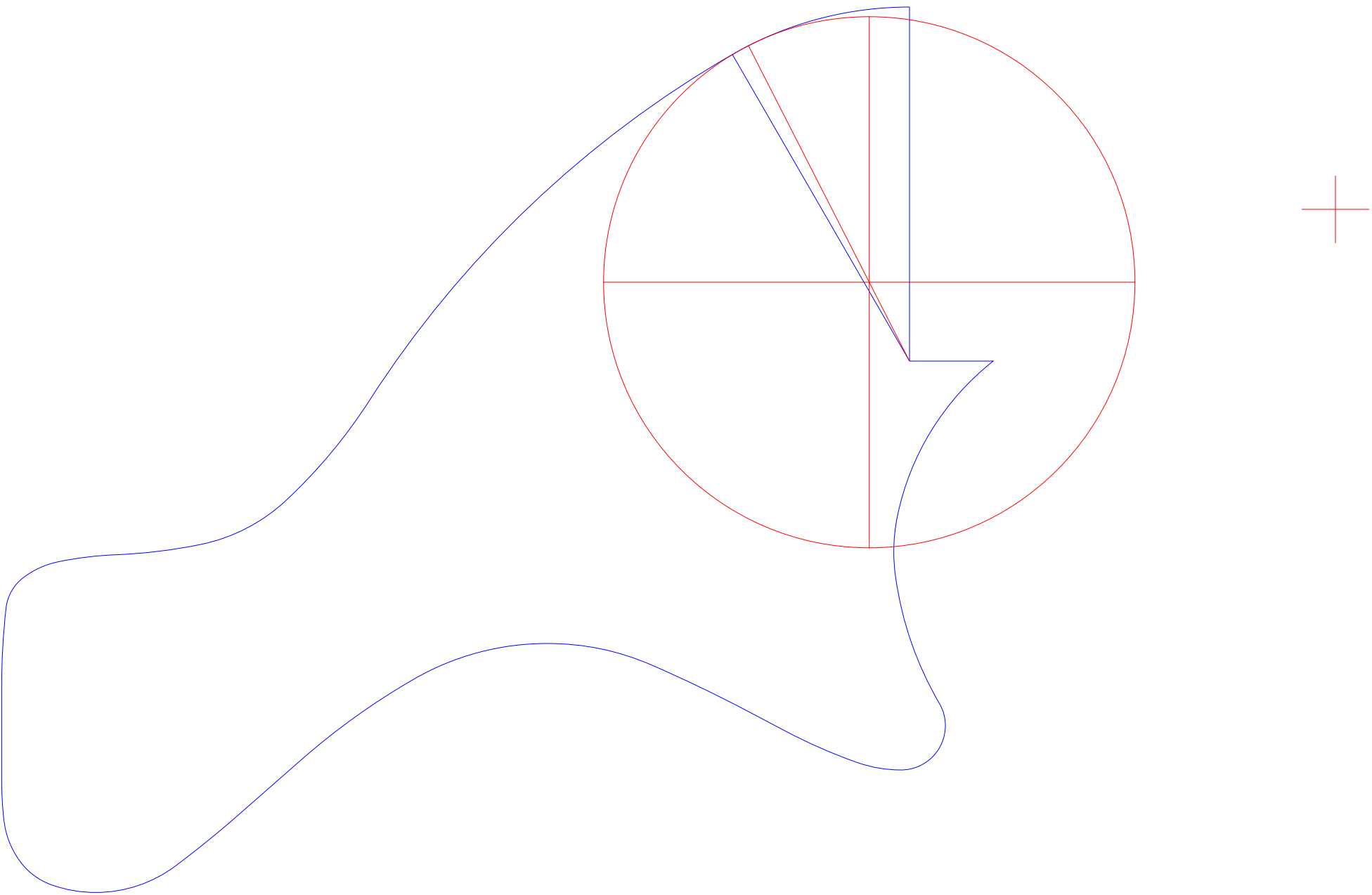
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5



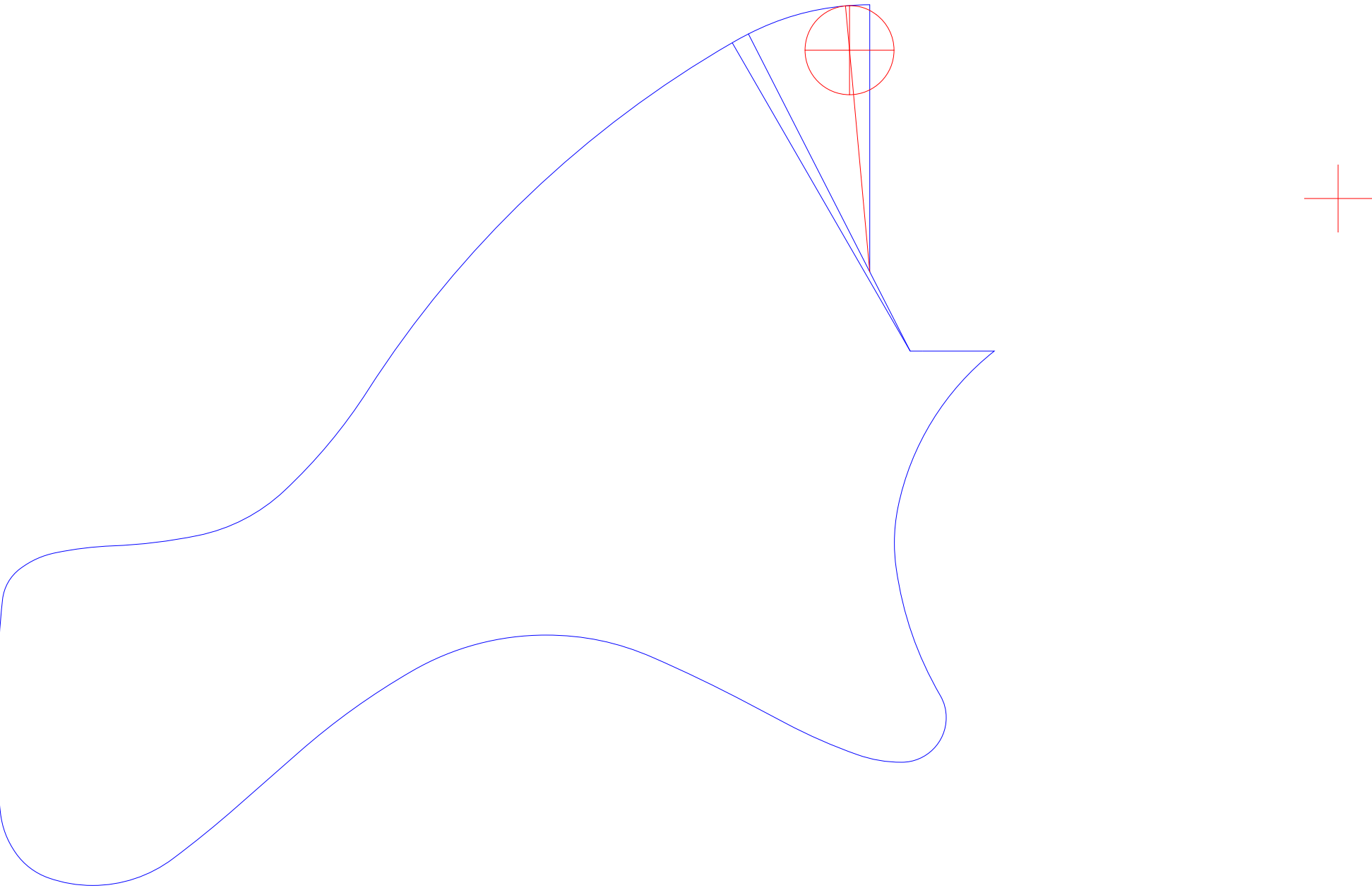
n / p = 0.75 /2
p / n = 1.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 0.65625
Center = (-3.60369, 1.09337)
Angle = 95.2159°

this, as the 1st in an upcoming string of 3,
mimics a 0.75 diameter...
a similar sequence is seen on the body.

- Radius
- 1/8 B 0.328125
 - 3/16 B 0.4921875
 - 1/4 B 0.65625
 - 3/8 B 0.984375
 - 1/2 B 1.3125
 - 3/4 B 1.96875
 - Base 2.625
 - 1.5 B 3.9375
 - 2 B 5.25
 - 3 B 7.875
 - 4 B 10.5



$n / p = 0.166\ldots / 2$
 $p / n = 6$

ratio	0.03125	0.0416..	0.046875	0.0625	0.083..	0.09375	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1
inside	1.8485°	2.4919°	2.8189°	3.8225°	5.2159°	5.9377°	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°			
edge	20.0499°	23.0739°	24.4327°	28.0724°	32.2042°	34.0477°	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°
quad	1.7365°	2.2924°	2.5663°	3.3722°	4.4117°	4.9171°	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°

Diameter = 0.984375
Center = (-3.70213, 0.962119)
Angle = 53.1301°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

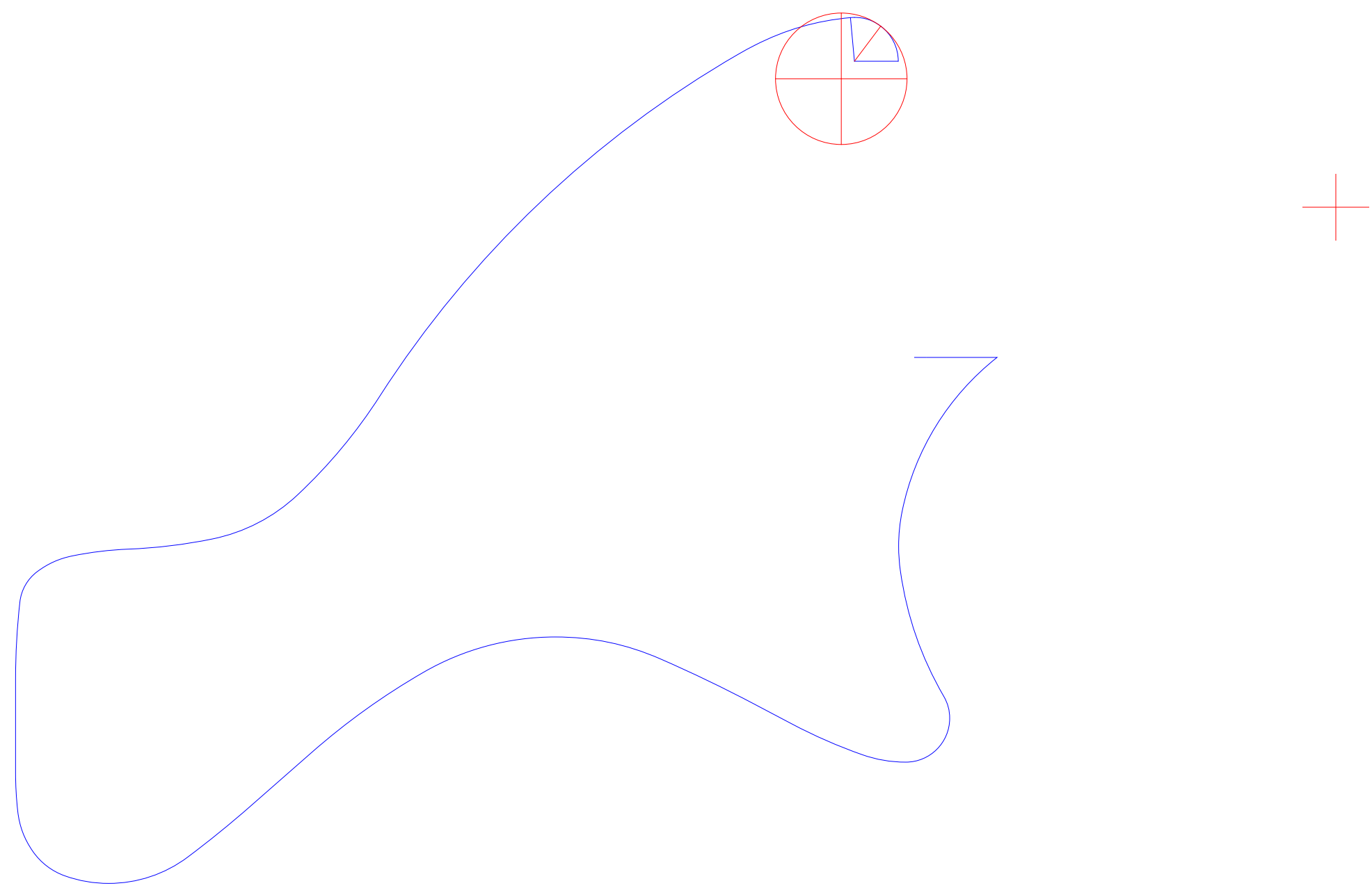
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5



$n / p = 1.5$
 $p / n = 0.66\ldots$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 0.65625
Center = (-3.57908, 1.07064)
Angle = 41.4096°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

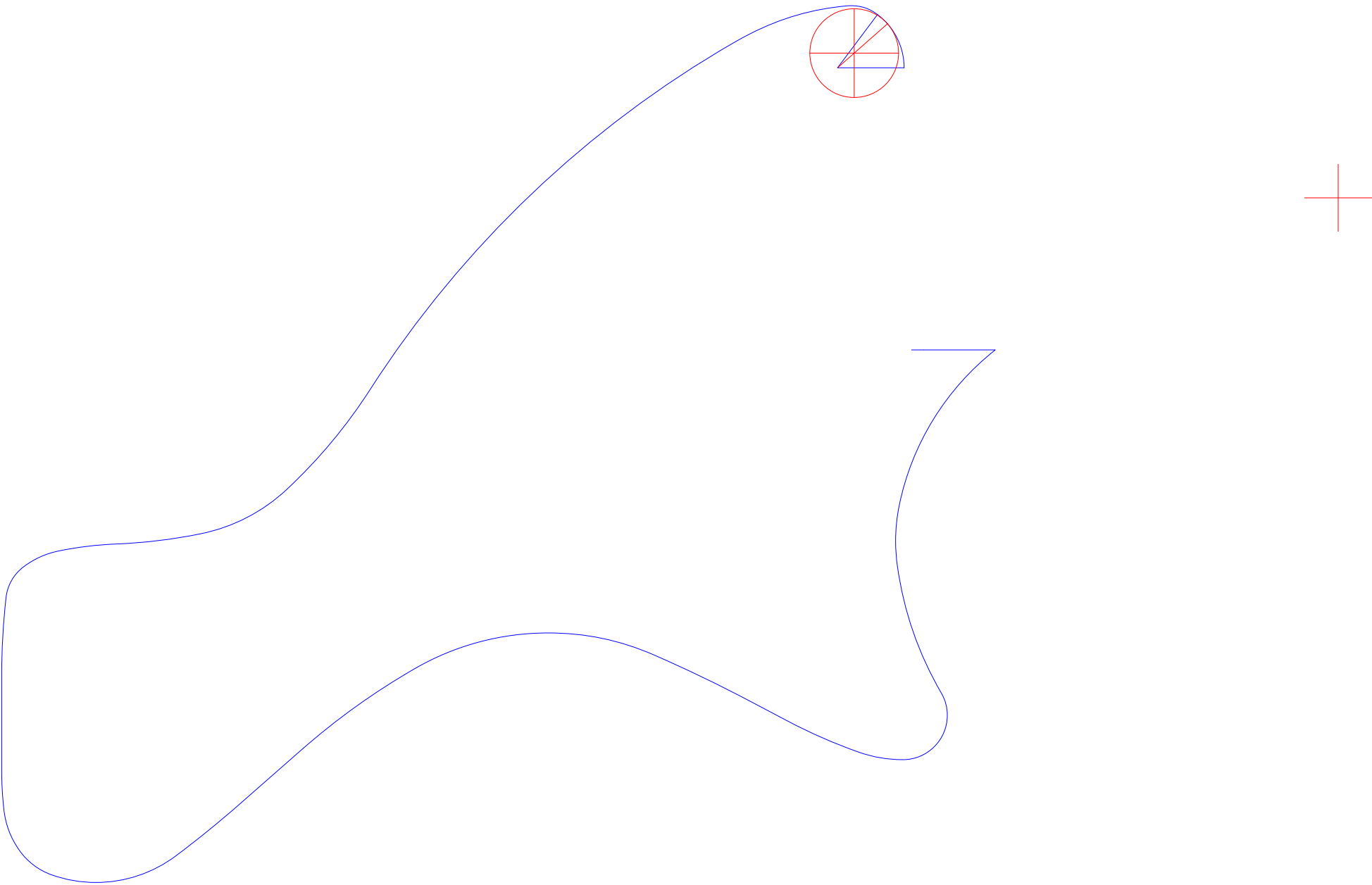
2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5

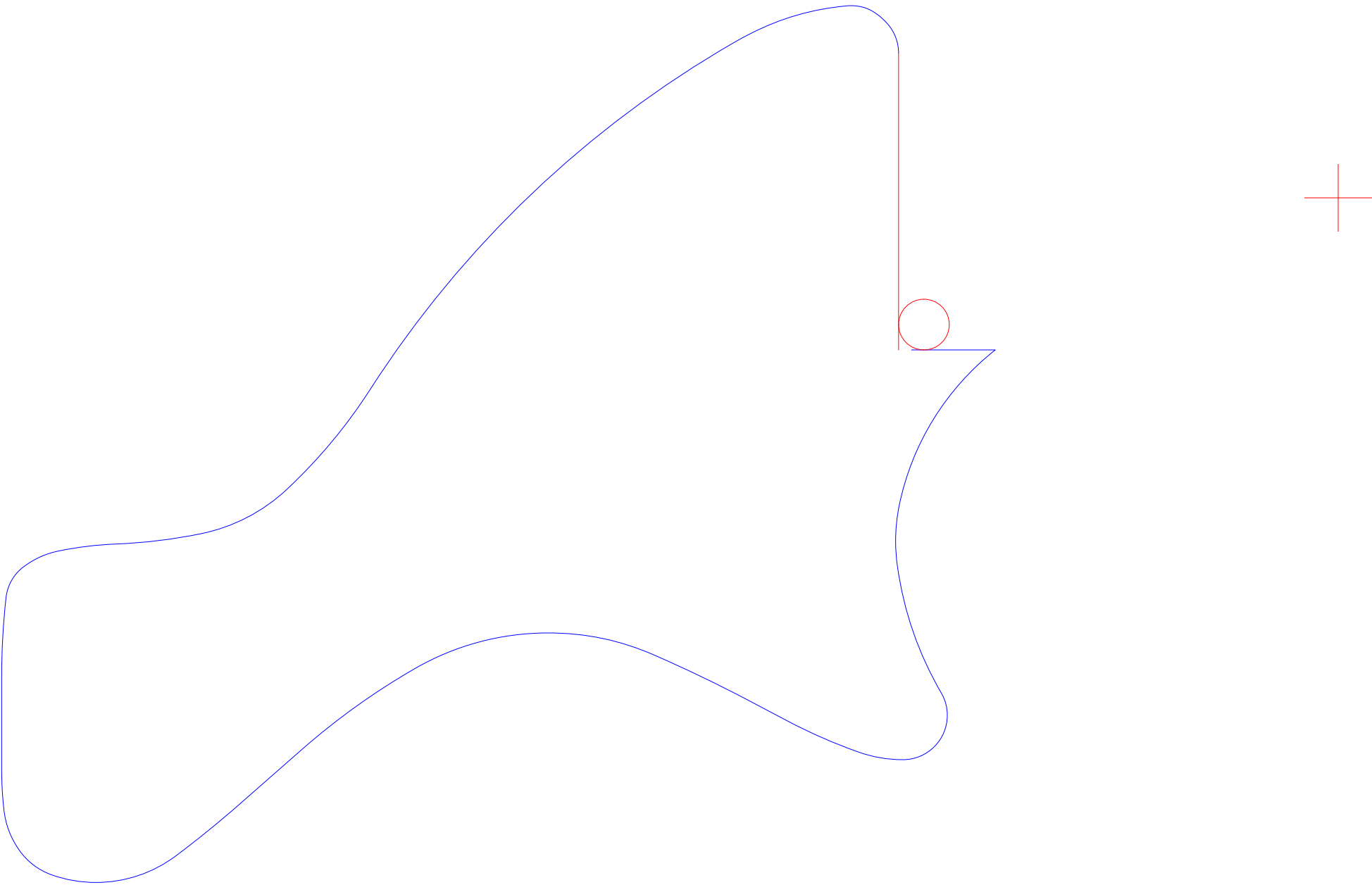


n / p = 0.66..
p / n = 1.5 x 2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

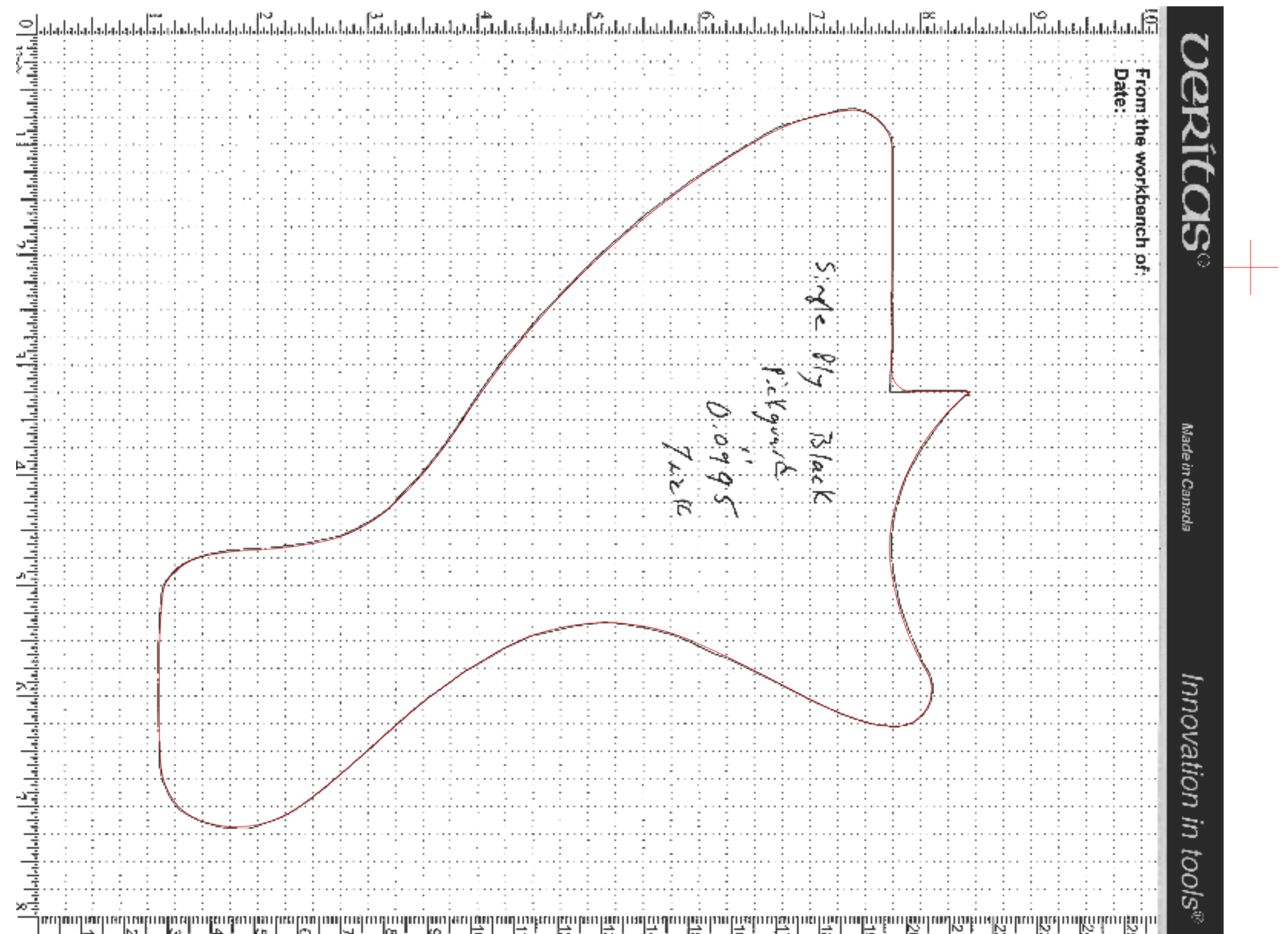
router remains - assuming a 3/8 D bit
corner was hand cut / filed / sanded to fit angle

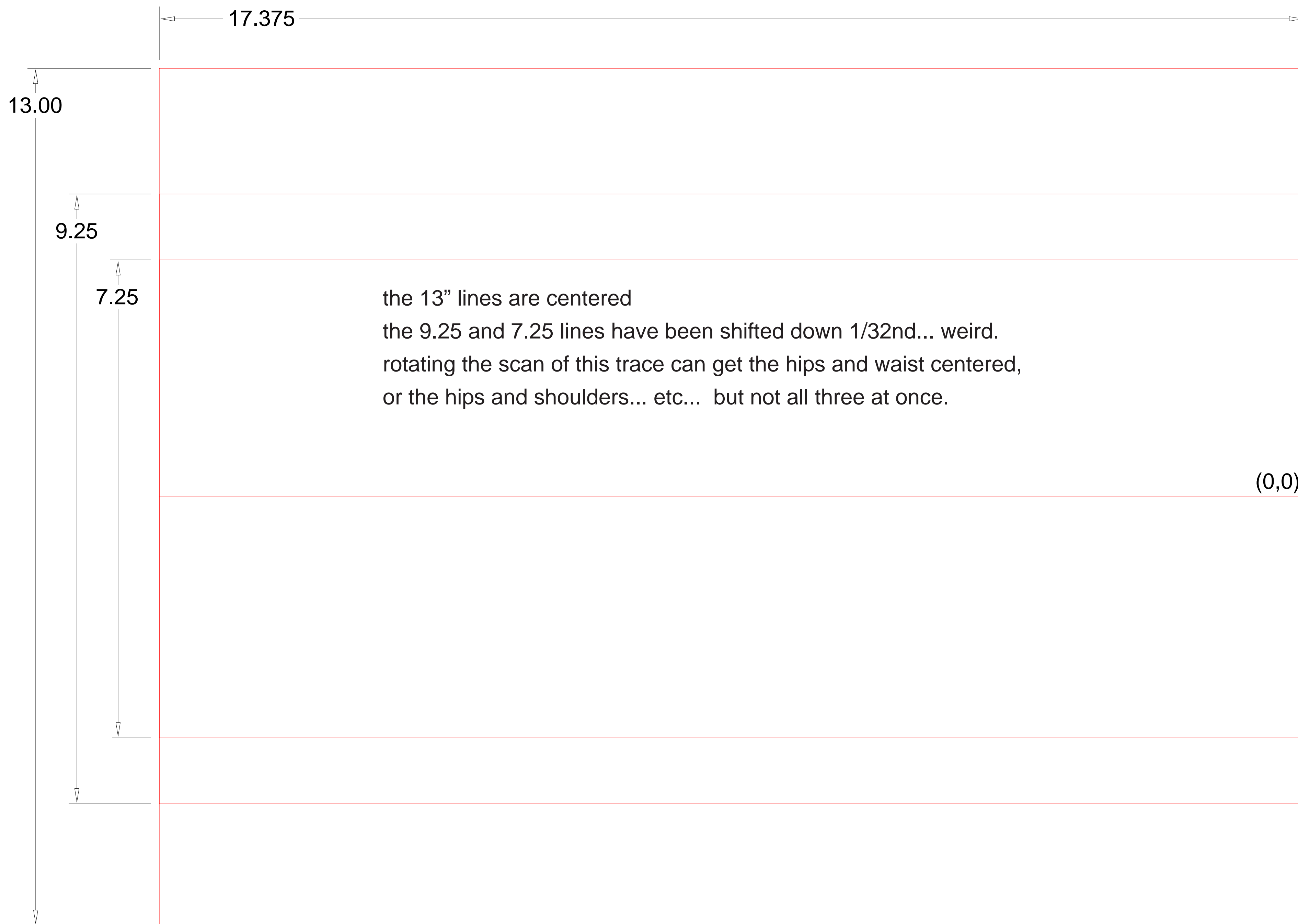
	Radius
1/8 B	0.328125
3/16 B	0.4921875
1/4 B	0.65625
3/8 B	0.984375
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	10.5



over unmolested scan
scan low res @ 72 dpi - each pixel = 0.013888" square
tapered corner shows signs of being worked by hand

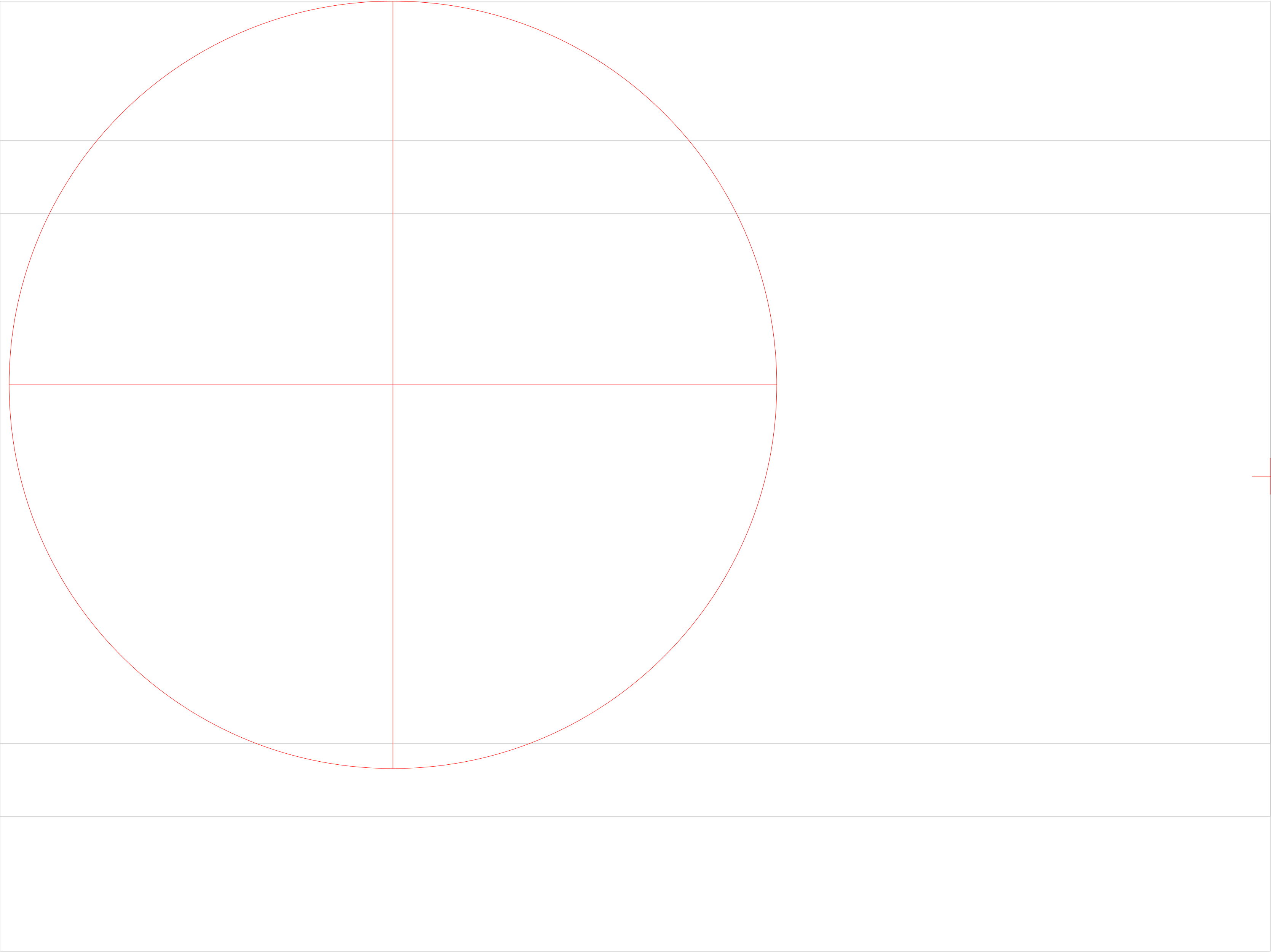
unfortunately, the screw holes weren't marked on the tracing





Diameter = 10.5
Center = (-12, 1.25)

Radius	
1/8 B	0.328125
3/16 B	0.4921875
1/4 B	0.65625
3/8 B	0.984375
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875



Diameter = 10.5

Center = (-11.9455, -1.25)

set-up for just one arc

	Radius
1/8 B	0.328125
3/16 B	0.4921875
1/4 B	0.65625
3/8 B	0.984375
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	10.5

green vertical 1st
green circle 2nd
green horizontal 3rd
red from intersection

5.25 R

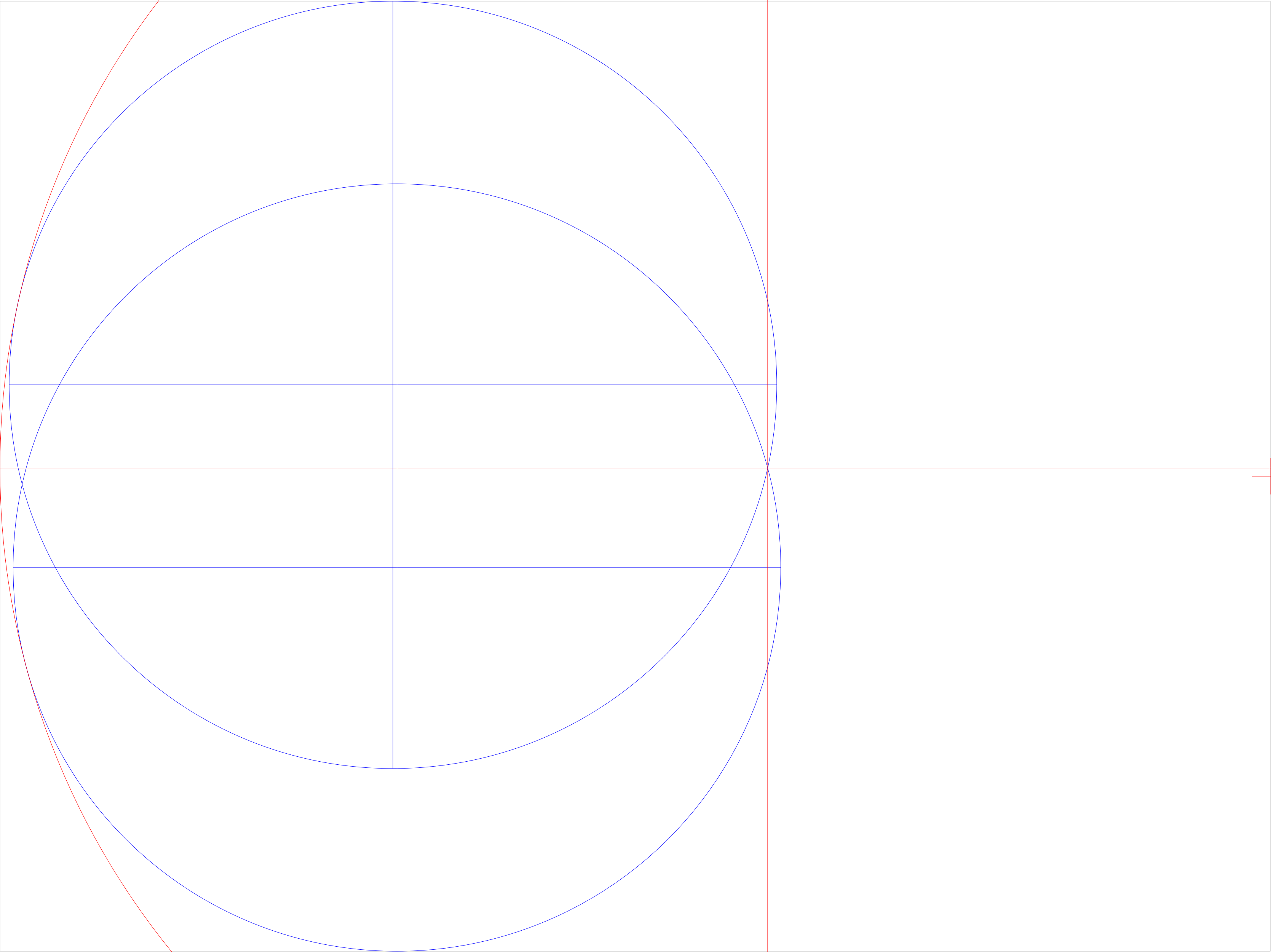
10.50 R

12.00

Diameter = 21.5
Center = (-6.875, 0.111196)

arc from intersection
tangent to both and the dimension box

Radius	
1/8 B	0.328125
3/16 B	0.4921875
1/4 B	0.65625
3/8 B	0.984375
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	10.5

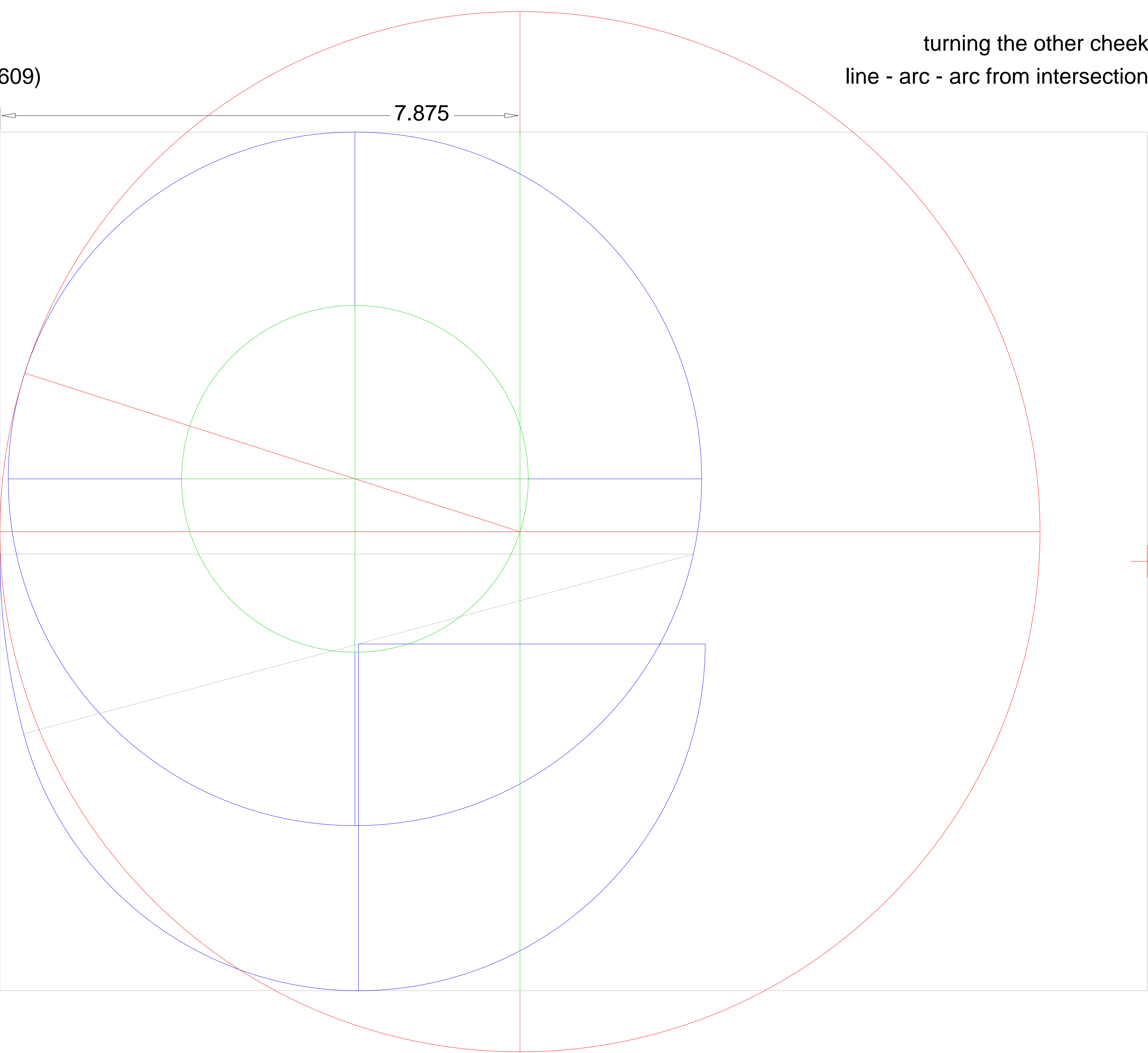


the punchline: it's only used on the bottom

Diameter = 15.75
Center = (-9.5, 0.449609)

turning the other cheek
line - arc - arc from intersection

	Radius
1/8 B	0.328125
3/16 B	0.4921875
1/4 B	0.65625
3/8 B	0.984375
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	10.5



Diameter = 15.75
Center = (-13.0705, 1.12171)
Angle = 295.3769°

- Radius
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B

0.65625
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B

10.5

n / p = 1.5 /2
p / n = 0.66..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

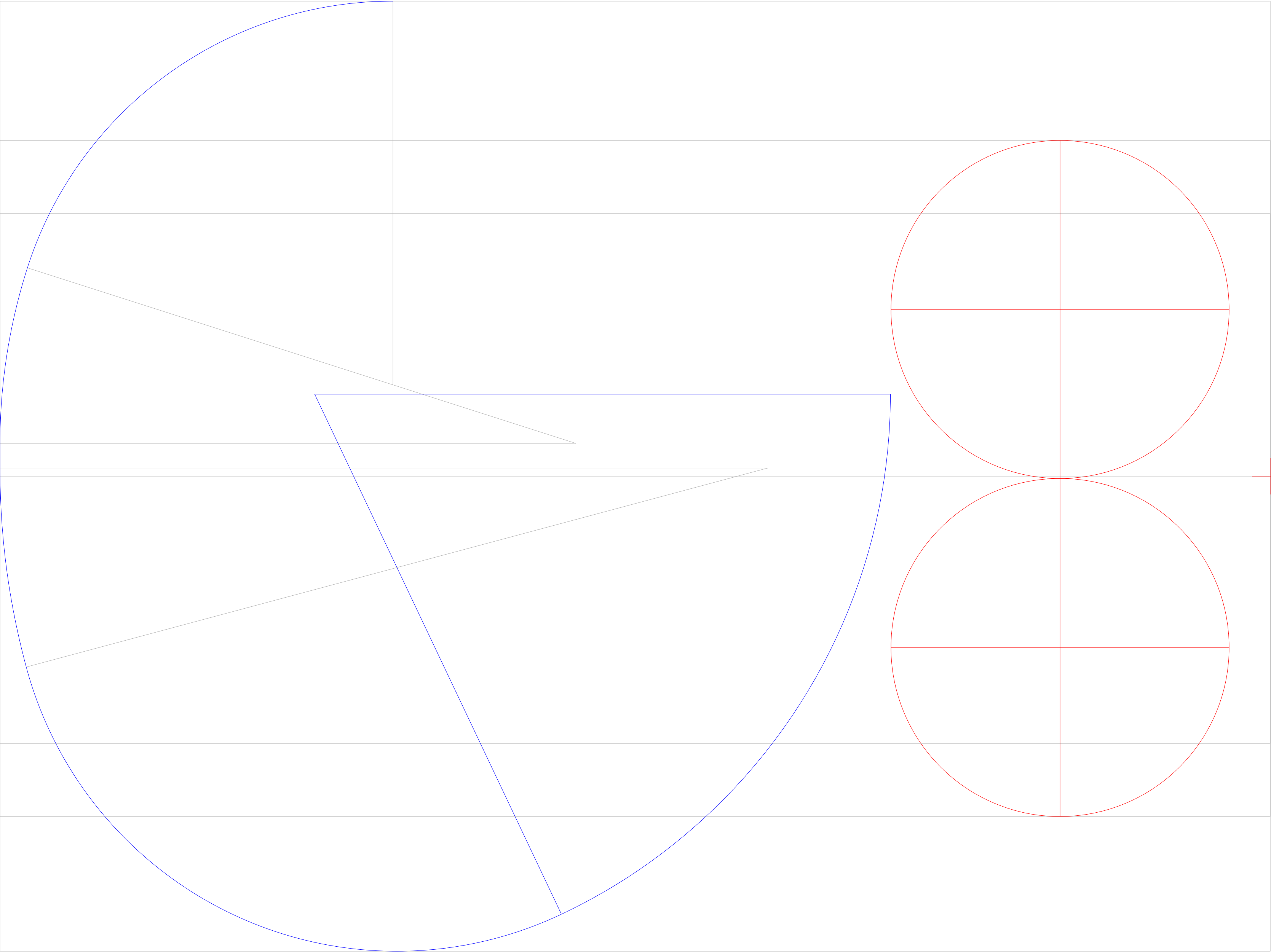
Diameter = 4.625

Center = (-2.875, 2.28125)

Center = (-2.875, -2.34375)

the 2.625 base no longer fits
the radius for half the waist (3.625) was a dead end
the radius for half the shoulder width (4.625) nails it

- Radius
- 1/8 B
 - 3/16 B
 - 1/4 B
 - 3/8 B
 - 1/2 B
 - 3/4 B
 - Base 2.3125
 - 1.5 B
 - 2 B
 - 3 B
 - 4 B



note the shoulder center line shown 1/32 lower

Diameter = 3.46875
Center = (-5.92188, -5.39063)

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

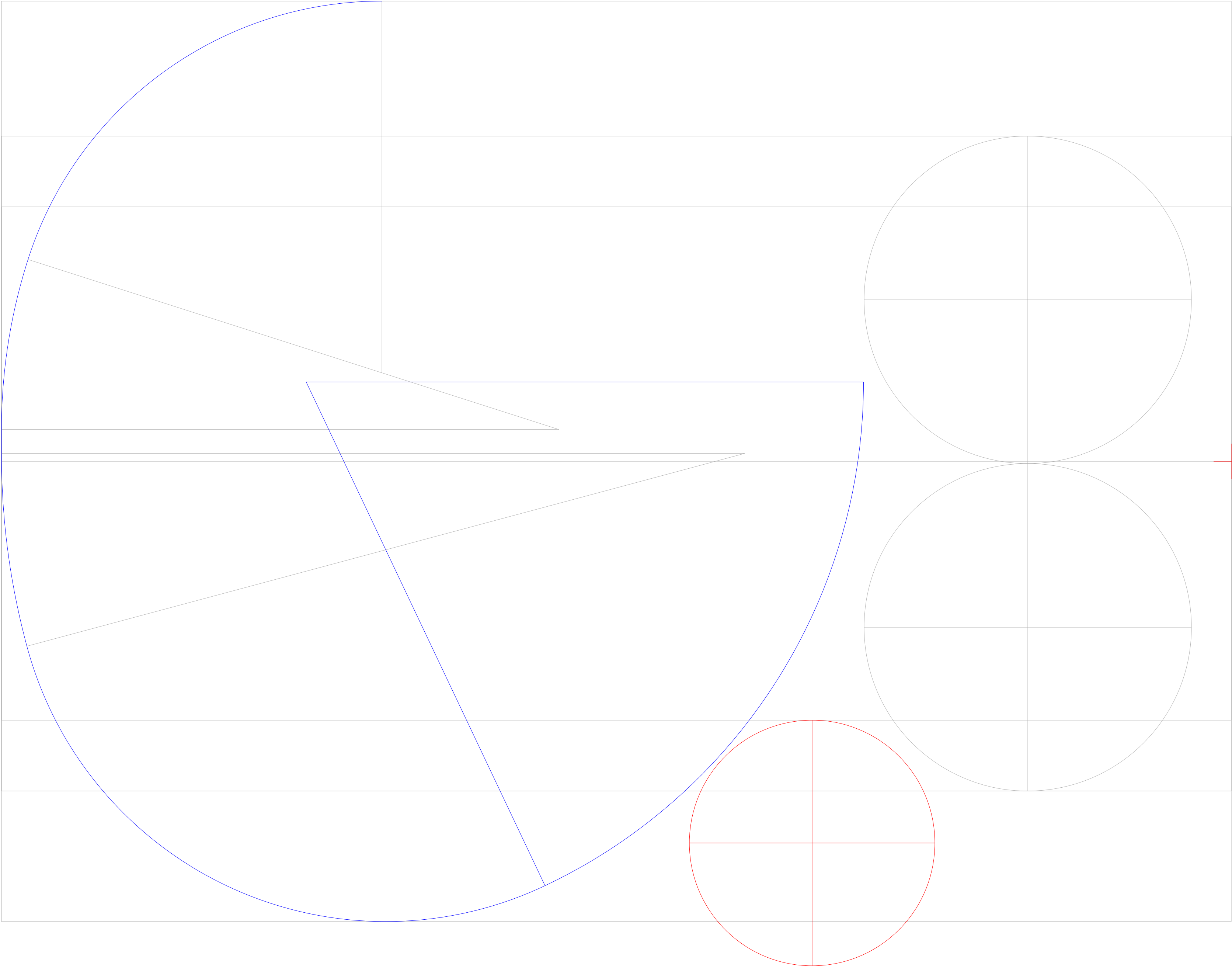
Base

1.5 B

2 B

3 B

4 B
- 2.3125
- 1.734375



Diameter = 13.875
Center = (-2.65151, -9.4375)
Angle = 128.9424°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B 1.734375

Base 2.3125

1.5 B

2 B

3 B 6.9375

4 B

n

/

p

=

4

*

2

p

/

n

=

0.25

/

2

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°

Diameter = 18.5
Center = (-8.96628, -12.262)
Angle = 66.1044°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B 1.734375

Base 2.3125

1.5 B

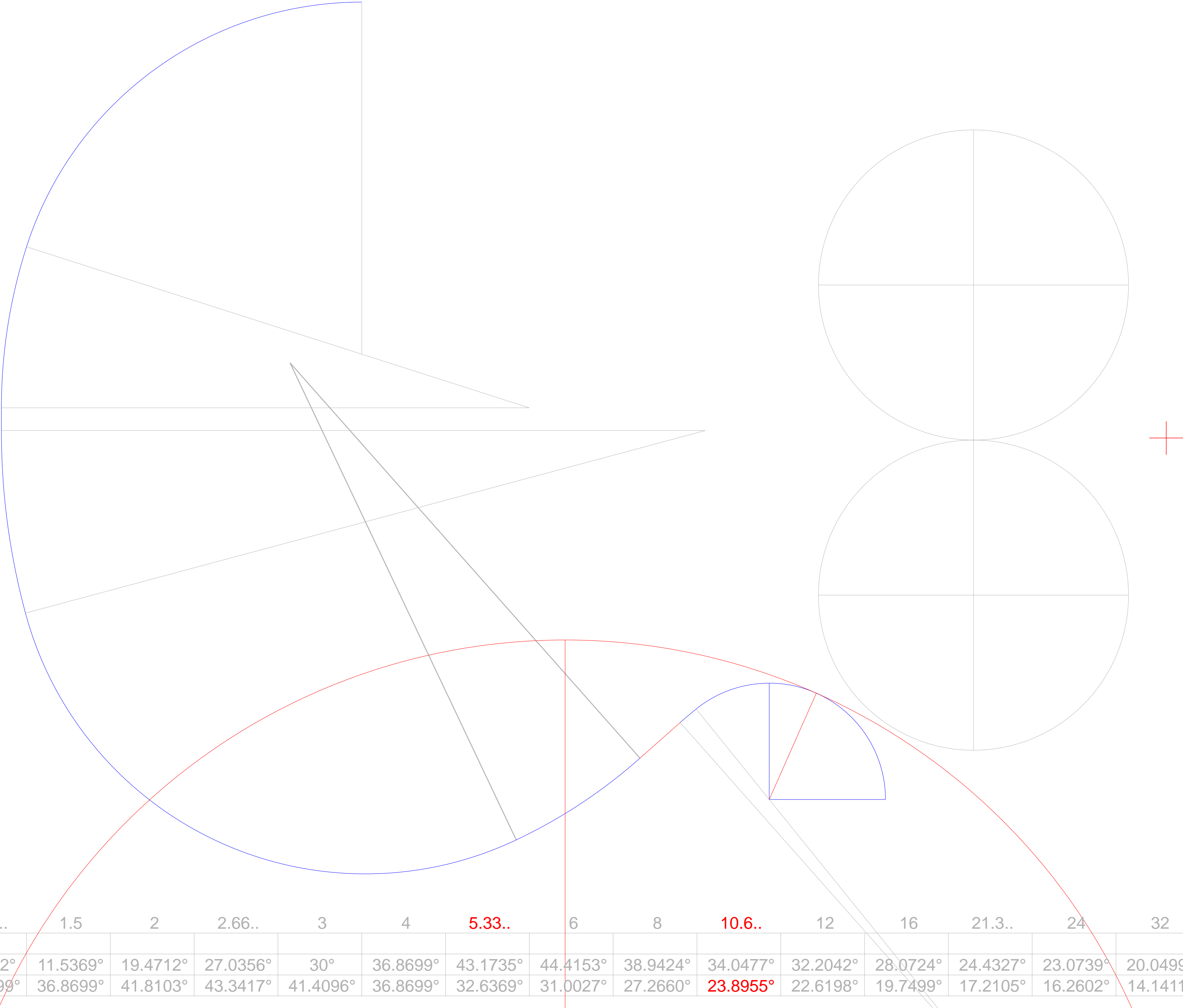
2 B

3 B 6.9375

4 B 9.25

n / p = 5.33.. *2
p / n = 0.1875

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°



Diameter = 27.75
Center = (1.55806, 8.32932)
Angle = 247.3801°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

1.734375

Base

2.3125

1.5 B

2 B

3 B

6.9375

4 B

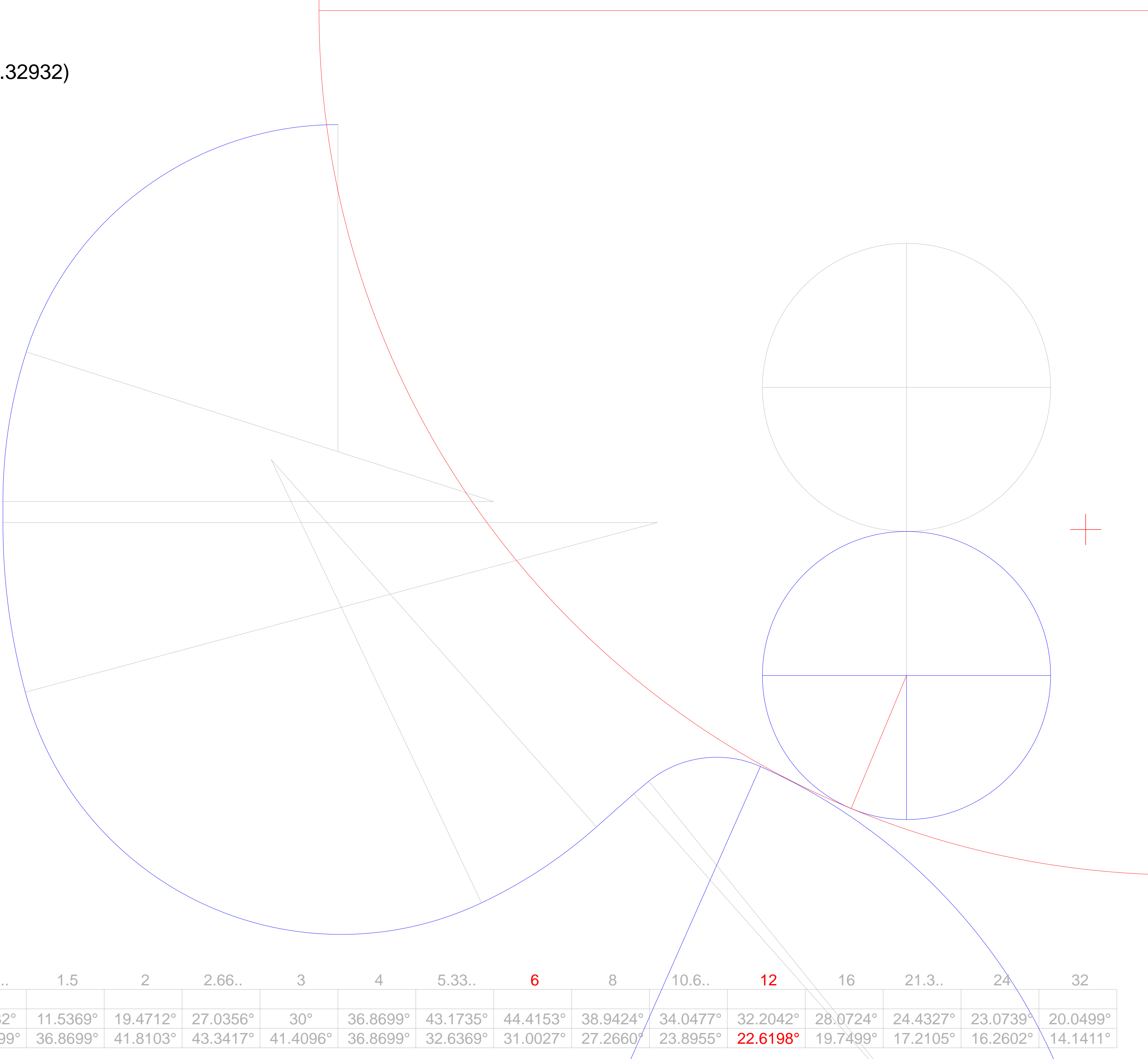
9.25

6 B

13.875

n / p = 6 *2
p / n = 0.166.. /2

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°



Diameter = 3.46875
Center = (-2.79241, -2.91595)
Angle = 278.2132°

- Radius
- 1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B 1.734375

Base 2.3125

1.5 B

2 B

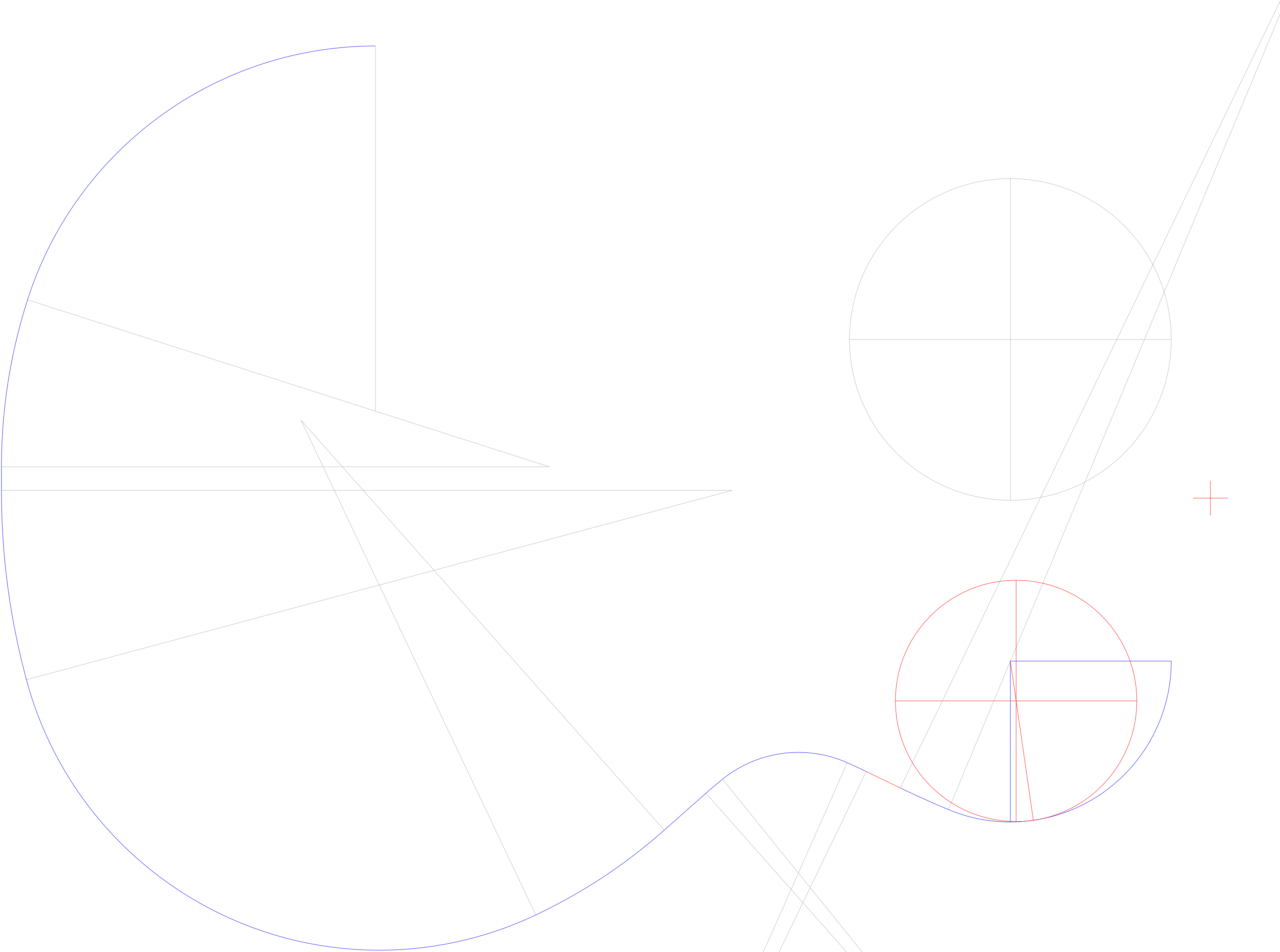
3 B 6.9375

4 B 9.25

6 B 13.875

n / p = 0.75
p / n = 1.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 1.15625
Center = (-2.32991, -3.97567)
Angle = 293.5781°

- Radius
- 1/8 B

3/16 B

1/4 B 0.578125

3/8 B

1/2 B

3/4 B 1.734375

Base 2.3125

1.5 B

2 B

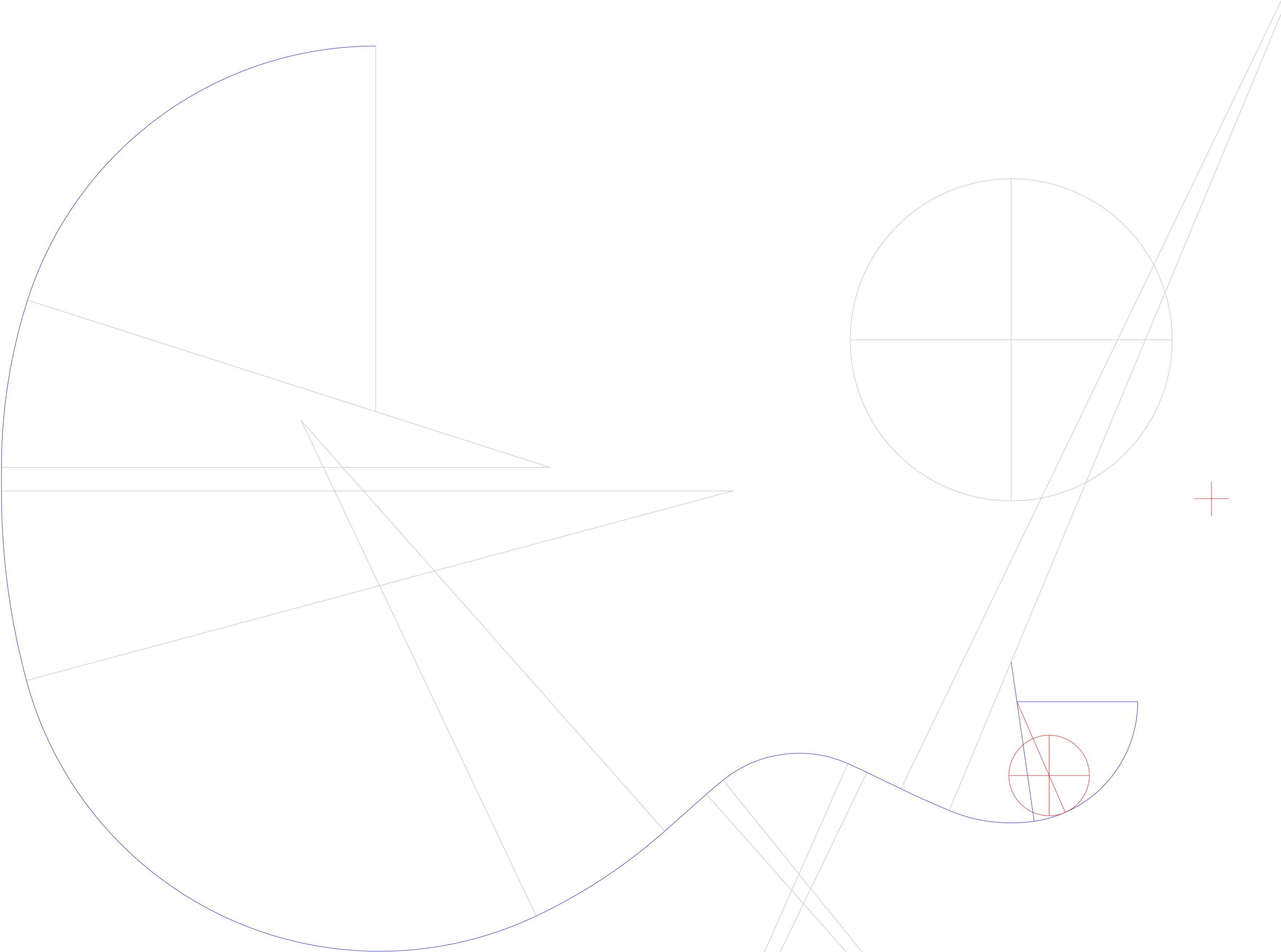
3 B 6.9375

4 B 9.25

6 B 13.875

n / p = 0.33.. *2
p / n = 3

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 0.578125
Center = (-2.1372, -4.19112)
Angle = 311.8103°

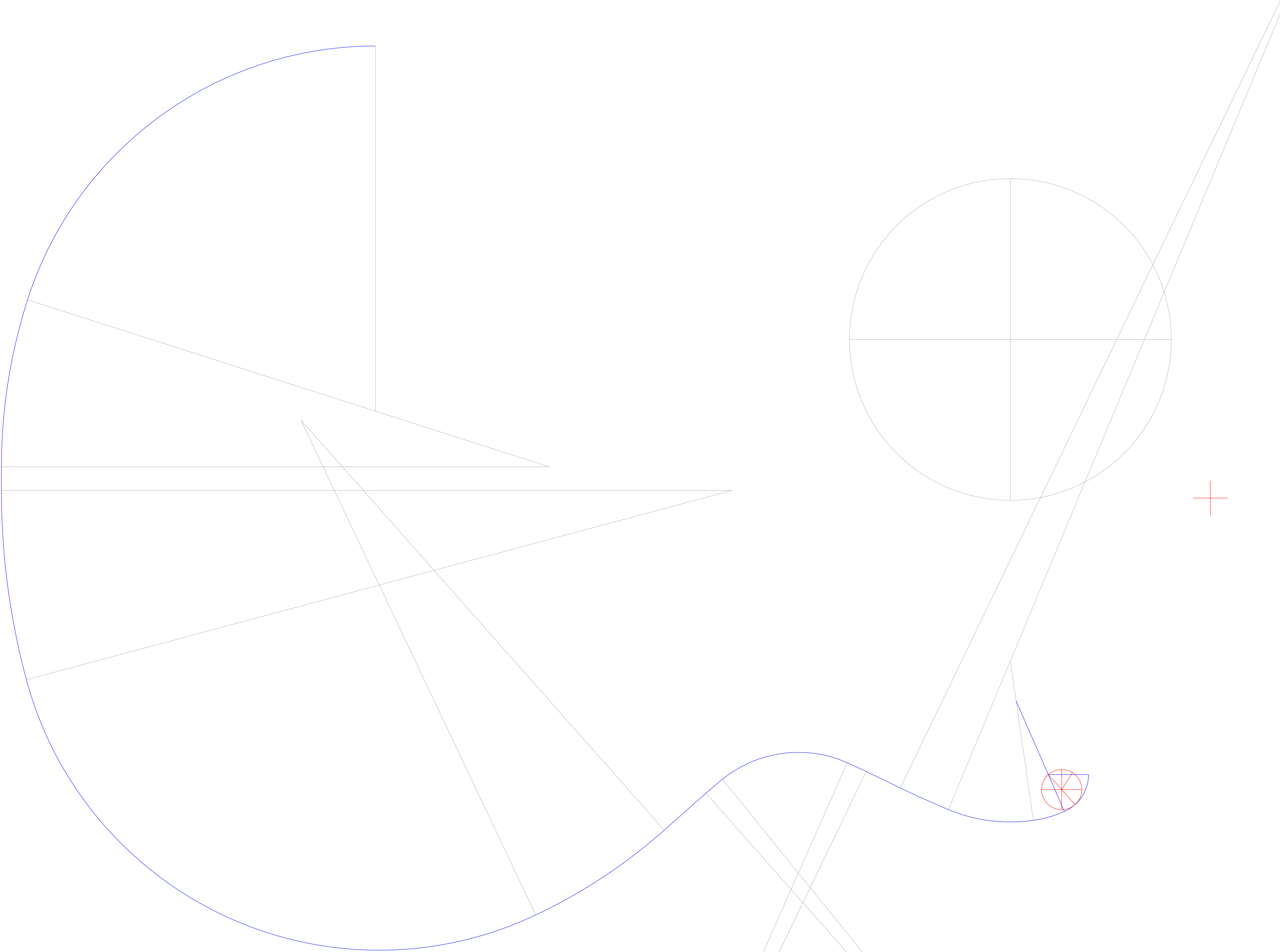
- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B
- 1/2 B
- 3/4 B
- 1.734375
- Base
- 2.3125
- 1.5 B
- 2 B
- 3 B
- 6.9375
- 4 B
- 9.25
- 6 B
- 13.875

n / p = 0.5
p / n = 2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 6.9375

Center = (-0.13452, -1.01143)

Angle = 57.7957°

Radius

1/8 B 0.2890625

3/16 B

1/4 B 0.578125

3/8 B

1/2 B

3/4 B 1.734375

Base 2.3125

1.5 B 3.46875

2 B

3 B 6.9375

4 B 9.25

6 B 13.875

$$n / p = 12$$

$p / n = 0.0833..$

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°

Diameter = 3.46875
Center = (-1.17515, -2.39893)
Angle = 233.1301°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B
- 1/2 B
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B
- 3 B

6.9375
- 4 B

9.25
- 6 B

13.875

n

/

p

= 0.5

/

2

p

/

n

= 2

*

2

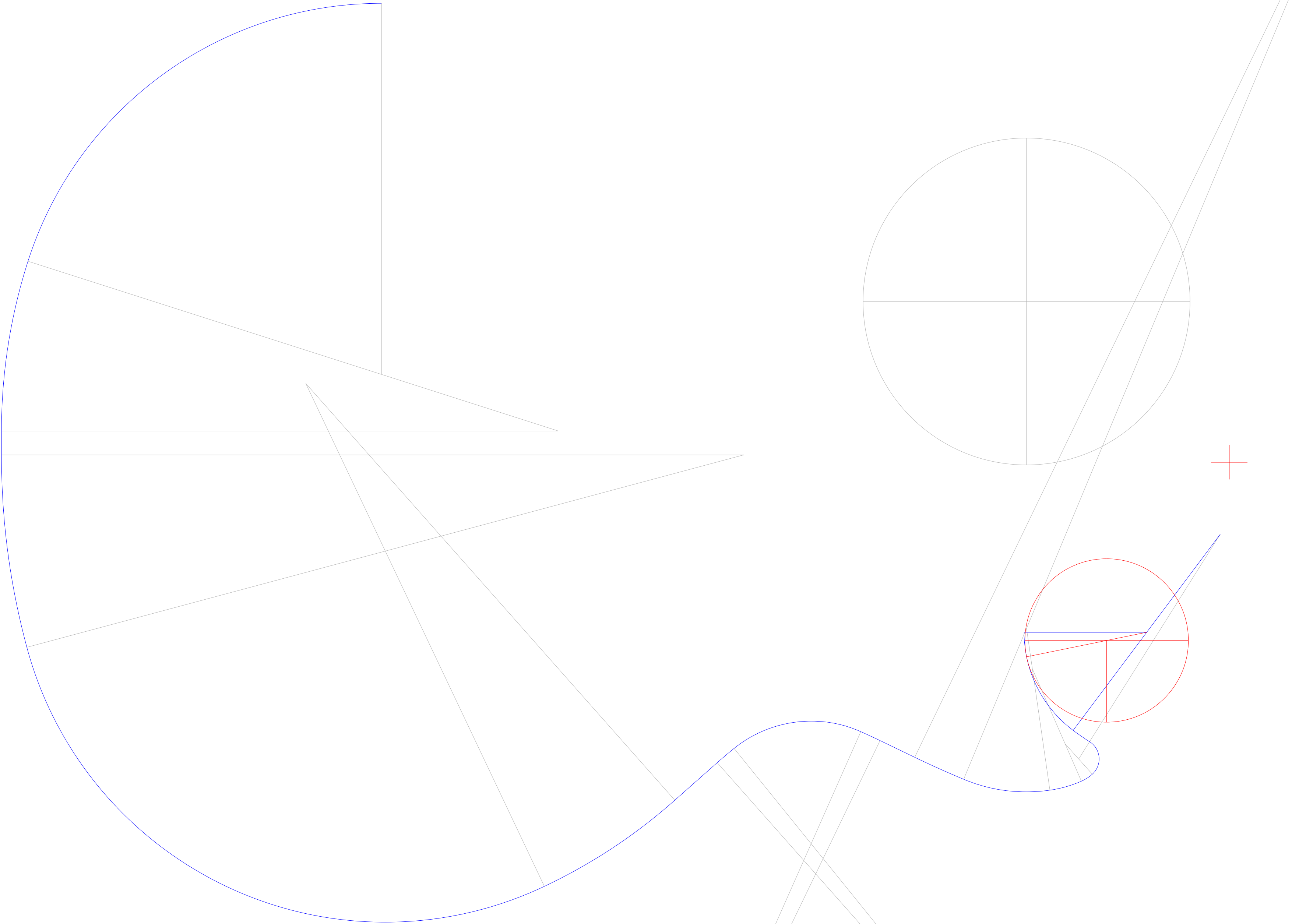
ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 2.3125
Center = (-1.74159, -2.51456)
Angle = 191.5369°

Radius	
1/8 B	0.2890625
3/16 B	
1/4 B	0.578125
3/8 B	
1/2 B	1.15625
3/4 B	1.734375
Base	2.3125
1.5 B	3.46875
2 B	
3 B	6.9375
4 B	9.25
6 B	13.875

n / p = 0.66..
p / n = 1.5

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 1.734375
Center = (-1.91503, -2.28331)
Angle = 126.8698°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B
- 3 B

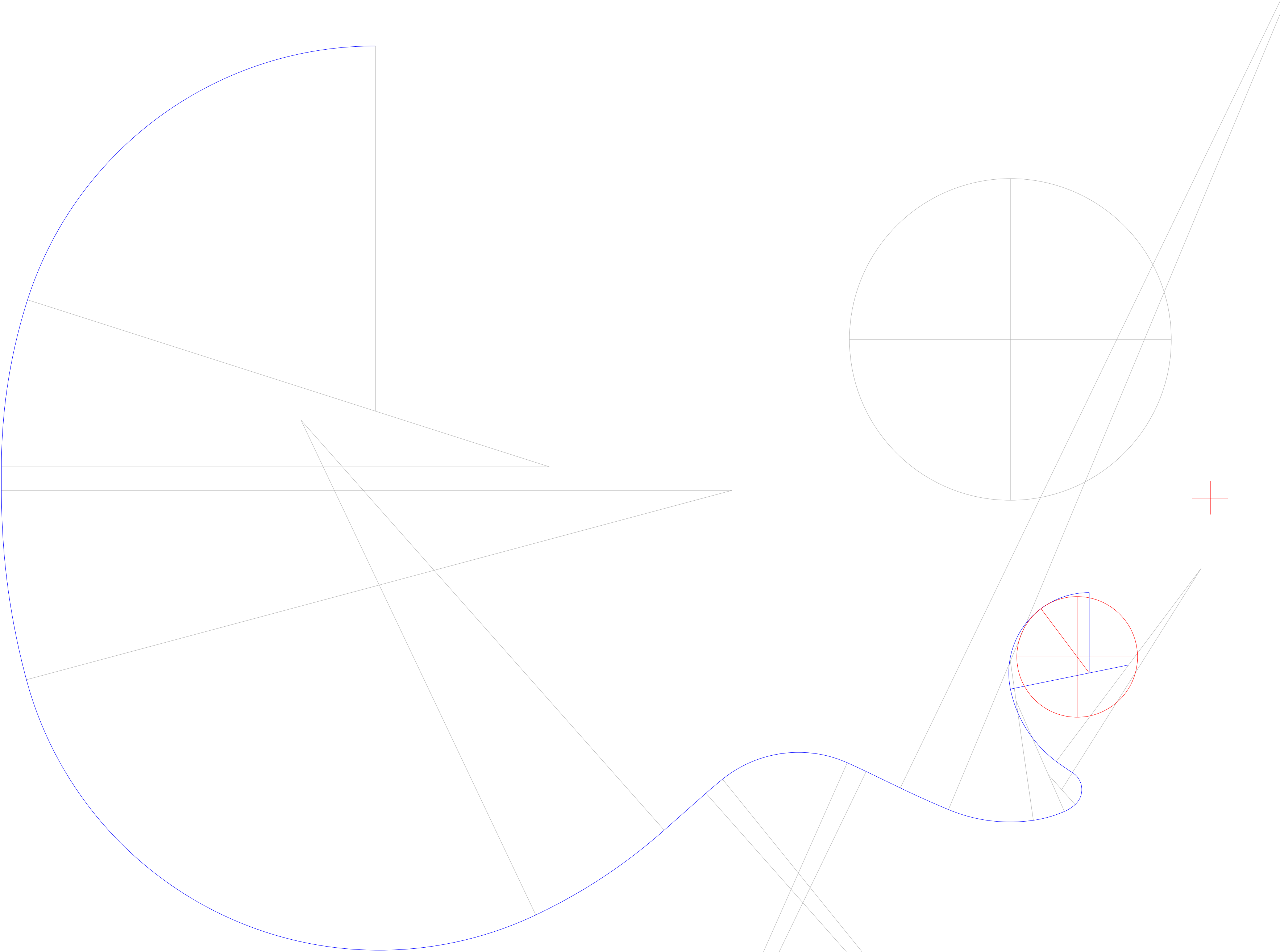
6.9375
- 4 B

9.25
- 6 B

13.875

n / p = 0.75 / or *2
p / n = 1.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1		1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°										
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°		8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°		34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 4.625
Center = (-1.58149, -3.68961)
Angle = 103.3423°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B
- 3 B

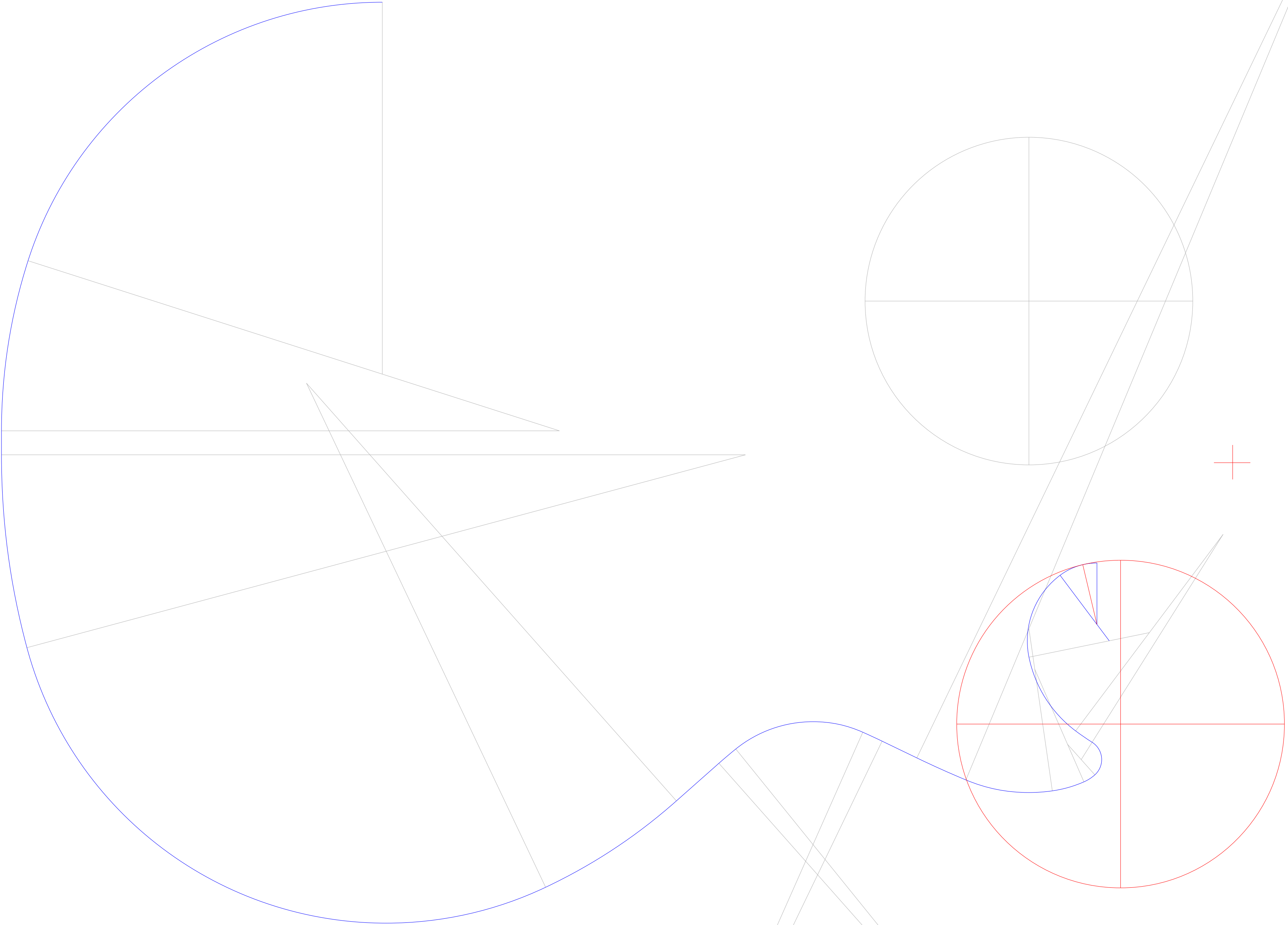
6.9375
- 4 B

9.25
- 6 B

13.875

n / p = 2.66..
p / n = 0.375 /2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

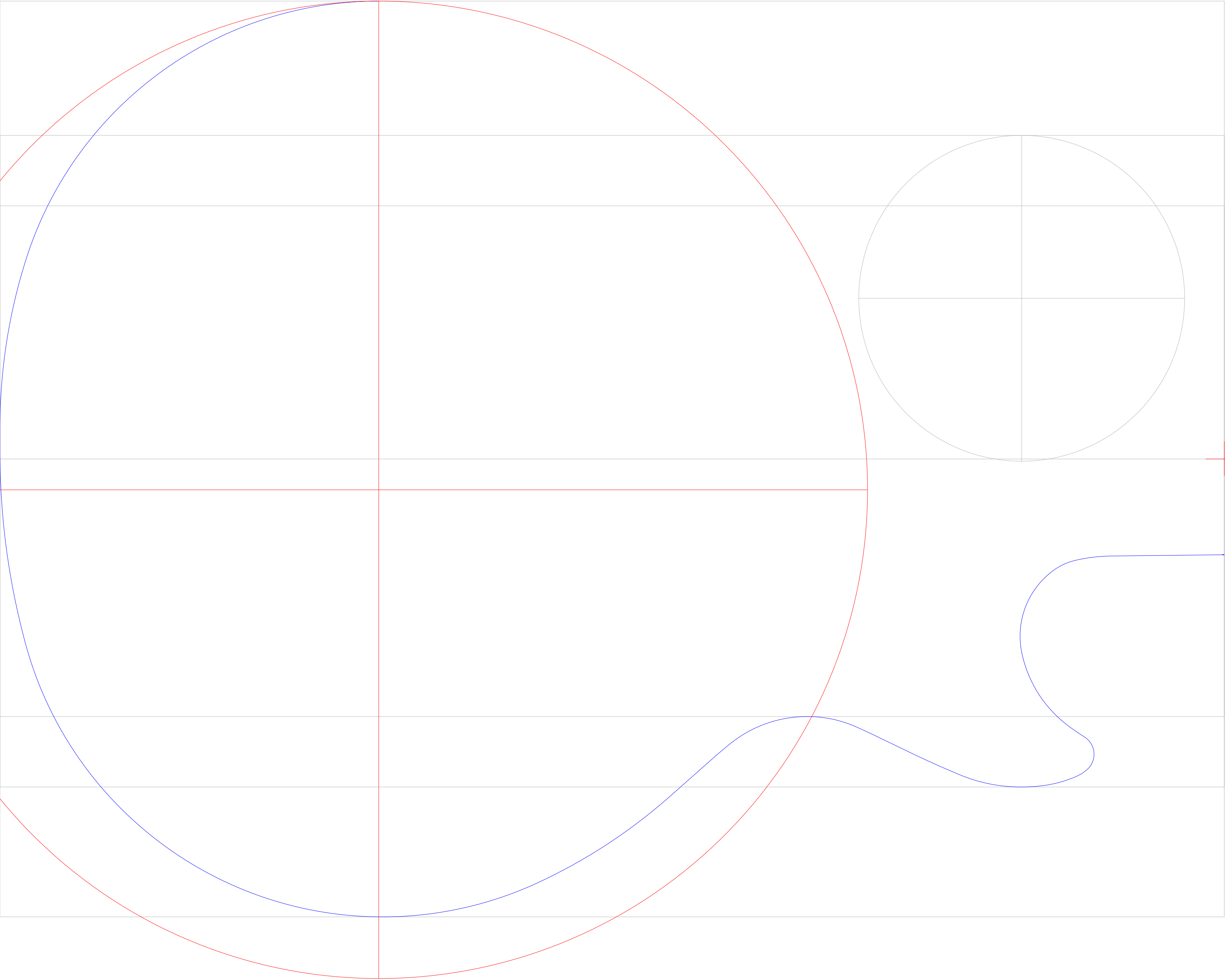


	Radius
1/8 B	0.2890625
3/16 B	
1/4 B	0.578125
3/8 B	0.8671875
1/2 B	1.15625
3/4 B	1.734375
Base	2.3125
1.5 B	3.46875
2 B	
3 B	6.9375
4 B	9.25
6 B	13.875



Diameter = 13.875
Center = (-12, -0.4375)

Radius	
1/8 B	0.2890625
3/16 B	
1/4 B	0.578125
3/8 B	0.8671875
1/2 B	1.15625
3/4 B	1.734375
Base	2.3125
1.5 B	3.46875
2 B	
3 B	6.9375
4 B	9.25
6 B	13.875



Diameter = 9.25

Center = (-11.7608, 1.86259)

Angle = 84.0622°

Radius

1/8 B 0.2890625

3/16 B

1/4 B 0.578125

3/8 B 0.8671875

1/2 B 1.15625

3/4 B 1.734375

Base 2.3125

1.5 B 3.46875

2 B 4.625

3 B 6.9375

4 B 9.25

6 B 13.875

$$n / p = 0.66..$$

$p / n = 1.5 / 16$

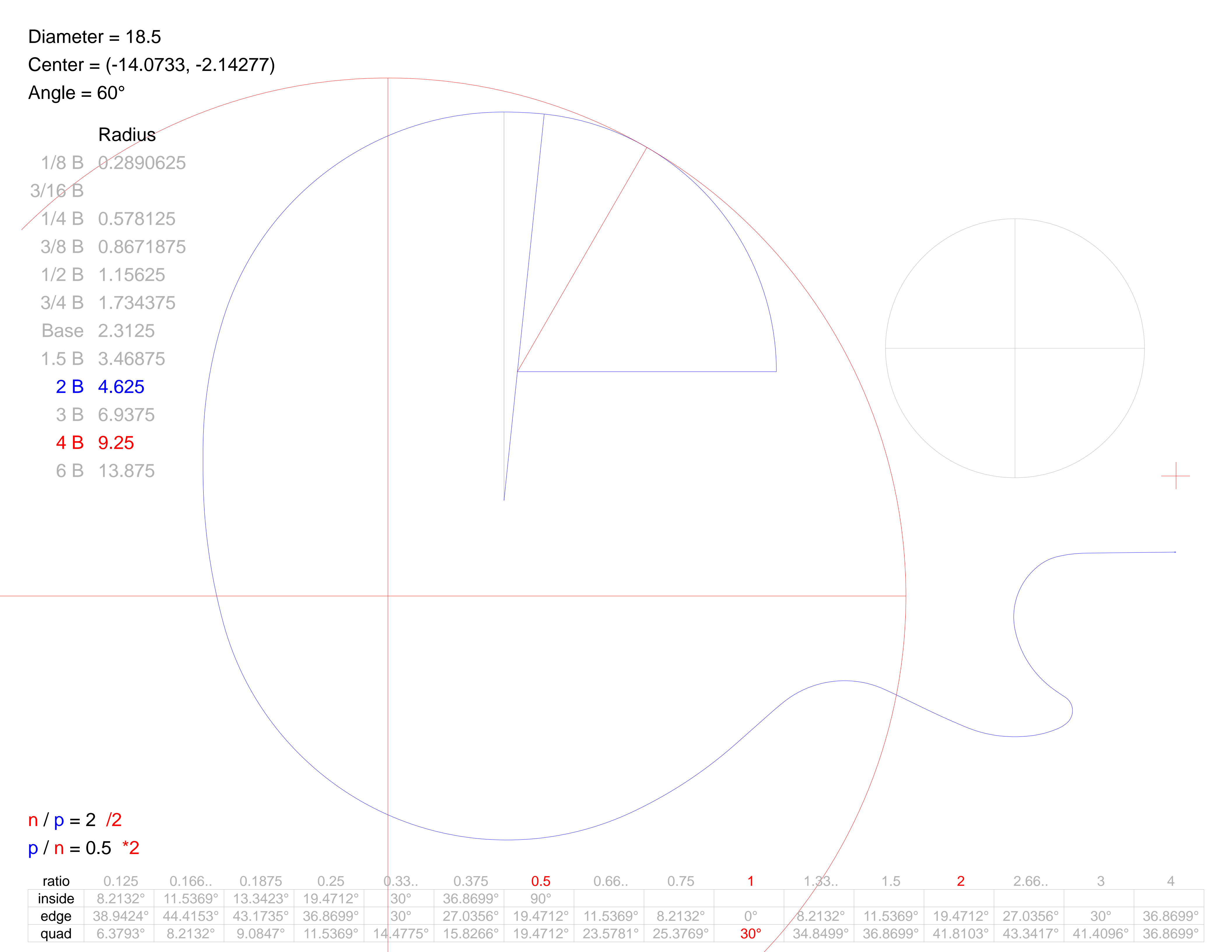
ratio	0.0625	0.083..	0.09375	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2
inside	3.8225°	5.2159°	5.9377°	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°						
edge	28.0724°	32.2042°	34.0477°	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°
quad	3.3722°	4.4117°	4.9171°	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°

Diameter = 18.5
Center = (-14.0733, -2.14277)
Angle = 60°

- Radius
- 1/8 B 0.2890625
 - 3/16 B
 - 1/4 B 0.578125
 - 3/8 B 0.8671875
 - 1/2 B 1.15625
 - 3/4 B 1.734375
 - Base 2.3125
 - 1.5 B 3.46875
 - 2 B 4.625**
 - 3 B 6.9375
 - 4 B 9.25**
 - 6 B 13.875

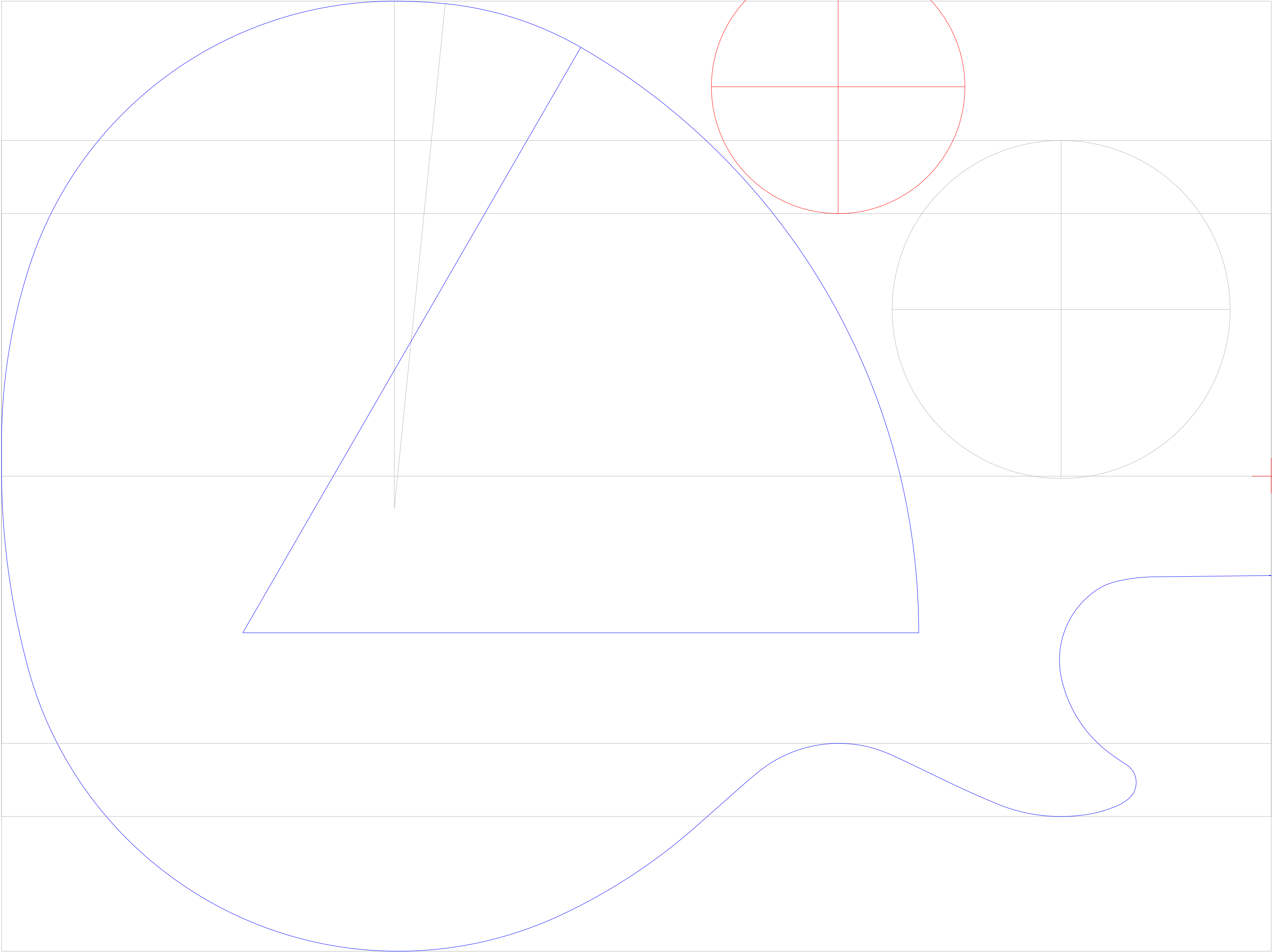
$n / p = 2 / 2$
 $p / n = 0.5 * 2$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 3.46875
Center = (-5.92639, 5.32812)

Radius	
1/8 B	0.2890625
3/16 B	
1/4 B	0.578125
3/8 B	0.8671875
1/2 B	1.15625
3/4 B	1.734375
Base	2.3125
1.5 B	3.46875
2 B	4.625
3 B	6.9375
4 B	9.25
6 B	13.875



Diameter = 6.9375
Center = (-5.05921, 6.83014)
Angle = 240°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

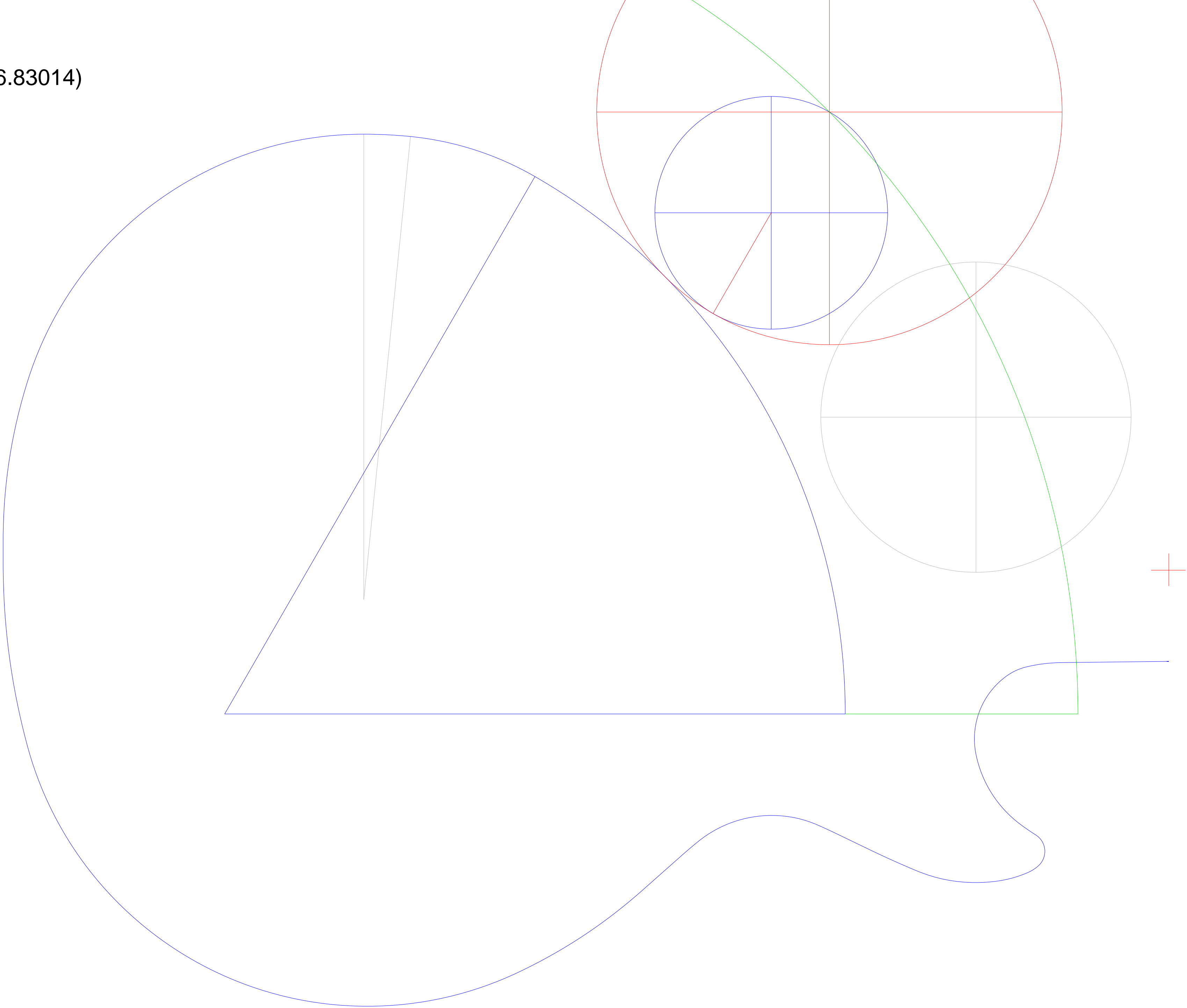
3.46875
- 2 B

4.625
- 3 B

6.9375
- 4 B

9.25
- 6 B

13.875



$n / p = 2 / 2$
 $p / n = 0.5 * 2$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 13.875
Center = (-7.71023, 10.2159)
Angle = 290.0499°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B

4.625
- 3 B

6.9375
- 4 B

9.25
- 6 B

13.875

n

/

p

=

4

*

8

p

/

n

=

0.25

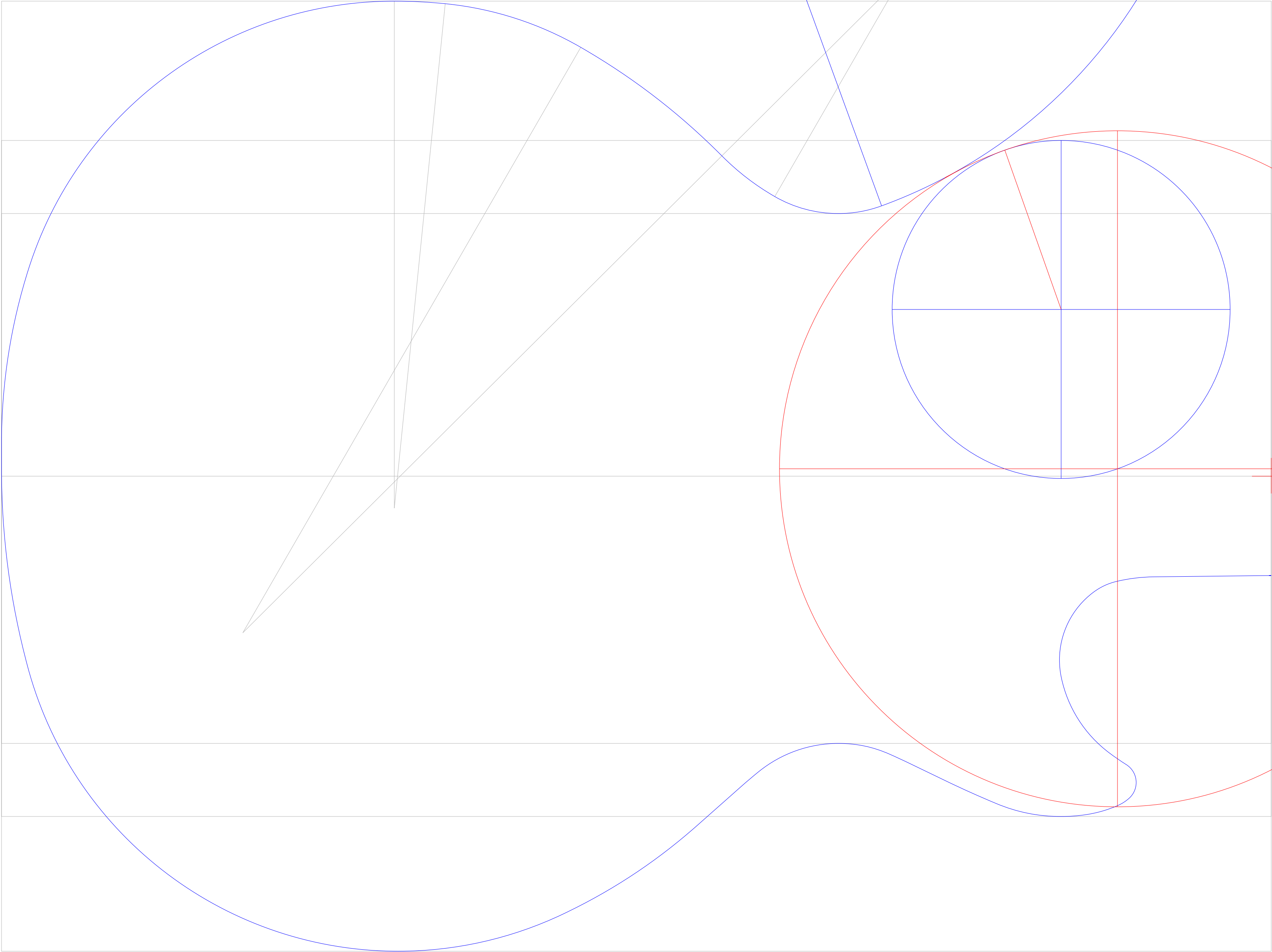
/

8

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°

Diameter = 9.25
Center = (-2.10417, 0.101004)
Angle = 109.7499°

	Radius
1/8 B	0.2890625
3/16 B	
1/4 B	0.578125
3/8 B	0.8671875
1/2 B	1.15625
3/4 B	1.734375
Base	2.3125
1.5 B	3.46875
2 B	4.625
3 B	6.9375
4 B	9.25
6 B	13.875



n / p = 2
p / n = 0.5

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 6.9375
Center = (-3.3375, 1.22153)
Angle = 66.4218°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

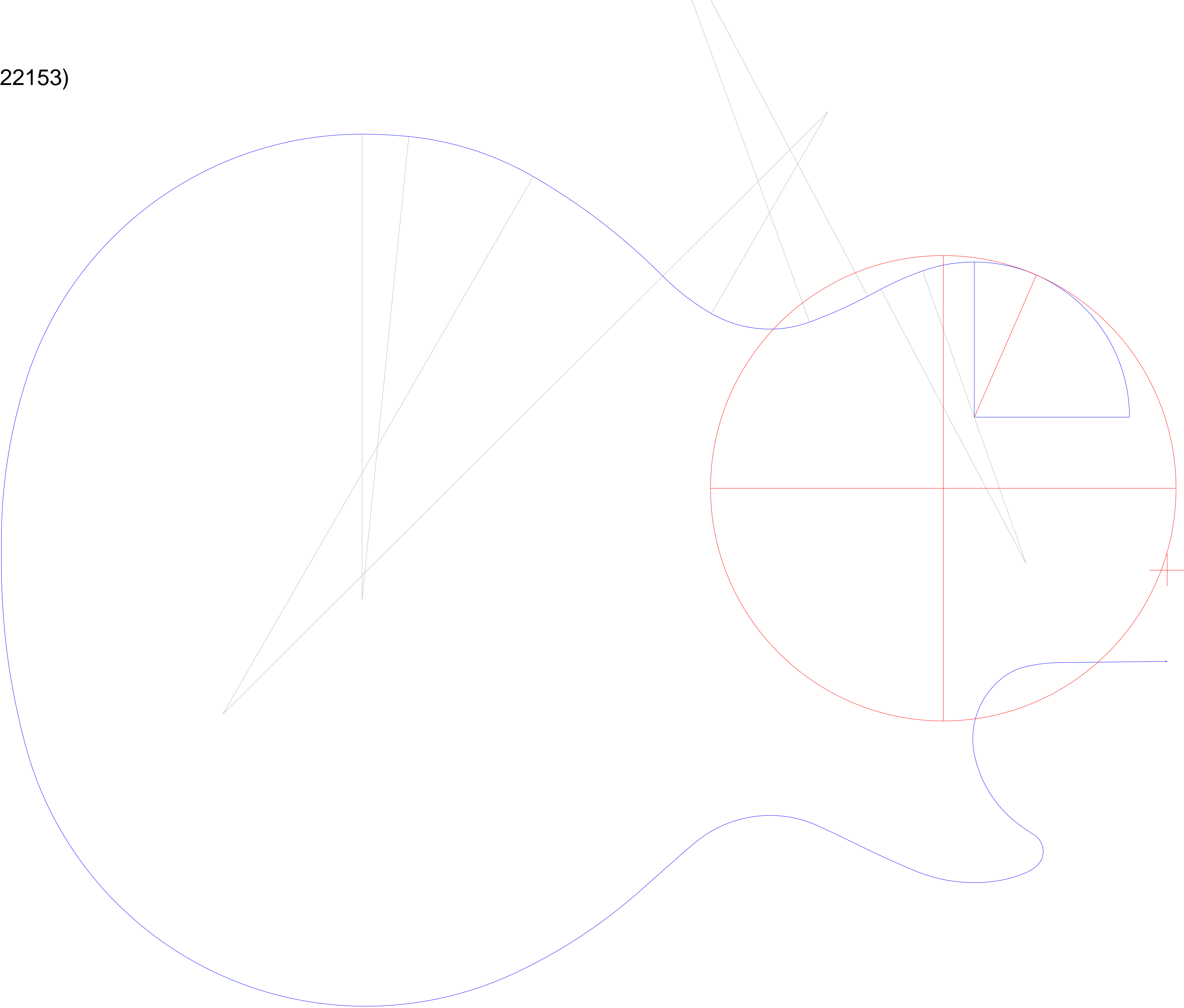
3.46875
- 2 B

4.625
- 3 B

6.9375
- 4 B

9.25
- 6 B

13.875



n / p = 1.5
p / n = 0.66

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 4.625
Center = (-2.64375, 2.14653)
Angle = 53.1301°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B

4.625
- 3 B

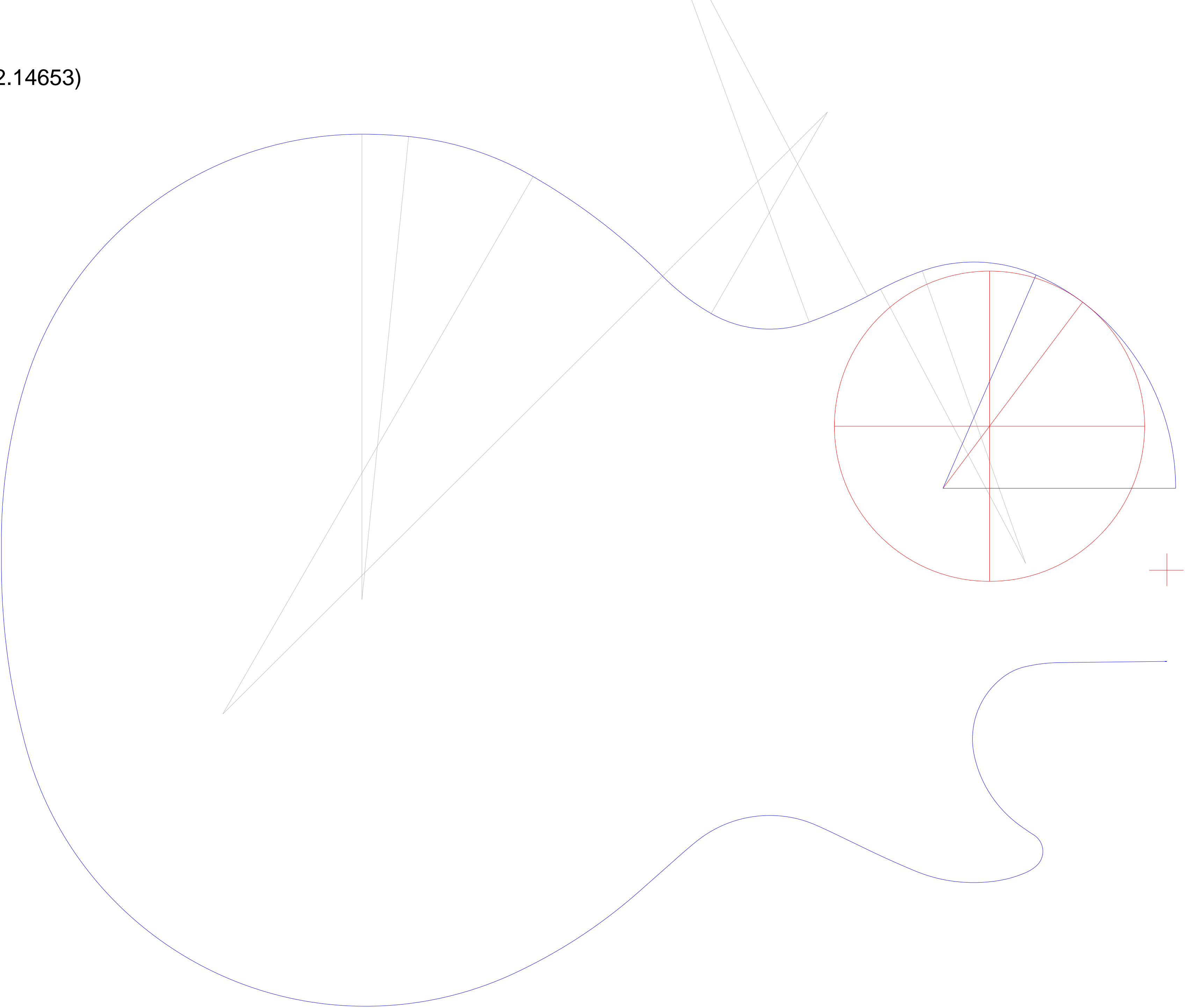
6.9375
- 4 B

9.25
- 6 B

13.875

n / p = 0.66..
p / n = 1.5

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 6.9375
Center = (-3.61743, 1.52295)
Angle = 32.6368°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

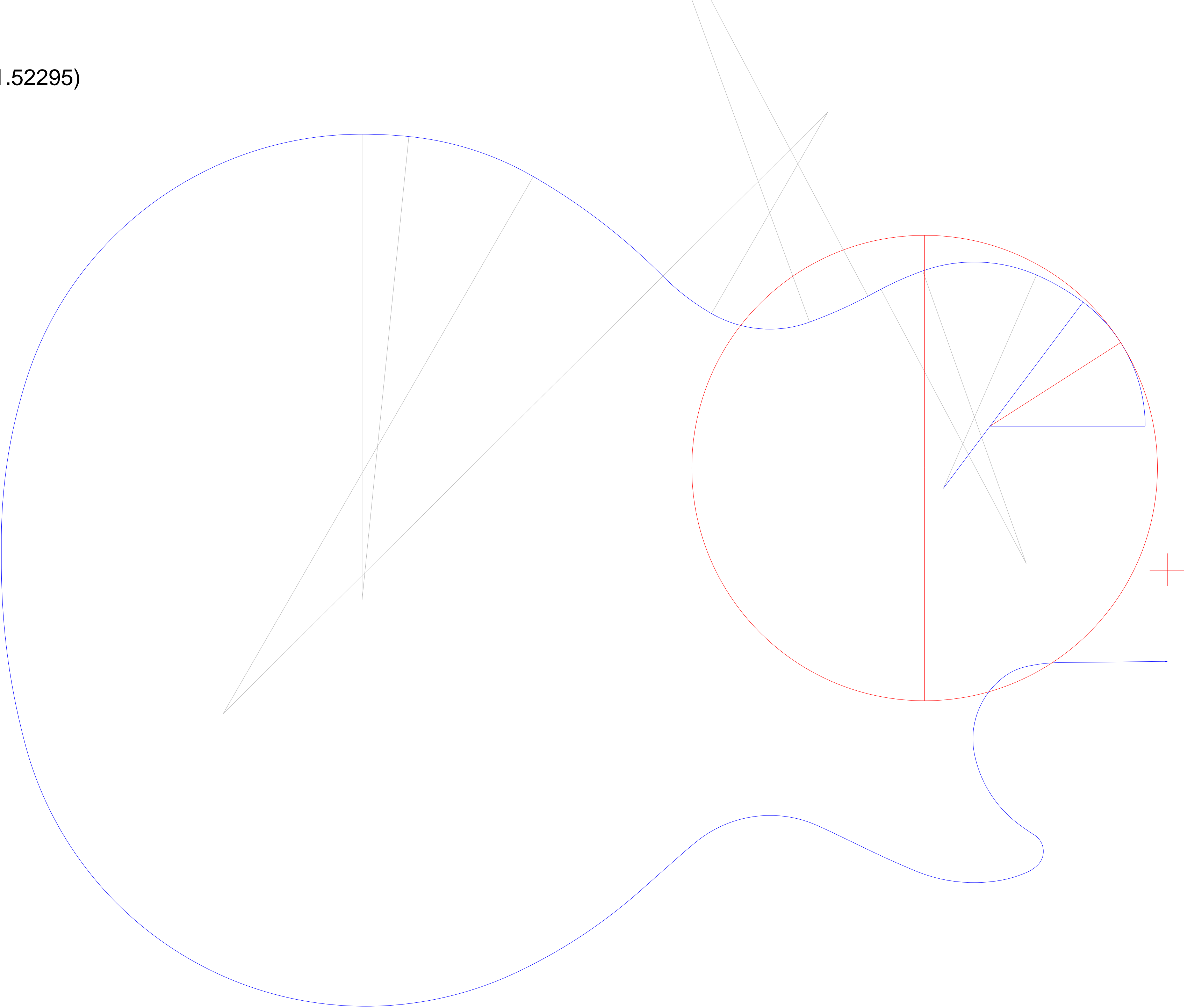
3.46875
- 2 B

4.625
- 3 B

6.9375
- 4 B

9.25
- 6 B

13.875



n / p = 1.5
p / n = 0.66.. *8

ratio	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16
inside	90°															
edge	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°
quad	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°

Diameter = 18.5
Center = (-9.28188, 0.366698)
Angle = 11.5369°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B

4.625
- 3 B

6.9375
- 4 B

9.25
- 6 B

13.875

n

 /

p

 = 2.66.. /4

p

 /

n

 = 0.375

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 37
Center = (-18.5113, -0.249968)
Angle = 3.8225°

- Radius
- 1/8 B

0.2890625
- 3/16 B
- 1/4 B

0.578125
- 3/8 B

0.8671875
- 1/2 B

1.15625
- 3/4 B

1.734375
- Base

2.3125
- 1.5 B

3.46875
- 2 B

4.625
- 3 B

6.9375
- 4 B

9.25
- 6 B

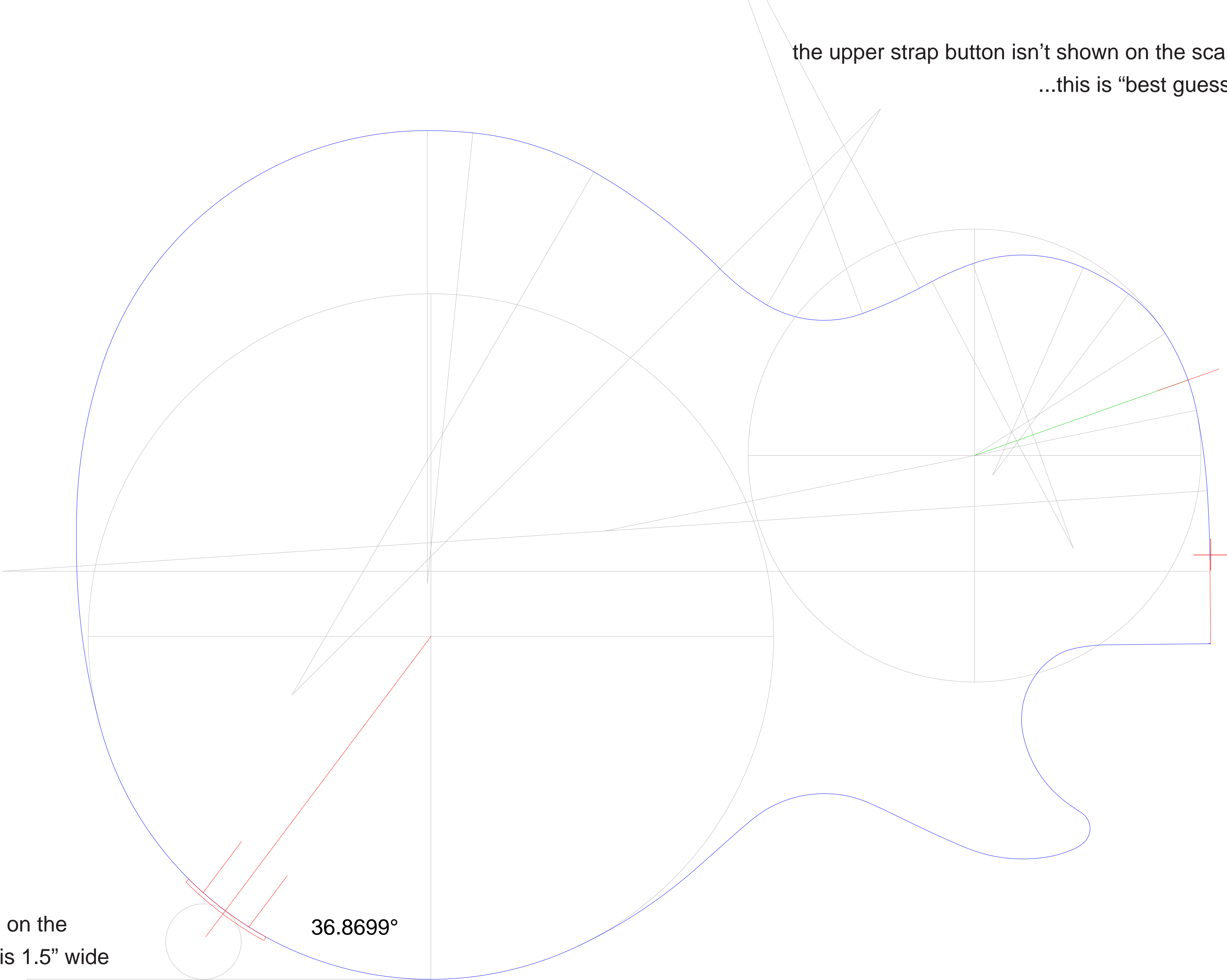
13.875
- 8 B

18.5

n / p = 2
p / n = 0.5 /8

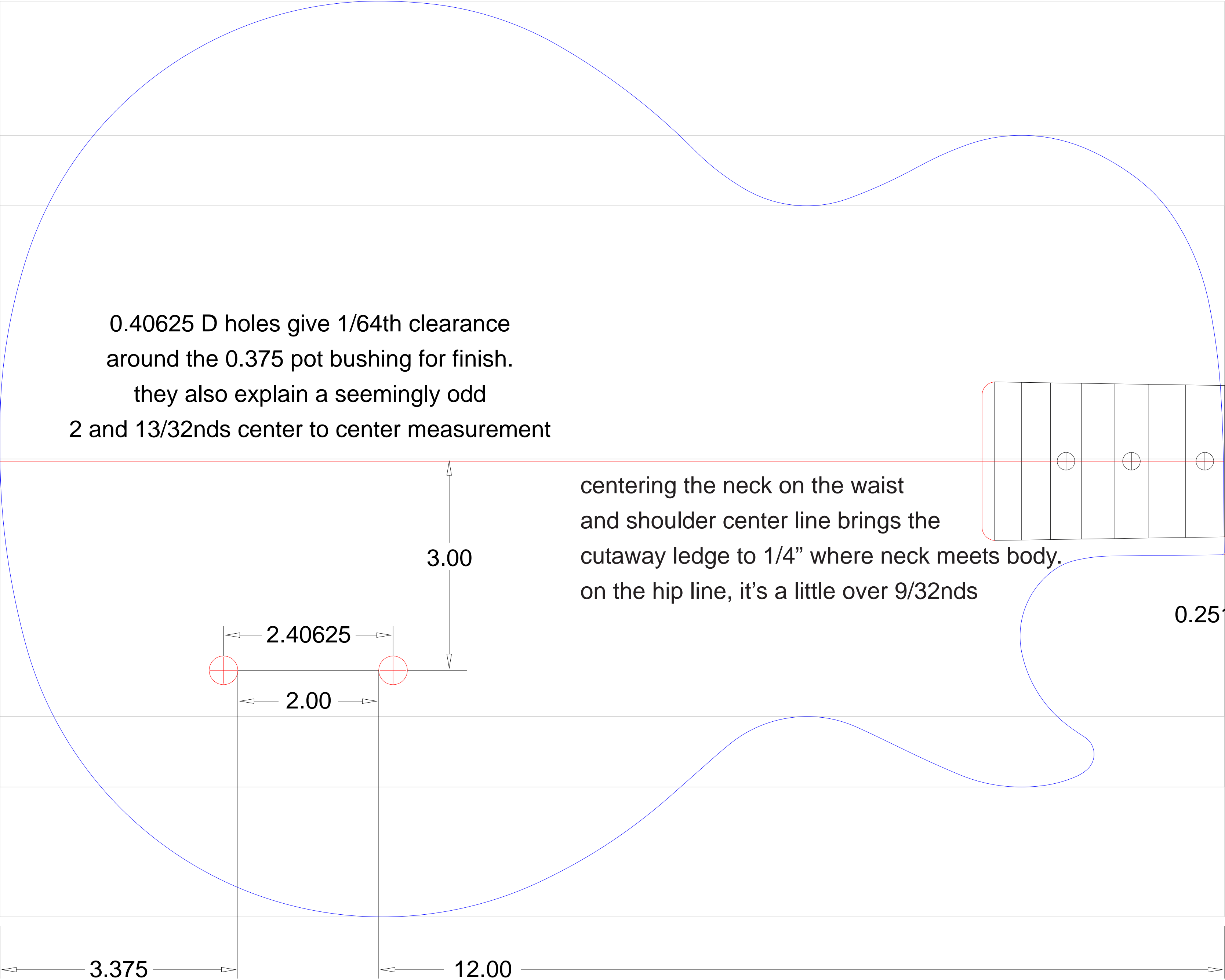
ratio	0.03125	0.0416..	0.046875	0.0625	0.083..	0.09375	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1
inside	1.8485°	2.4919°	2.8189°	3.8225°	5.2159°	5.9377°	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°			
edge	20.0499°	23.0739°	24.4327°	28.0724°	32.2042°	34.0477°	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°
quad	1.7365°	2.2924°	2.5663°	3.3722°	4.4117°	4.9171°	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°

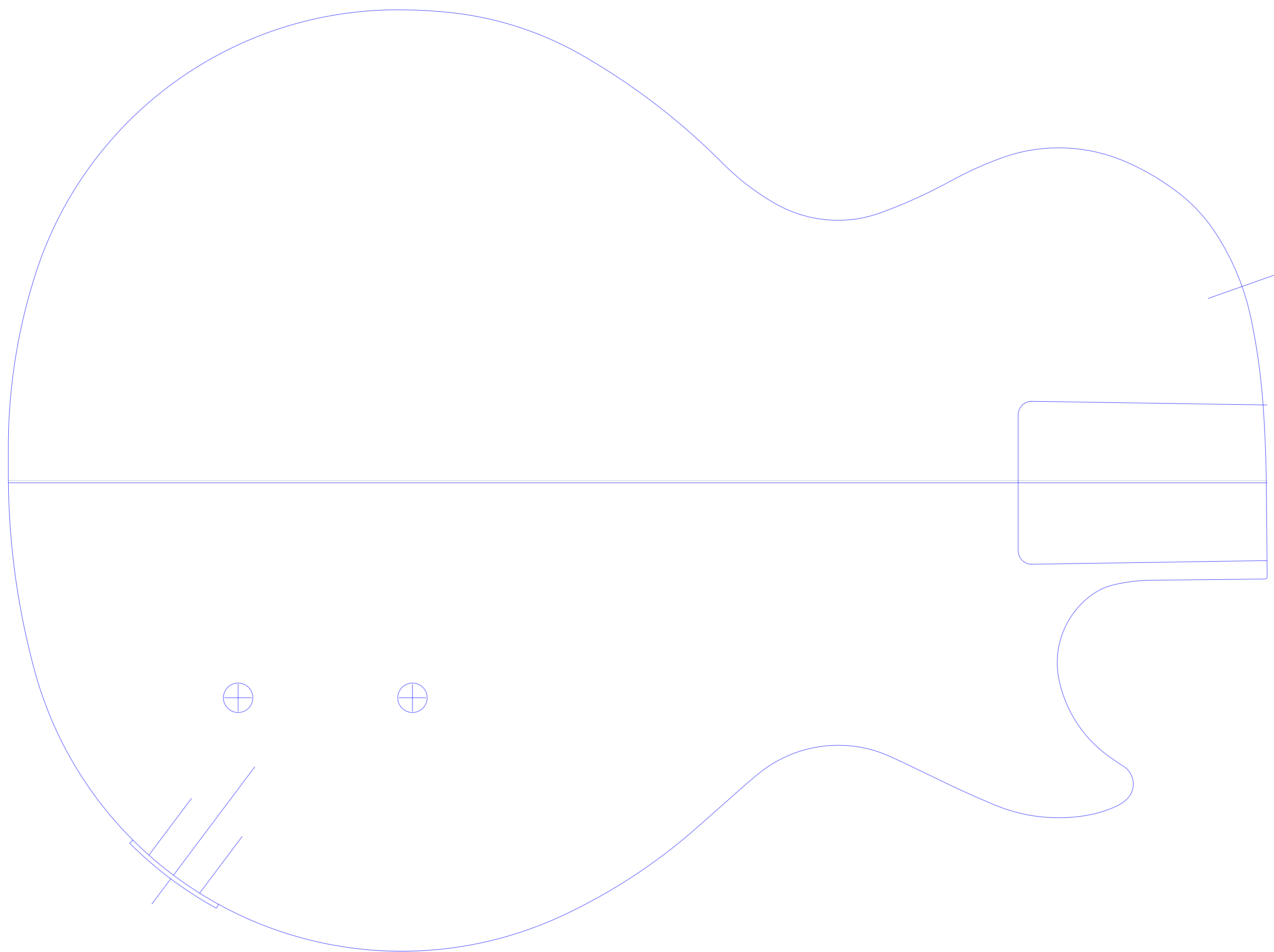
the upper strap button isn't shown on the scan
...this is "best guess"



the jack plate on the guitar traced is 1.5" wide

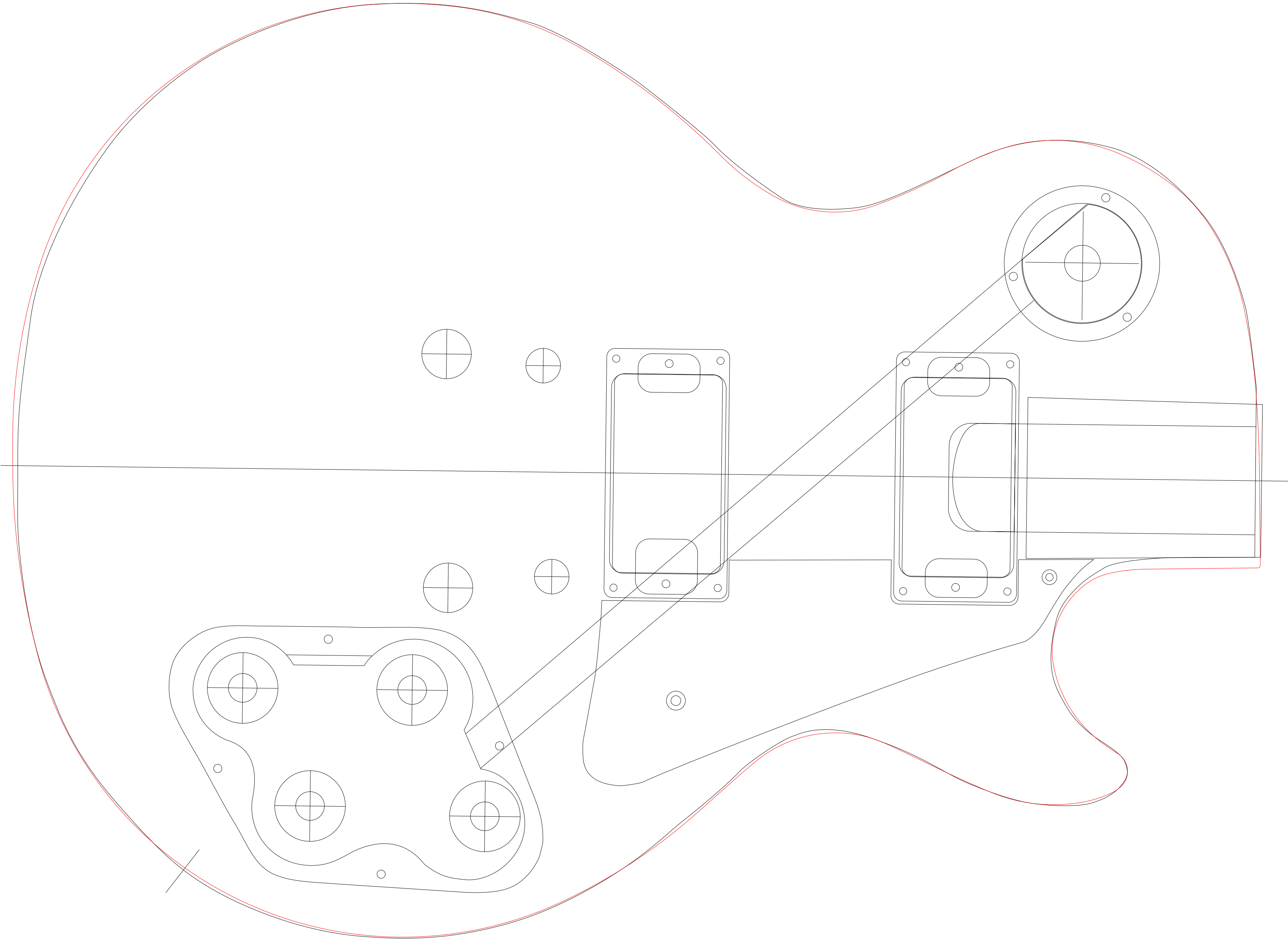
ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°





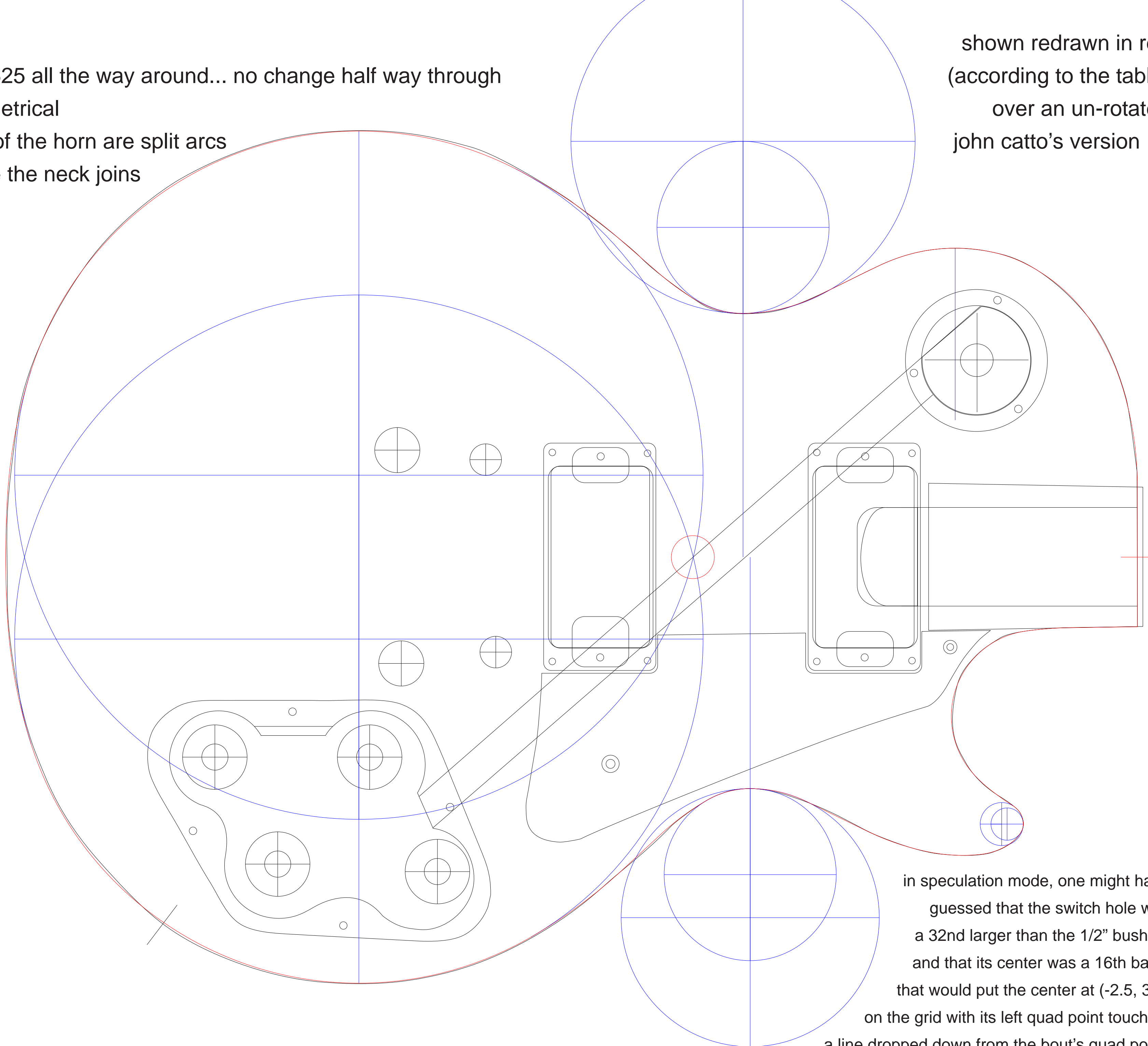
so is the junior just a rotated senior with a modified cut-away?
close... but not really.

shown here over john catto's version 10
rotated 0.7 degrees clock-wise



on the LP...
the radius base is 2.625 all the way around... no change half way through
the butt end is sytmmetrical
the waists and point of the horn are split arcs
the edge is flat where the neck joins
etc...

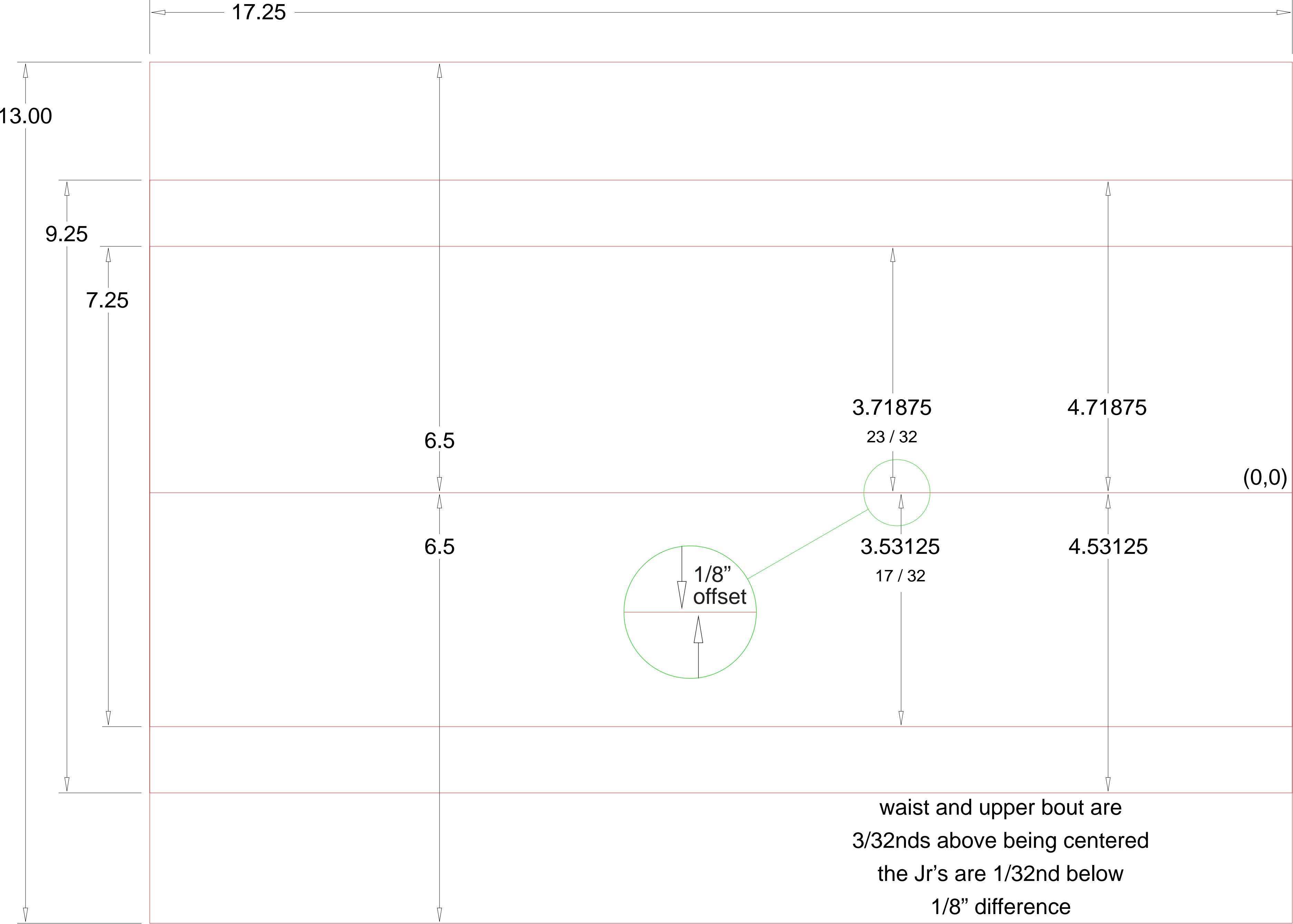
shown redrawn in red
(according to the table)
over an un-rotated
john catto's version 10



in speculation mode, one might have
guessed that the switch hole was
a 32nd larger than the 1/2" bushing
and that its center was a 16th back.
that would put the center at (-2.5, 3.0)
on the grid with its left quad point touching
a line dropped down from the bout's quad point.

without having measured one, it would seem to make sense.

no scan of an LP, but let's run Catto's outline to see what happens



Diameter = 10.5

Center = (-11.875, 1.25)

Center = (-11.875, -1.25)

set on grid

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

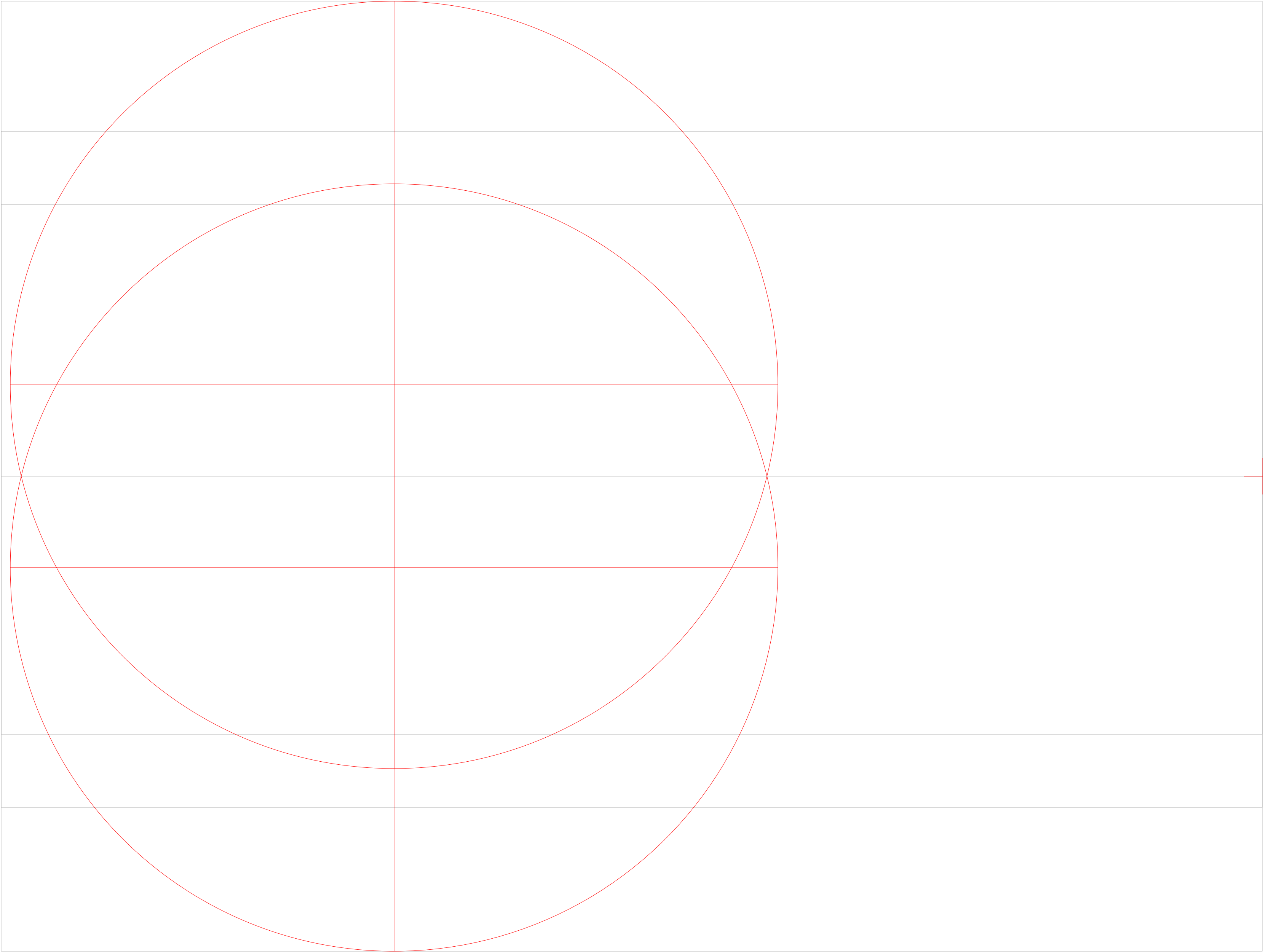
Base

1.5 B

2 B 5.25

3 B

4 B



Diameter = 15.75

Center = (-9.375, 0.449609)

Center = (-9.375, -0.449609)

from manufactured intersections

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

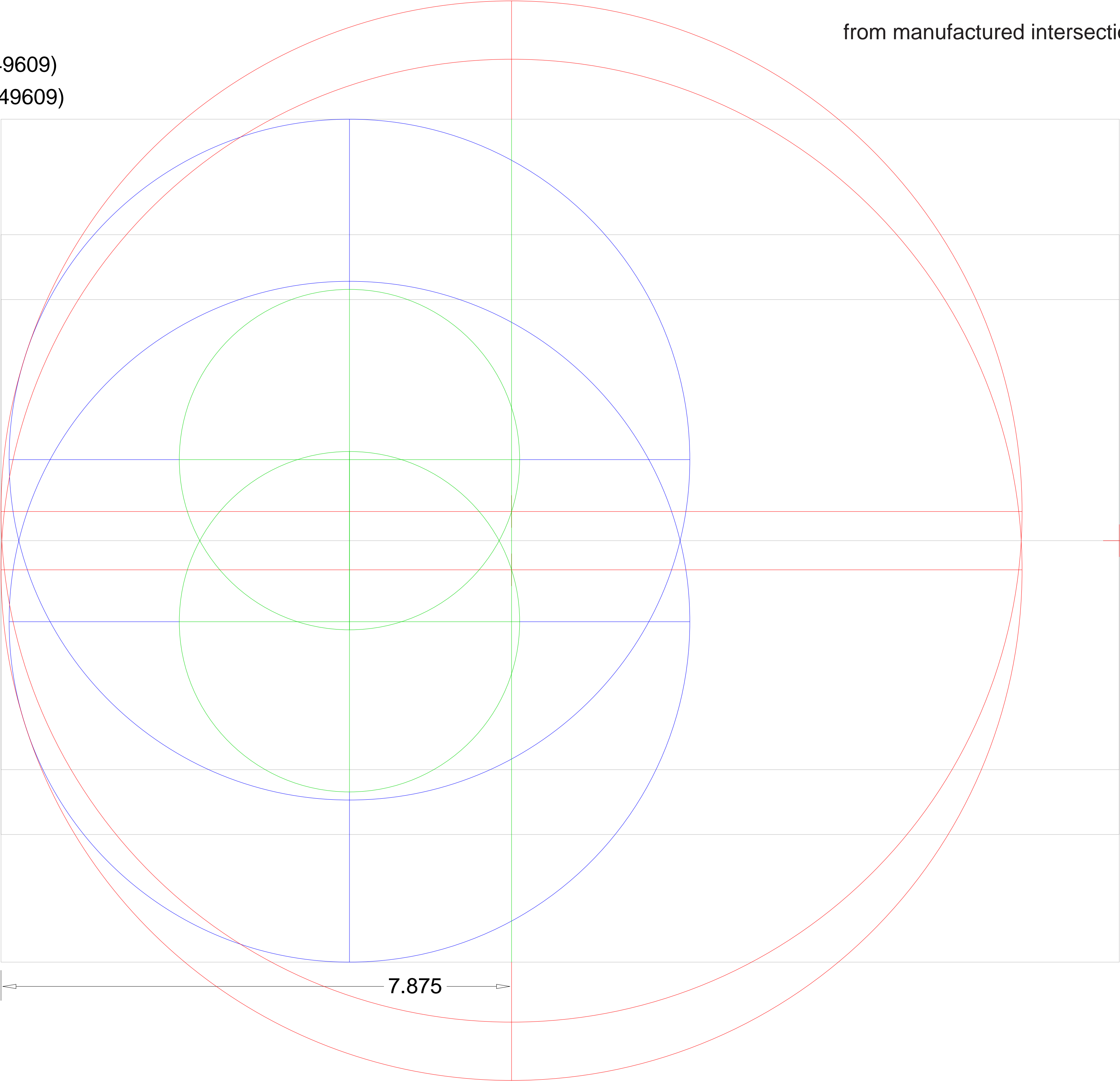
Base 2.625

1.5 B

2 B 5.25

3 B 7.875

4 B



Diameter = 31.5
Center = (-1.51285, 0)

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

Base 2.625

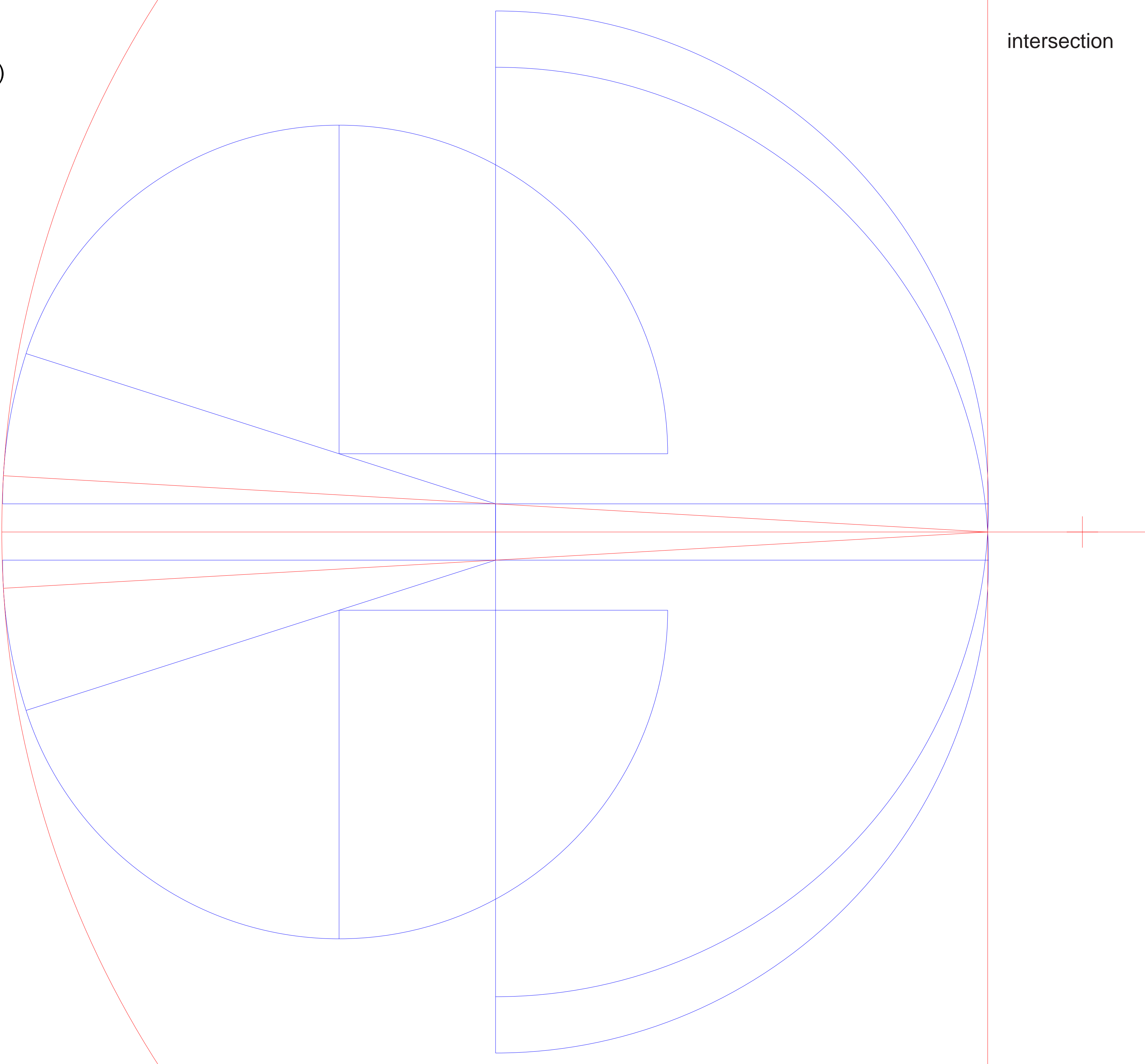
1.5 B

2 B 5.25

3 B 7.875

4 B

6 B 15.75

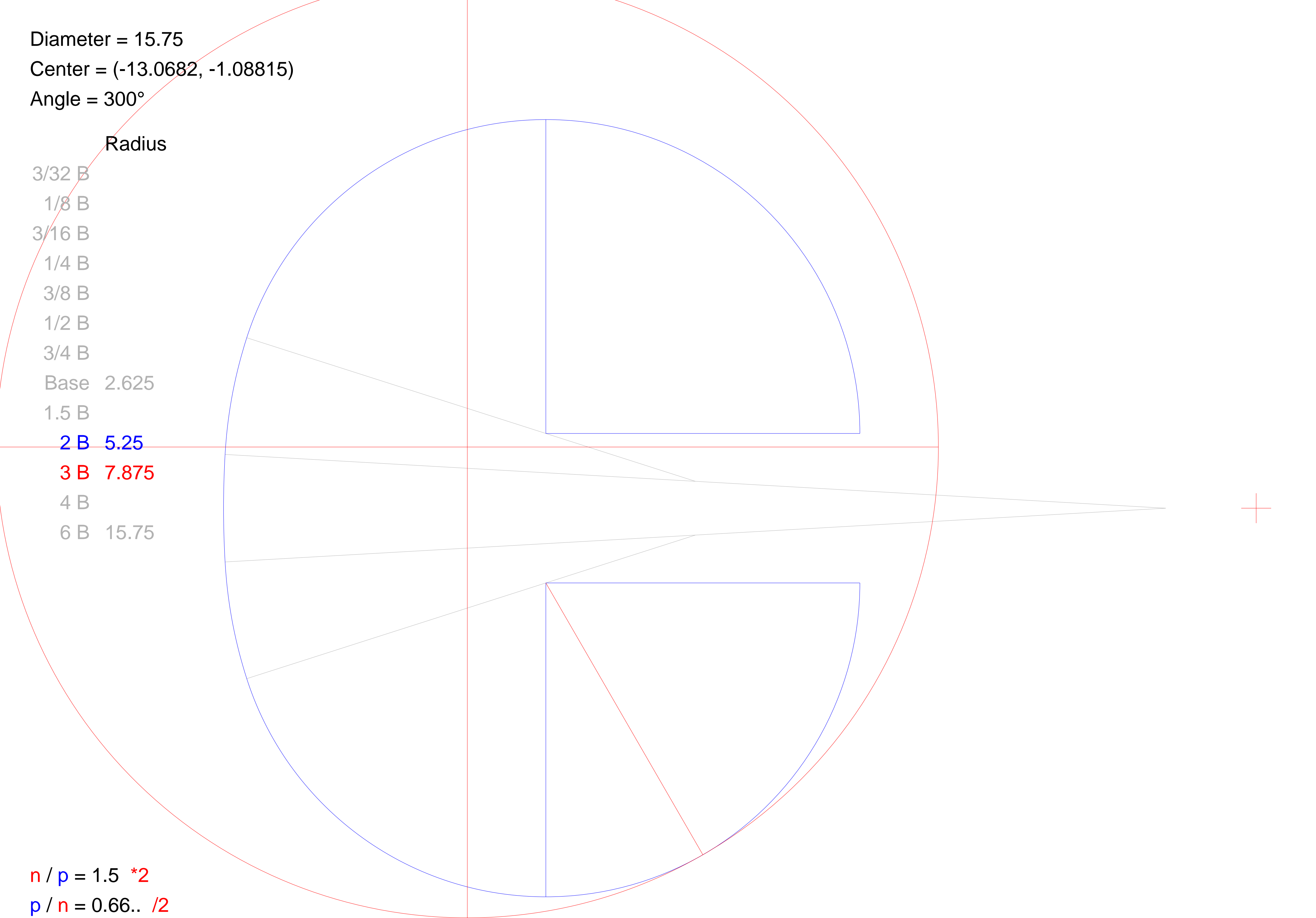


Diameter = 15.75
Center = (-13.0682, -1.08815)
Angle = 300°

- Radius
- 3/32 B
 - 1/8 B
 - 3/16 B
 - 1/4 B
 - 3/8 B
 - 1/2 B
 - 3/4 B
 - Base 2.625
 - 1.5 B
 - 2 B 5.25
 - 3 B 7.875
 - 4 B
 - 6 B 15.75

$n / p = 1.5 \cdot 2$
 $p / n = 0.66\ldots / 2$

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 15.75
Center = (-13.1875, 1.02332)
Angle = 62.9643°

asymmetry
top angle = 27.0357
bottom = 30.0000

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B

3/4 B

Base 2.625

1.5 B

2 B 5.25

3 B 7.875

4 B

6 B 15.75

on the jr, the 30 was on top

n / p = 1.5 /4

p / n = 0.66.. *4

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

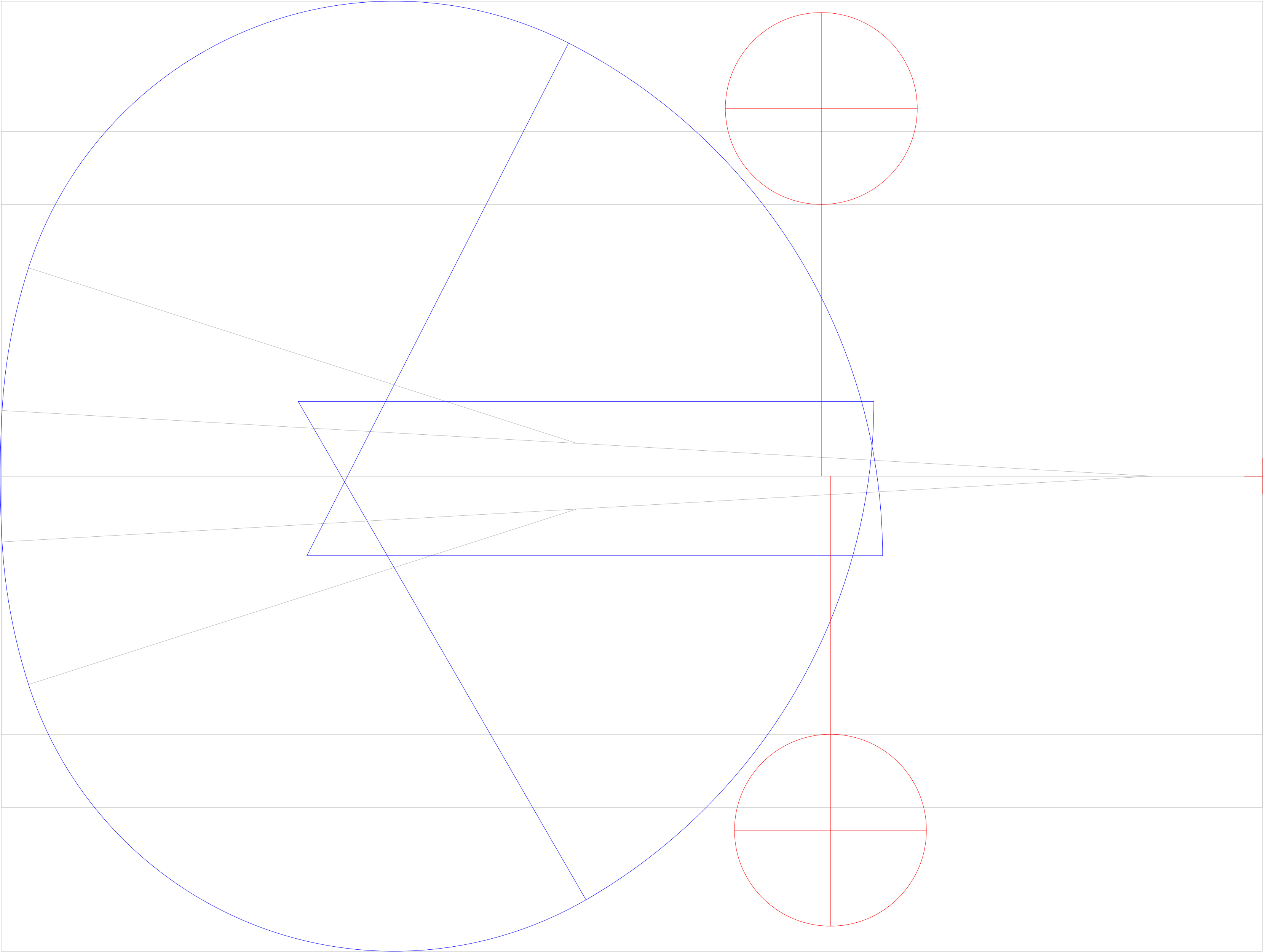
Diameter = 2.625

offset 1/8th

Center = (-6.03125, 5.03125)

Center = (-5.90625, -4.84375)

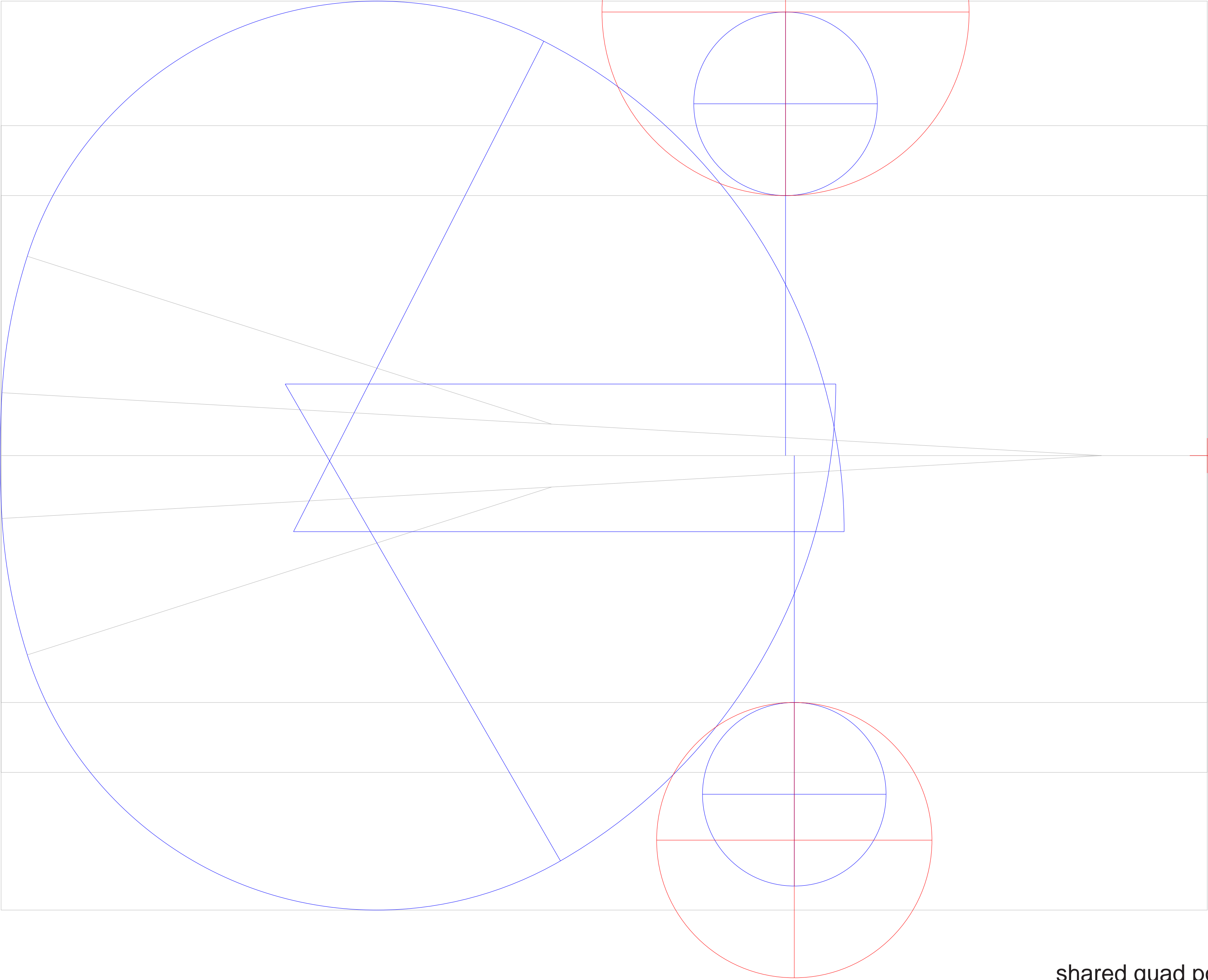
Radius	
3/32 B	
1/8 B	
3/16 B	
1/4 B	
3/8 B	
1/2 B	1.3125
3/4 B	
Base	2.625
1.5 B	
2 B	5.25
3 B	7.875
4 B	
6 B	15.75



Diameter = 5.25
Center = (-6.03125, 6.34375)

shared quad point
(-6.03125, 3.71875)

Radius	
3/32 B	
1/8 B	
3/16 B	
1/4 B	
3/8 B	
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	
2 B	5.25
3 B	7.875
4 B	
6 B	15.75



Diameter = 3.9375
Center = (-5.90625, -5.5)

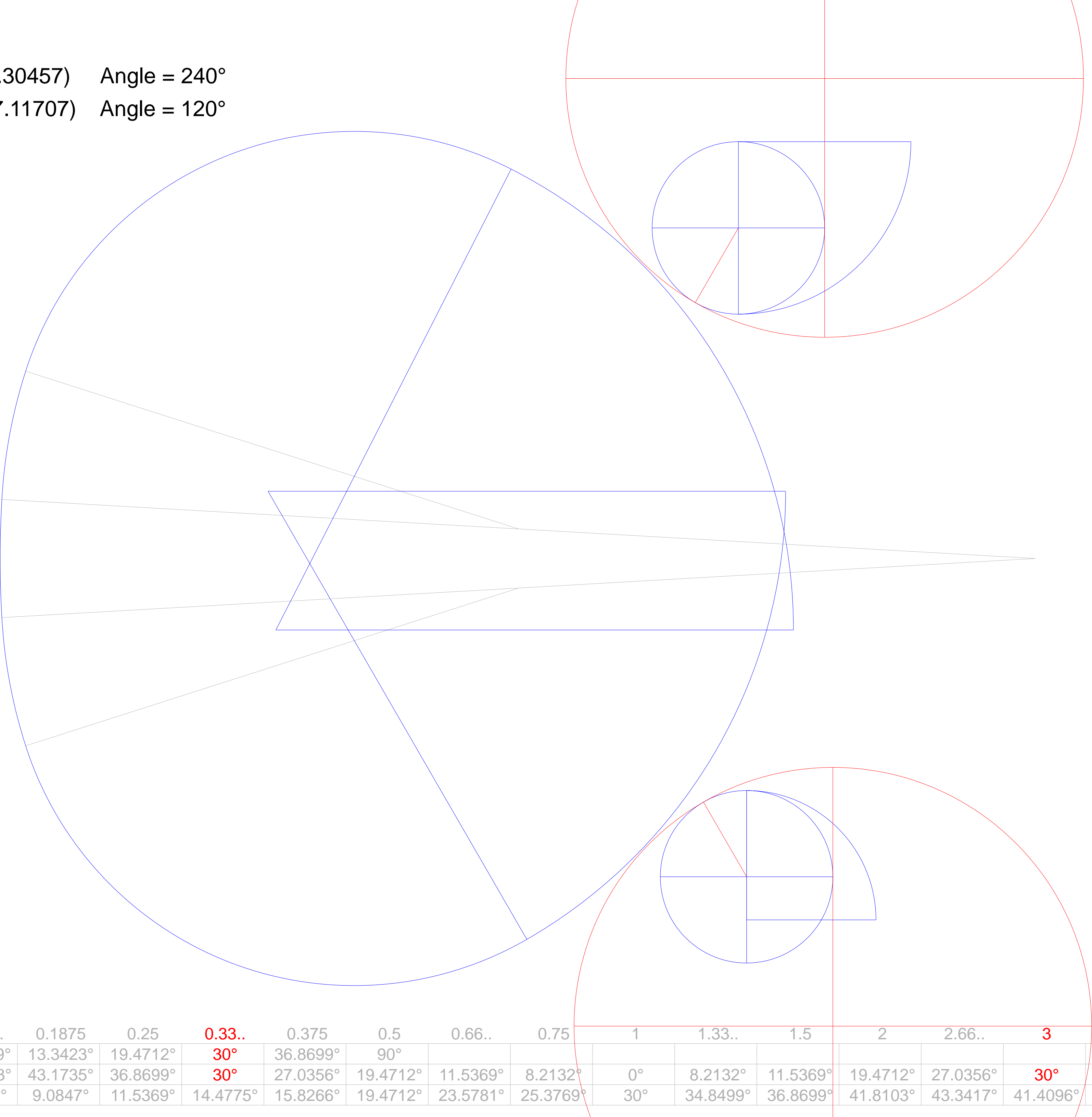
shared quad point
(-5.90625, -3.53125)

Diameter = 7.875
Center = (-4.71875, 7.30457) Angle = 240°
Center = (-4.59375, -7.11707) Angle = 120°

- Radius
- 3/32 B
 - 1/8 B
 - 3/16 B
 - 1/4 B
 - 3/8 B
 - 1/2 B 1.3125**
 - 3/4 B 1.96875
 - Base 2.625
 - 1.5 B 3.9375**
 - 2 B 5.25
 - 3 B 7.875
 - 4 B
 - 6 B 15.75

n / p = 3
p / n = 0.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 10.5

Center = (-5.25, 1.0625)

now working backwards from the neck

right quad point set: $(0, 1.0625)$

Radius

3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

3 B 7.875

4 B

6 B 15.75

Diameter = 7.875
Center = (-3.98725, 1.42045)
Angle = 15.8266°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B

Base 2.625

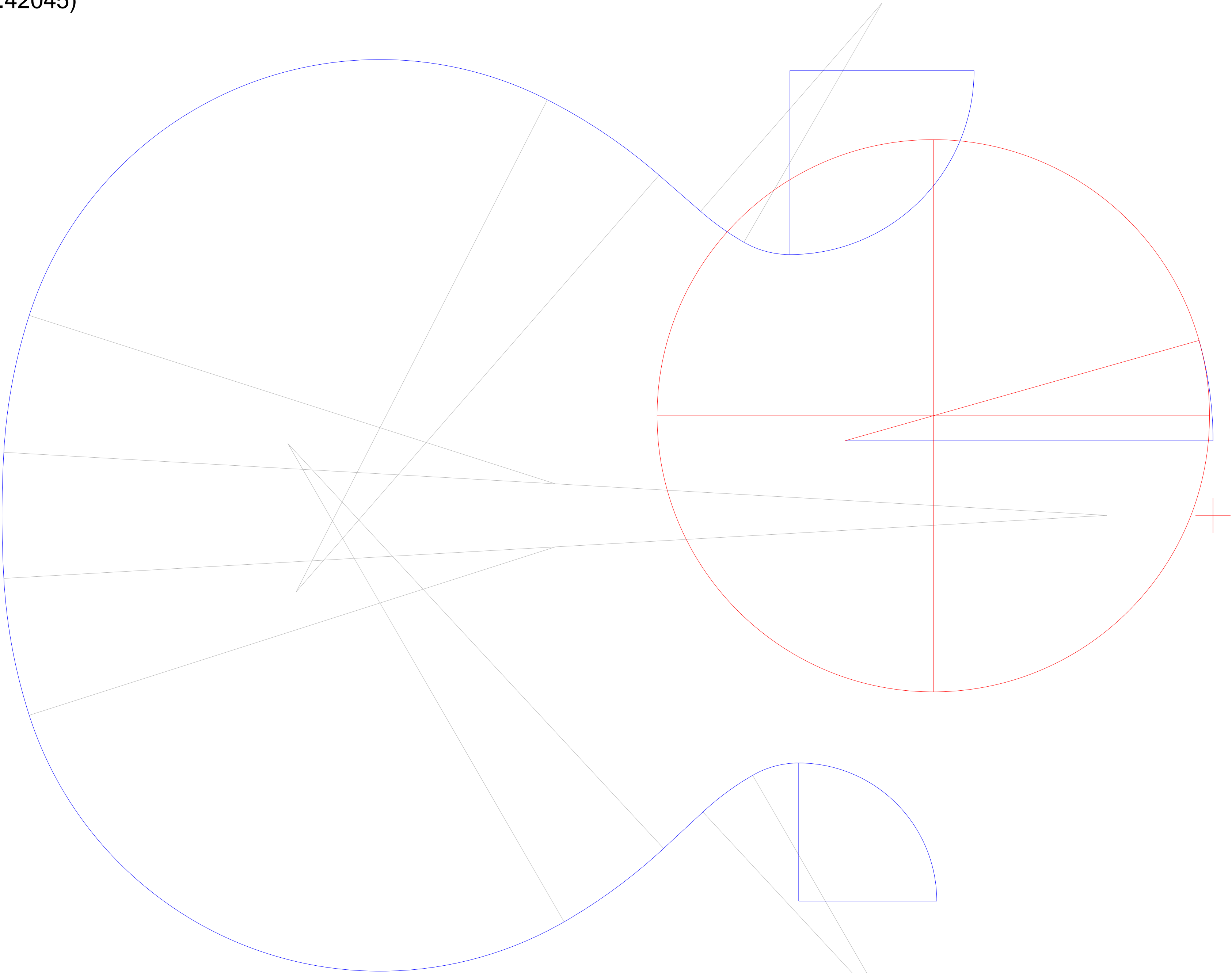
1.5 B 3.9375

2 B 5.25

3 B 7.875

4 B

6 B 15.75



n / p = 0.75 1/2
p / n = 1.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 5.25
Center = (-2.88199, 2.1283)
Angle = 32.637°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B

Base 2.625

1.5 B 3.9375

2 B 5.25

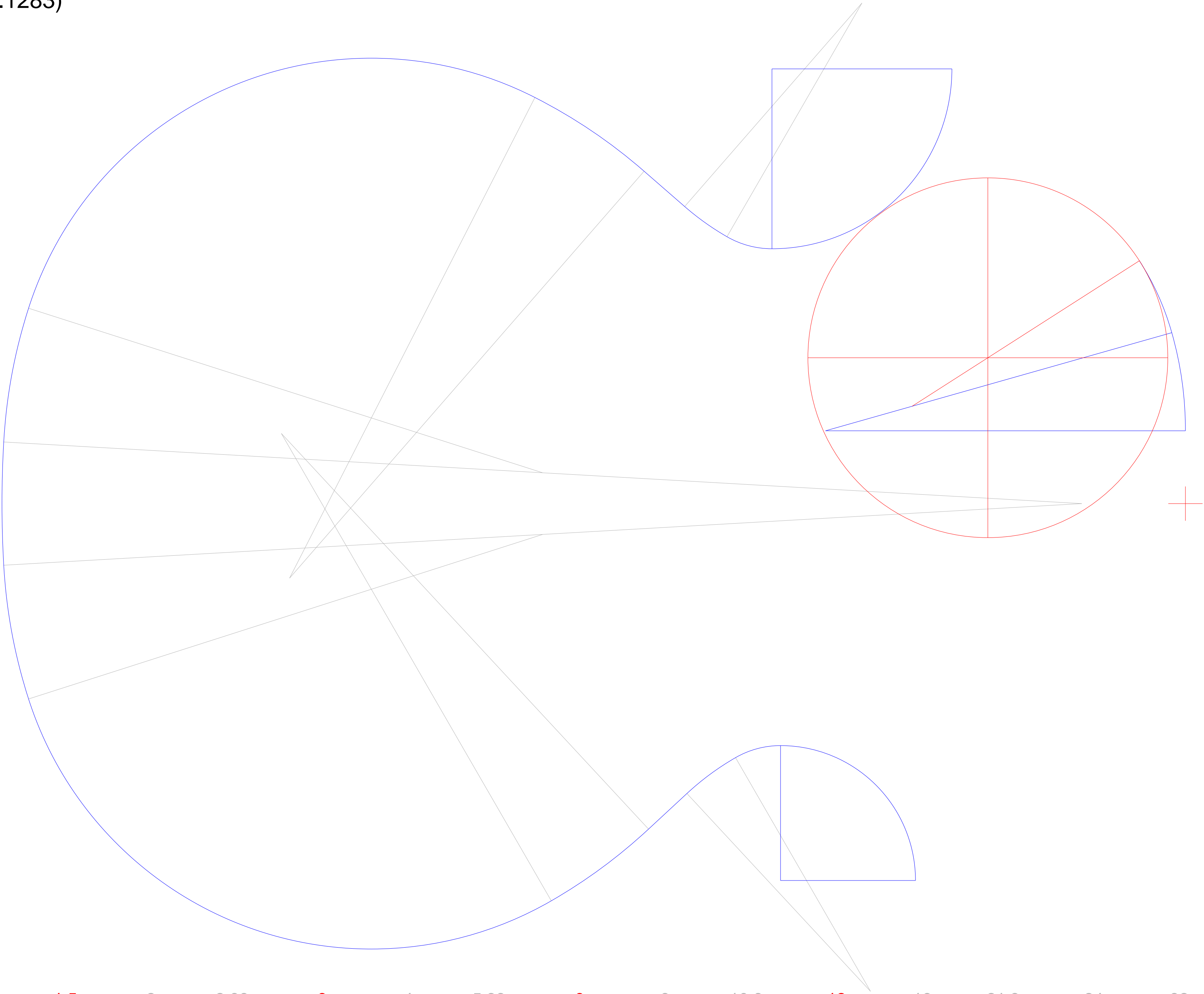
3 B 7.875

4 B

6 B 15.75

n / p = 0.66..
p / n = 1.5 *8

ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°



Diameter = 3.9375
Center = (-2.60074, 2.72123)
Angle = 64.623°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

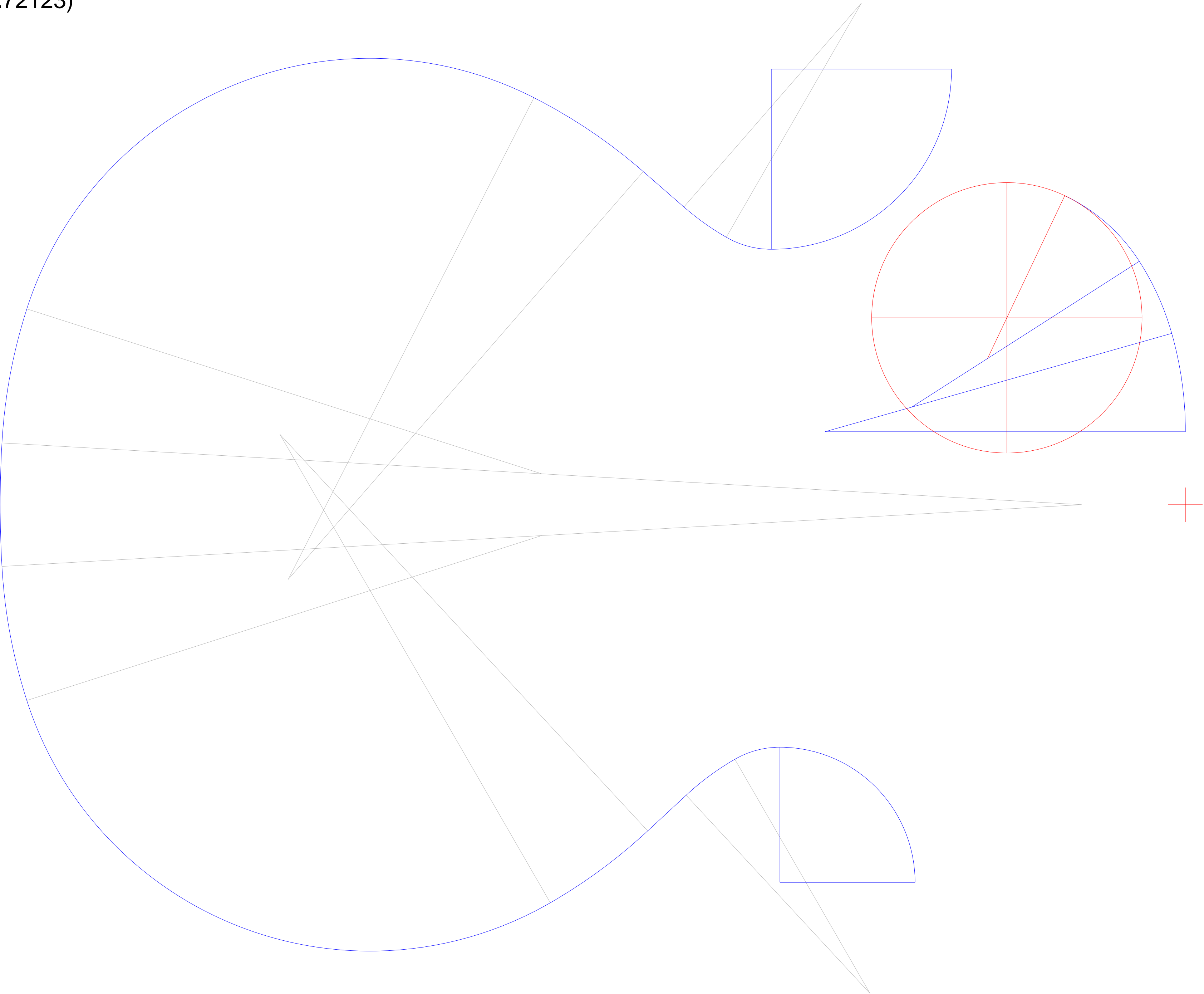
3 B 7.875

4 B

6 B 15.75

n / p = 0.75
p / n = 1.33..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°		8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°		41.4096°	36.8699°

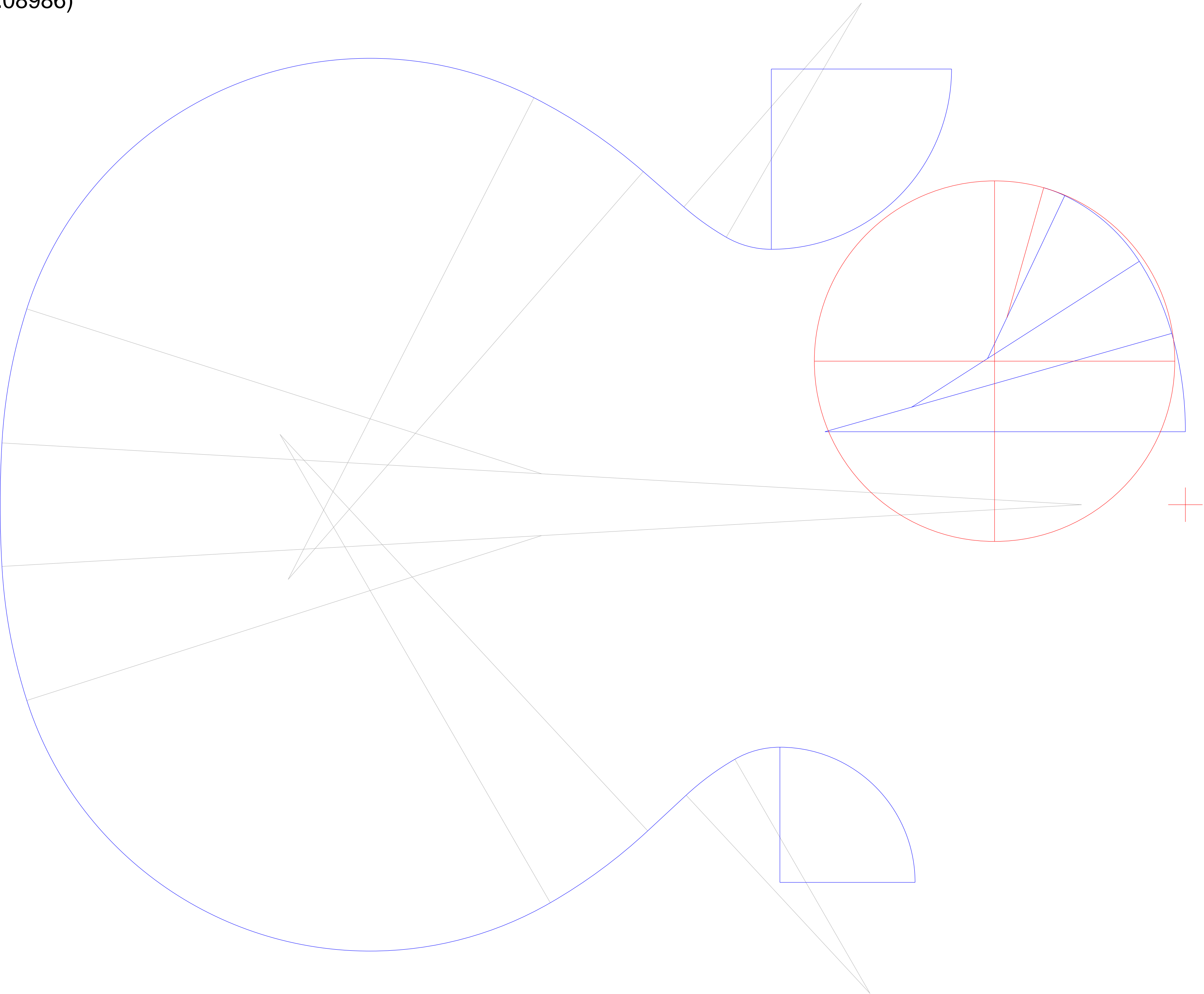


Diameter = 5.25
Center = (-2.77972, 2.08986)
Angle = 74.1733°

Radius	
3/32 B	
1/8 B	
3/16 B	
1/4 B	
3/8 B	
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	
6 B	15.75

n / p = 1.33..
p / n = 0.75 1/2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°		8.2132°		8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 15.75
Center = (-0.679717, -2.72185)
Angle = 113.5781°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

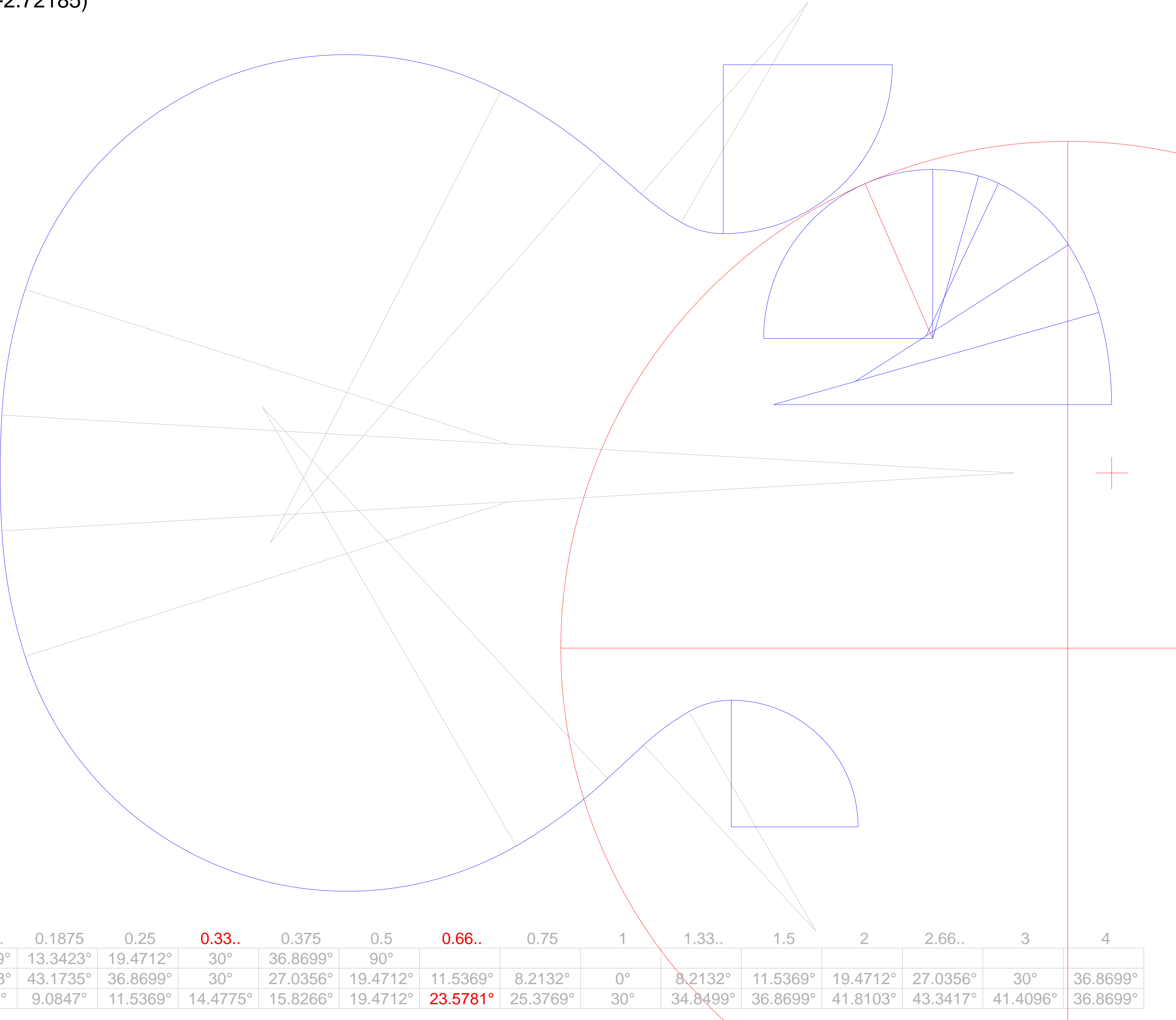
3 B 7.875

4 B

6 B 15.75

n / p = 3
p / n = 0.33.. *2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

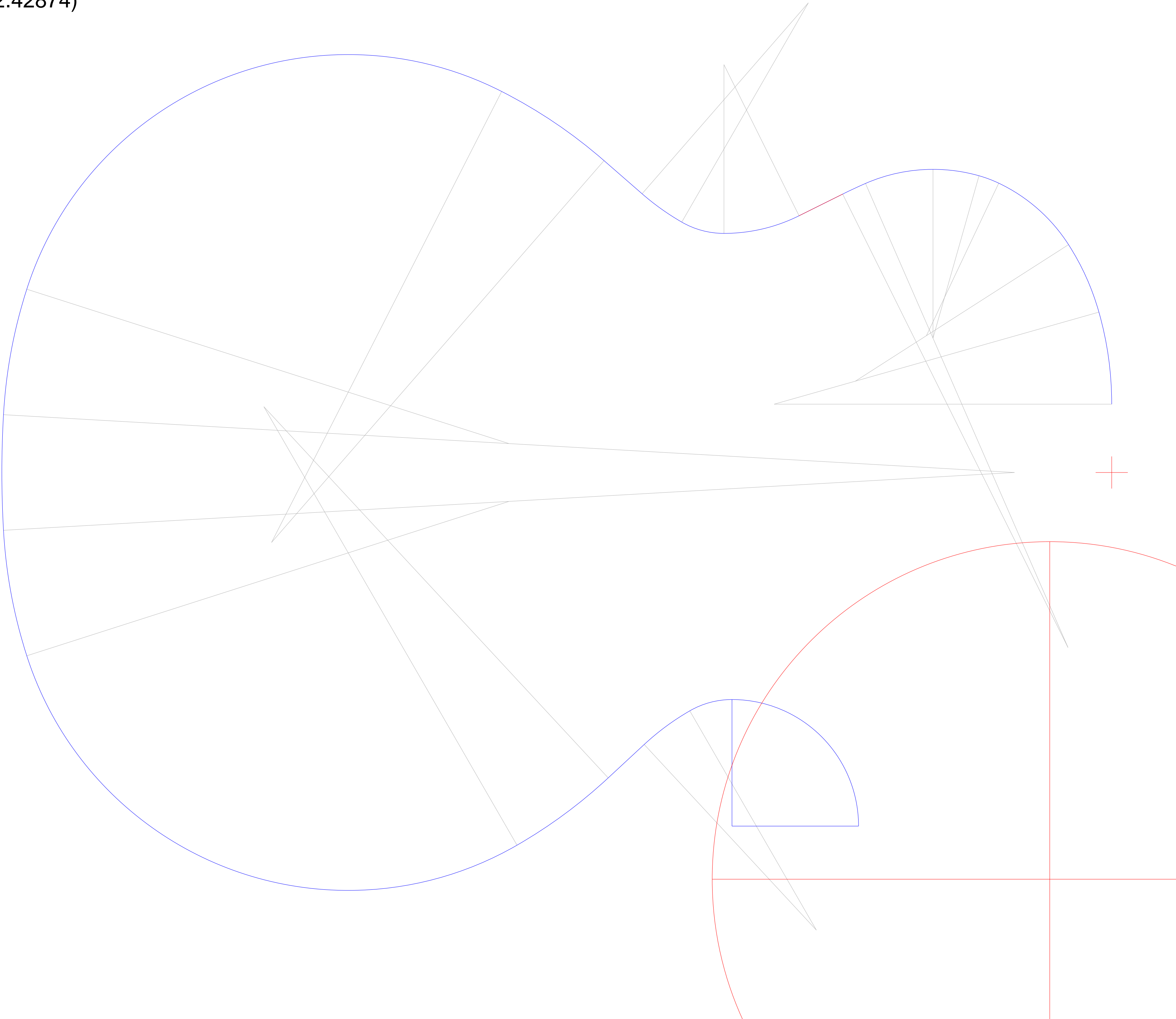


Diameter = 10.5

Center = (-1.52631, -2.42874)

set tangent to neck taper

Radius	
3/32 B	
1/8 B	
3/16 B	
1/4 B	
3/8 B	
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	
6 B	15.75



Diameter = 2.625
Center = (-1.52631, -2.42874)
Angle = 98.2132°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

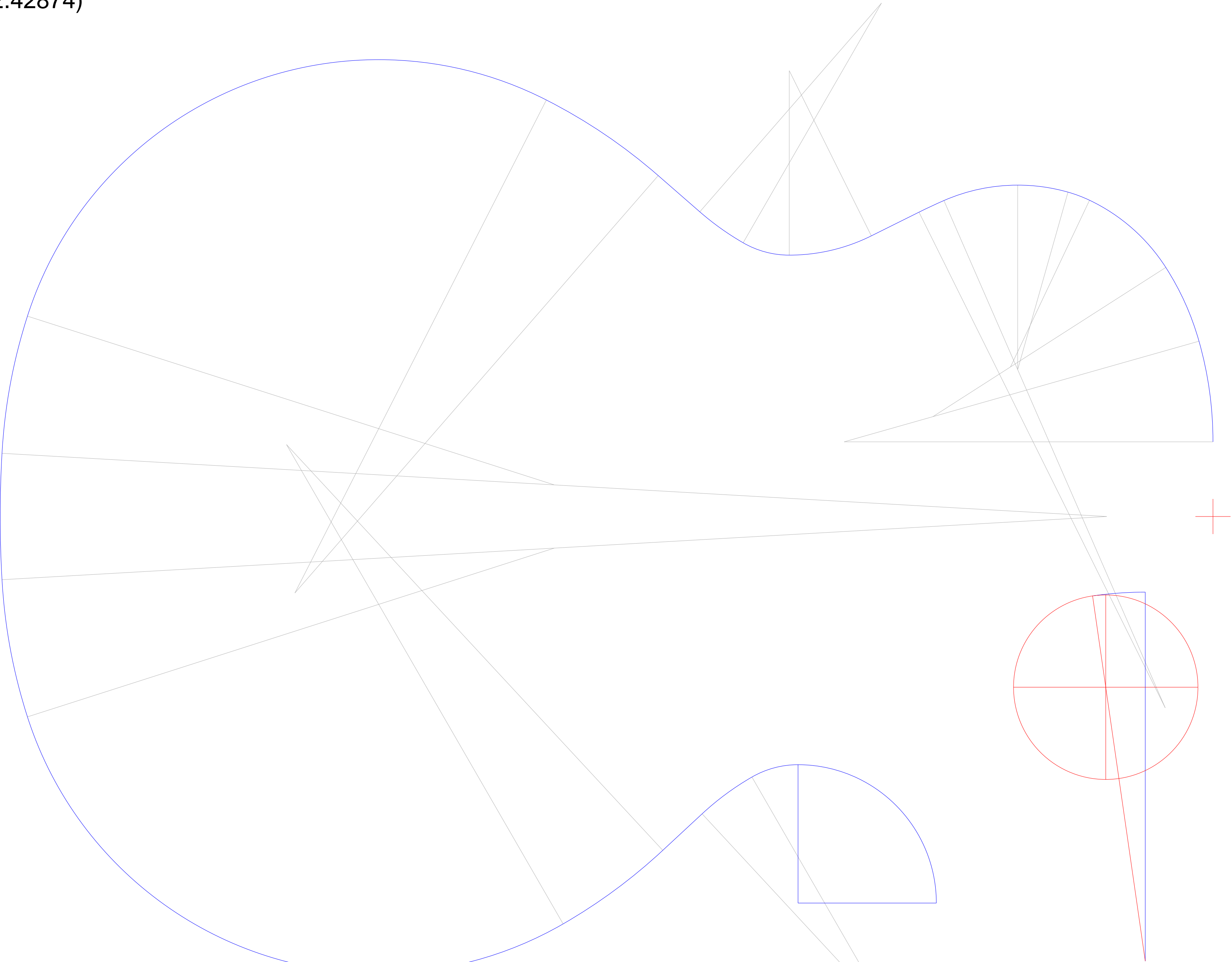
3 B 7.875

4 B

6 B 15.75

n / p = 0.25 1/2
p / n = 4

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 3.9375
Center = (-1.03412, -1.99467)
Angle = 221.4096°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

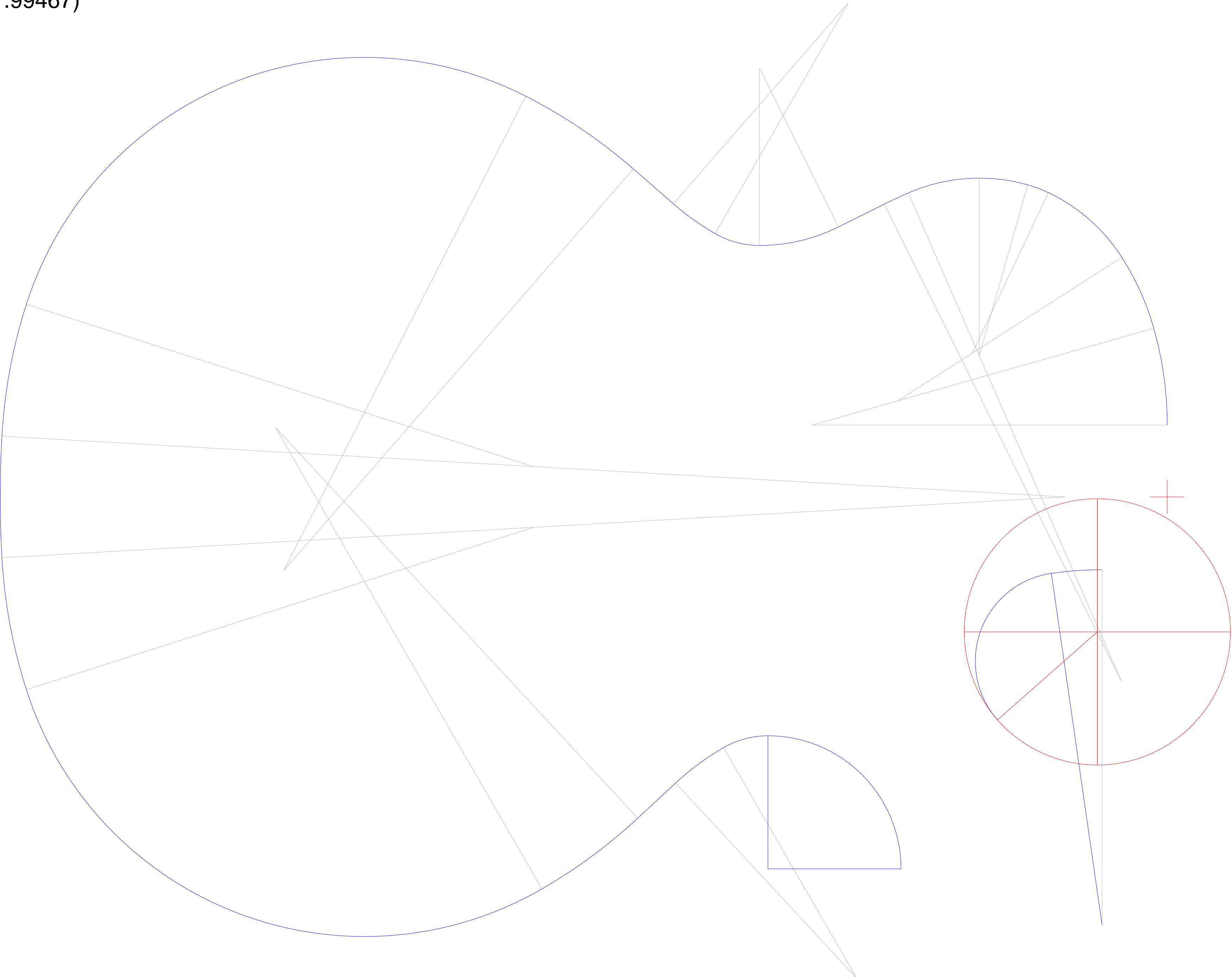
3 B 7.875

4 B

6 B 15.75

n / p = 1.5 *2
p / n = 0.66..

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 7.875
Center = (0.203314, -0.463417)
Angle = 231.0575°

- Radius
- 3/32 B

1/8 B

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

3 B 7.875

4 B

6 B 15.75

n

/

p

=

2

*

4

p

/

n

=

0.5

1/4

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°

Diameter = 0.65625
Center = (-2.07, -4.07279)
Angle = 237.7957°

- Radius
- 3/32 B

1/8 B 0.328125

3/16 B

1/4 B

3/8 B

1/2 B 1.3125

3/4 B 1.96875

Base 2.625

1.5 B 3.9375

2 B 5.25

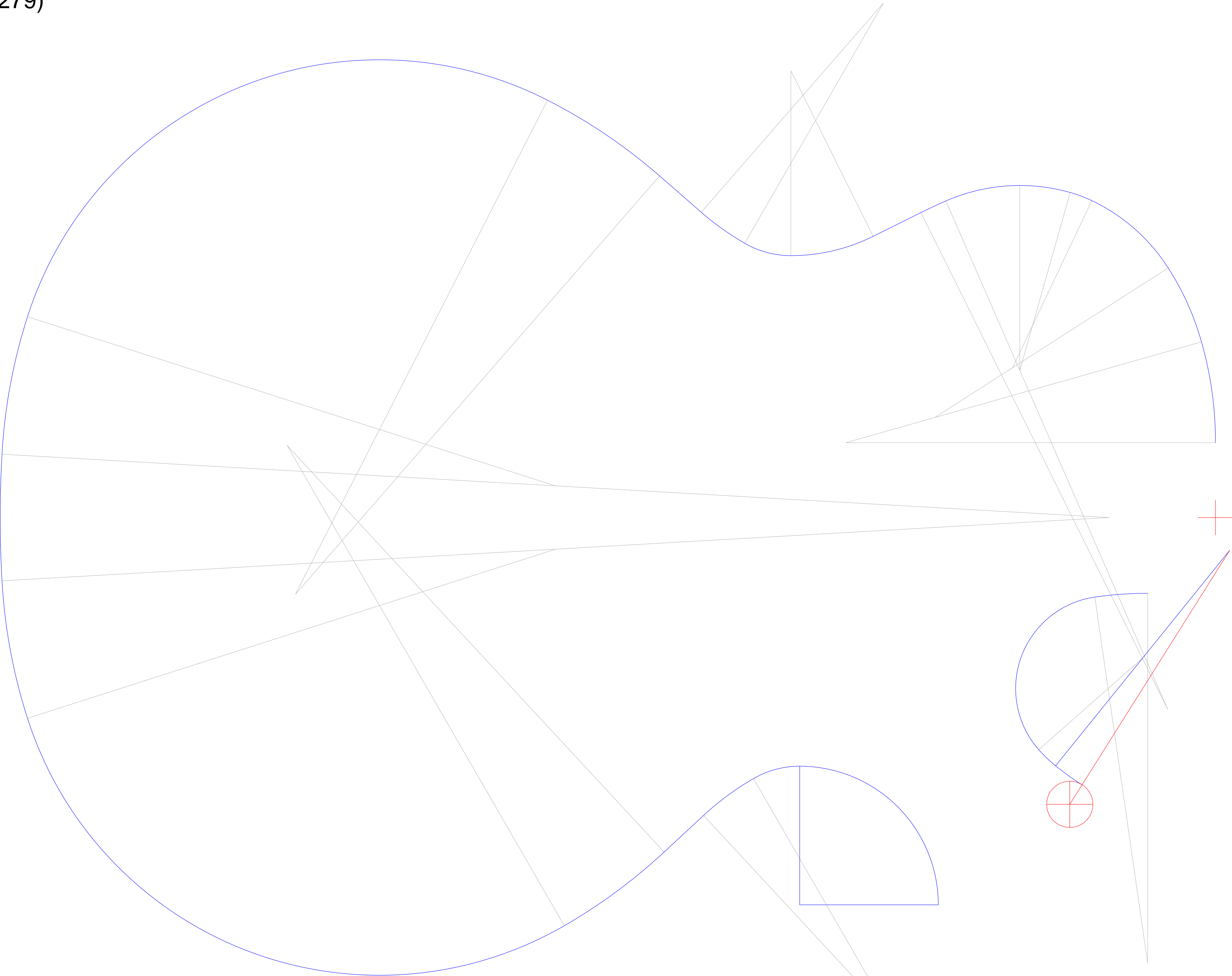
3 B 7.875

4 B

6 B 15.75

n / p = 0.0833..
p / n = 12

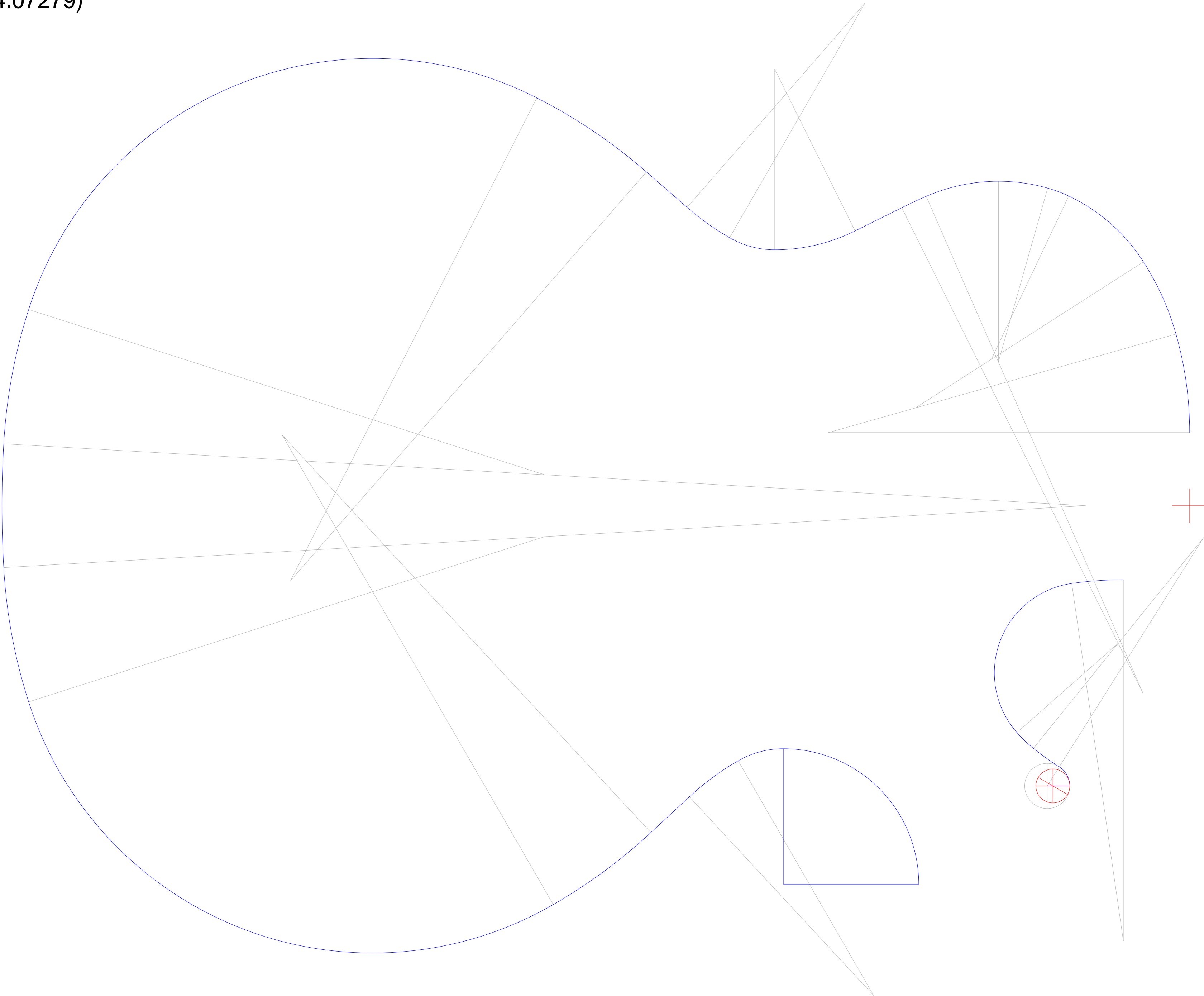
ratio	1	1.33..	1.5	2	2.66..	3	4	5.33..	6	8	10.6..	12	16	21.3..	24	32
inside																
edge	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°	43.1735°	44.4153°	38.9424°	34.0477°	32.2042°	28.0724°	24.4327°	23.0739°	20.0499°
quad	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°	32.6369°	31.0027°	27.2660°	23.8955°	22.6198°	19.7499°	17.2105°	16.2602°	14.1411°



Diameter = 0.4921875
Center = (-1.98797, -4.07279)

shared quad point

Radius	
3/32 B	0.24609375
1/8 B	0.328125
3/16 B	
1/4 B	
3/8 B	
1/2 B	1.3125
3/4 B	1.96875
Base	2.625
1.5 B	3.9375
2 B	5.25
3 B	7.875
4 B	
6 B	15.75



Diameter = 0.984375
Center = (-2.20109, -3.94975)
Angle = 330°

- Radius
- 3/32 B

0.24609375
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B
- 3/8 B
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

3.9375
- 2 B

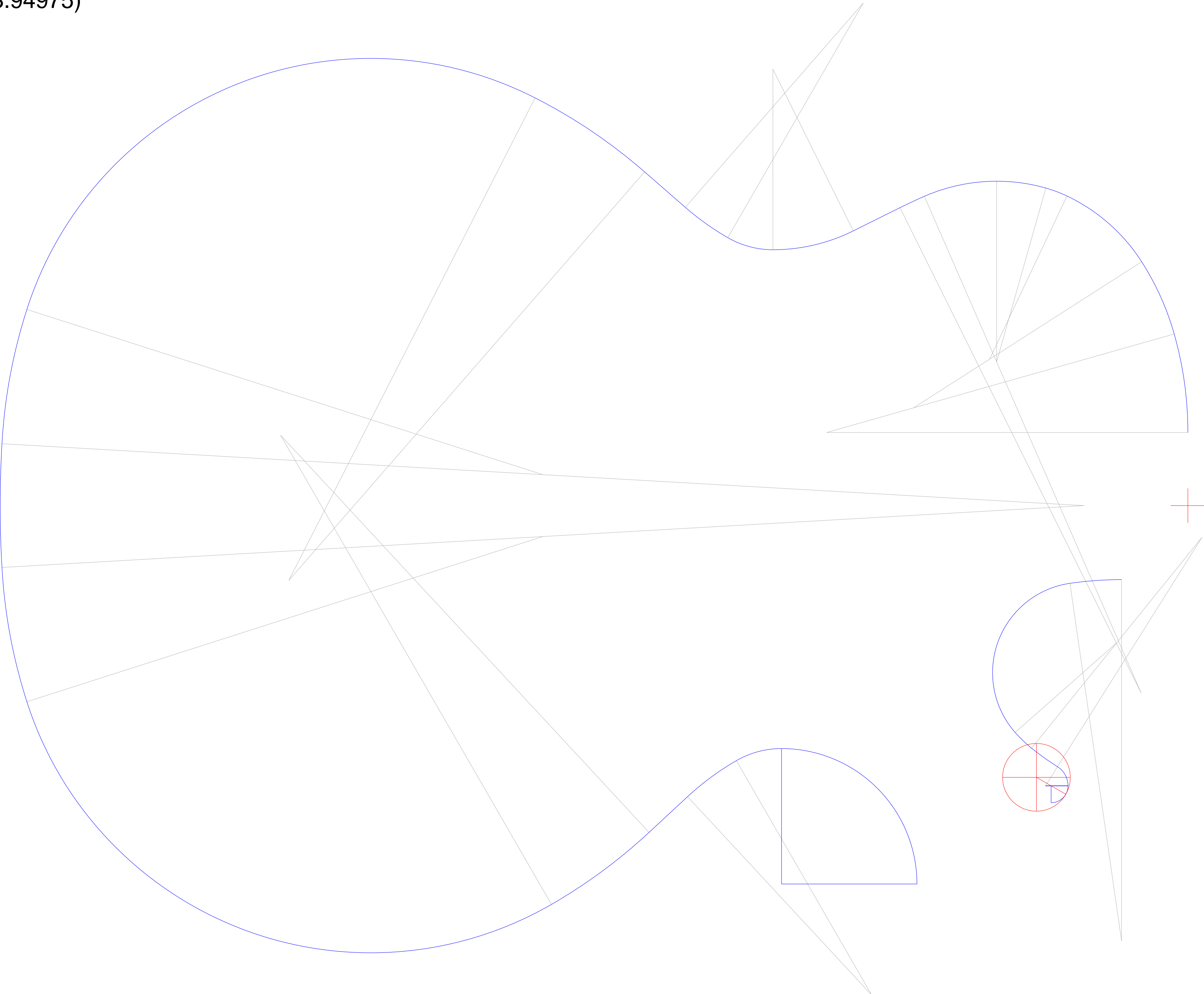
5.25
- 3 B

7.875
- 4 B
- 6 B

15.75

n / p = 2 1/2
p / n = 0.5 *2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 1.96875
Center = (-2.49641, -3.556)
Angle = 306.8698°

- Radius
- 3/32 B

0.24609375
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

3.9375
- 2 B

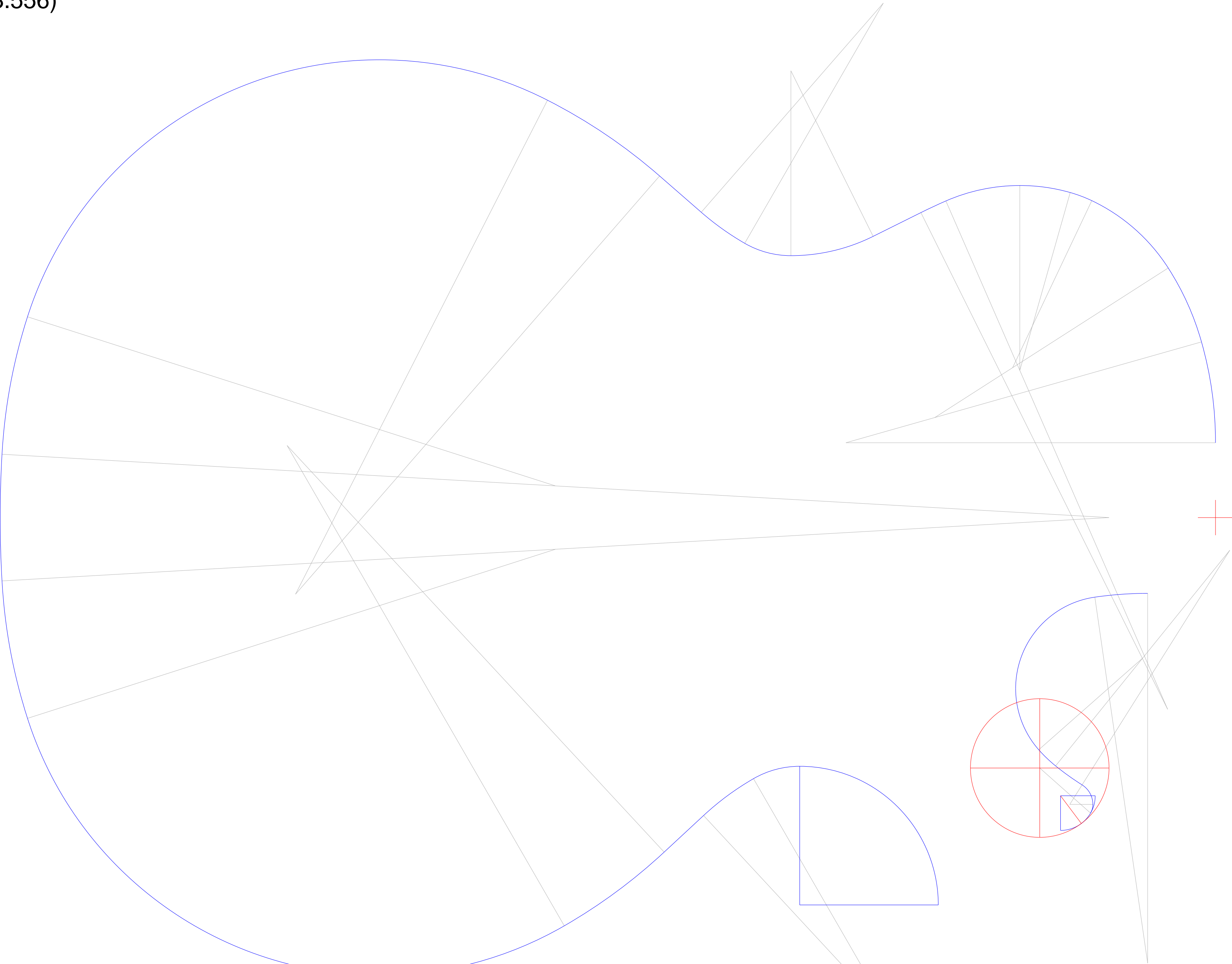
5.25
- 3 B

7.875
- 4 B
- 6 B

15.75

n / p = 2 *2
p / n = 0.5 1/2

ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°



Diameter = 5.25
Center = (-2.66613, -1.92417)
Angle = 275.9377°

- Radius
- 3/32 B

0.24609375
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

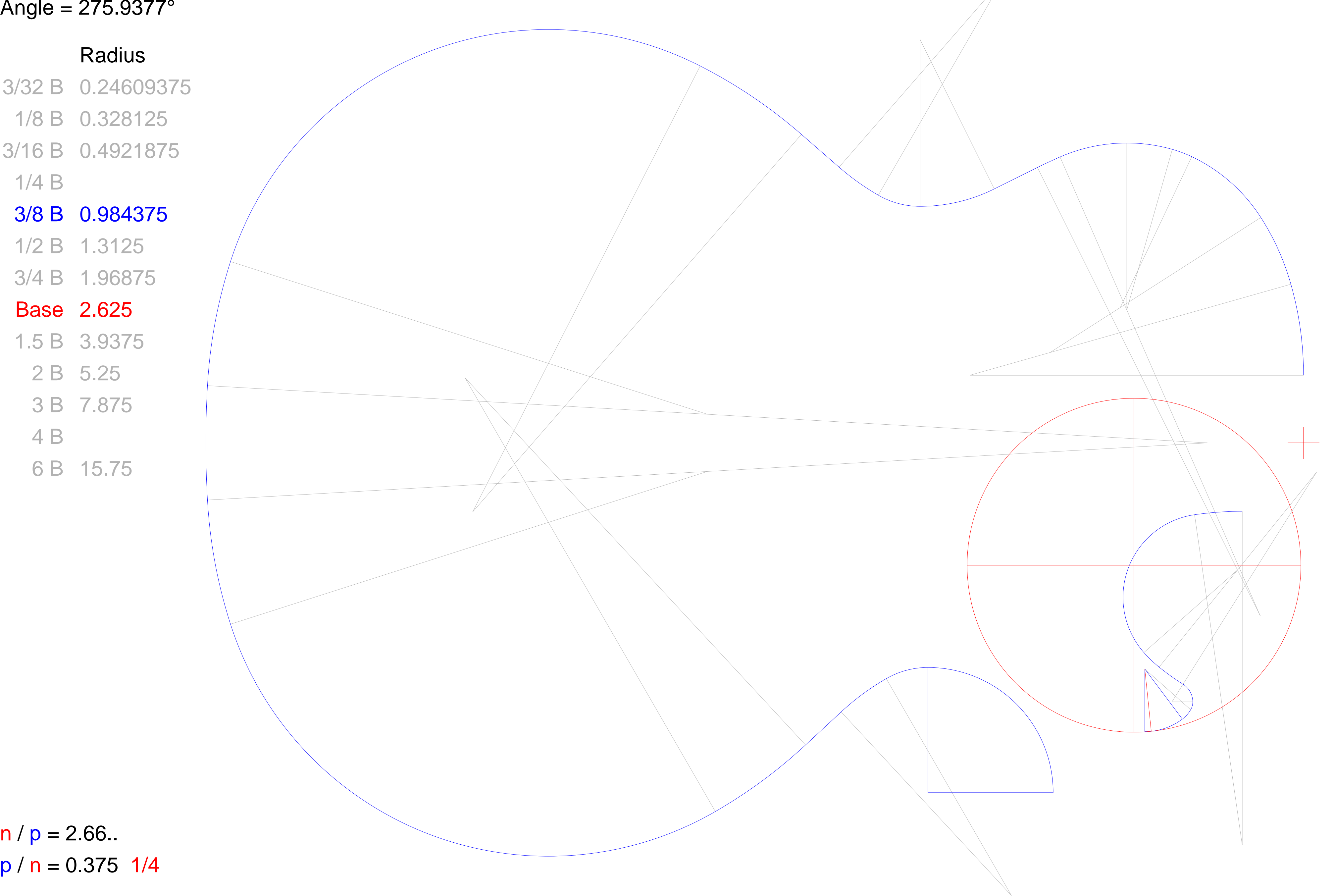
3.9375
- 2 B

5.25
- 3 B

7.875
- 4 B
- 6 B

15.75

n / p = 2.66..
p / n = 0.375 1/4



Diameter = 7.875
Center = (-2.40363, -0.638191)
Angle = 258.4630°

- Radius
- 3/32 B

0.24609375
- 1/8 B

0.328125
- 3/16 B

0.4921875
- 1/4 B
- 3/8 B

0.984375
- 1/2 B

1.3125
- 3/4 B

1.96875
- Base

2.625
- 1.5 B

3.9375
- 2 B

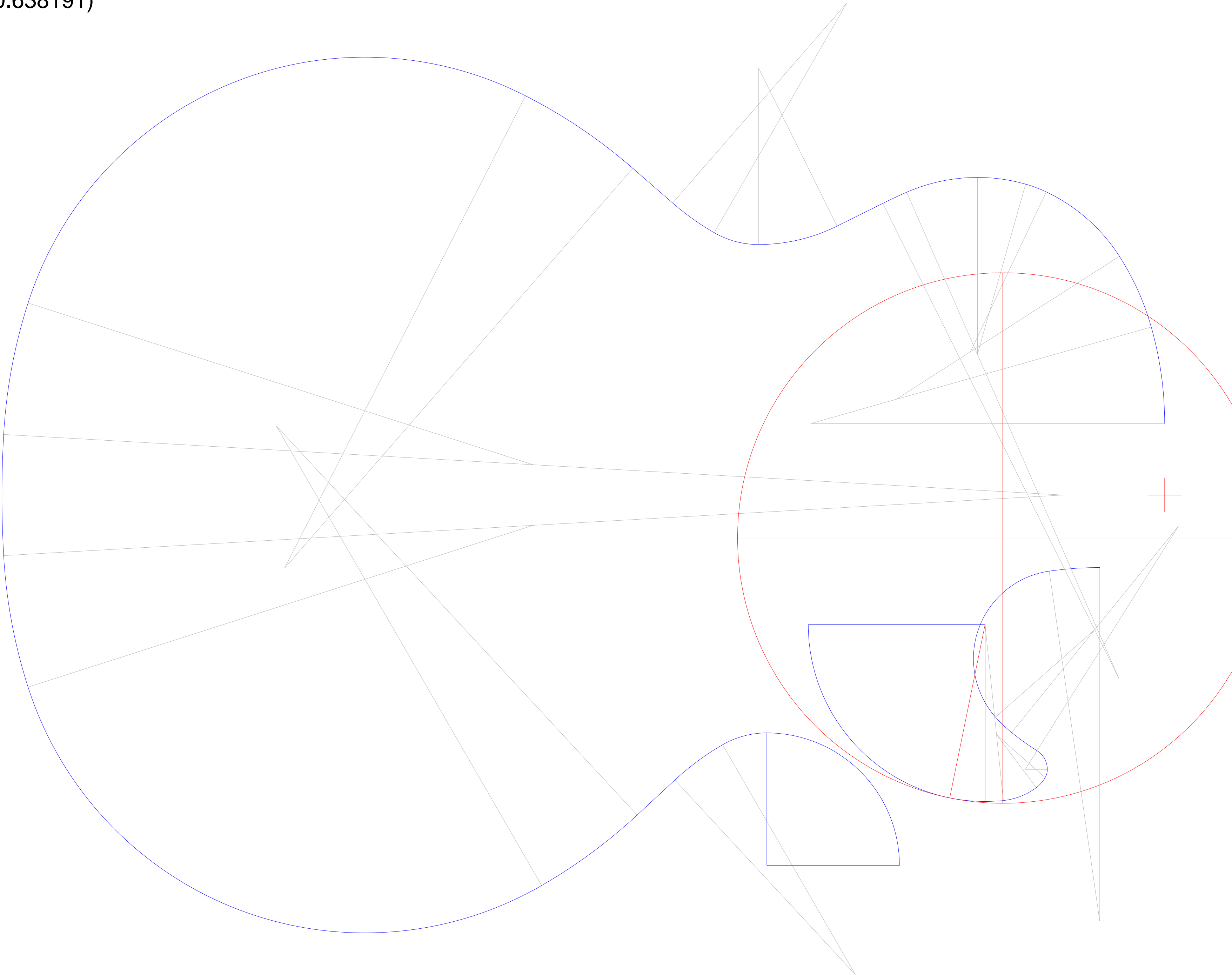
5.25
- 3 B

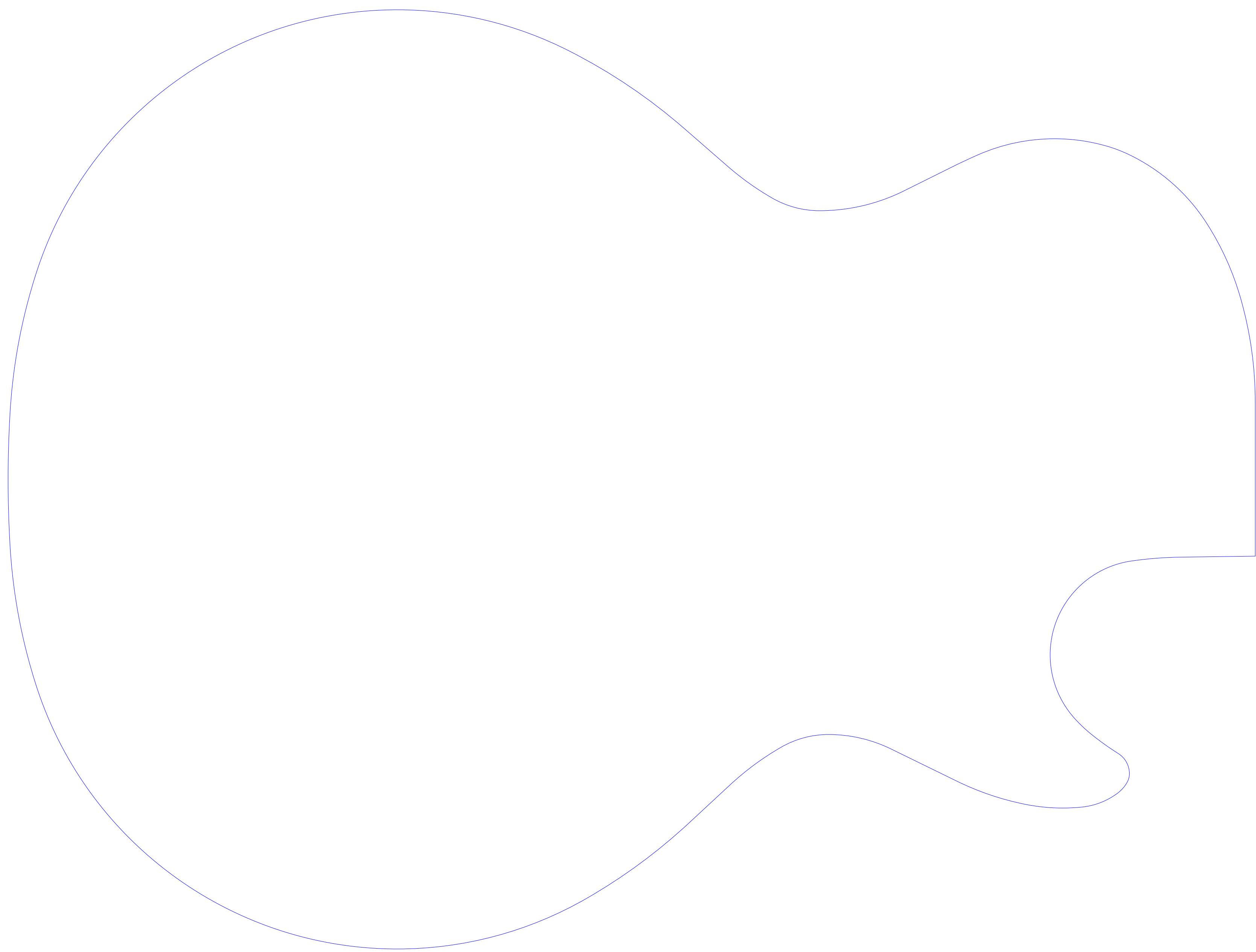
7.875
- 4 B
- 6 B

15.75

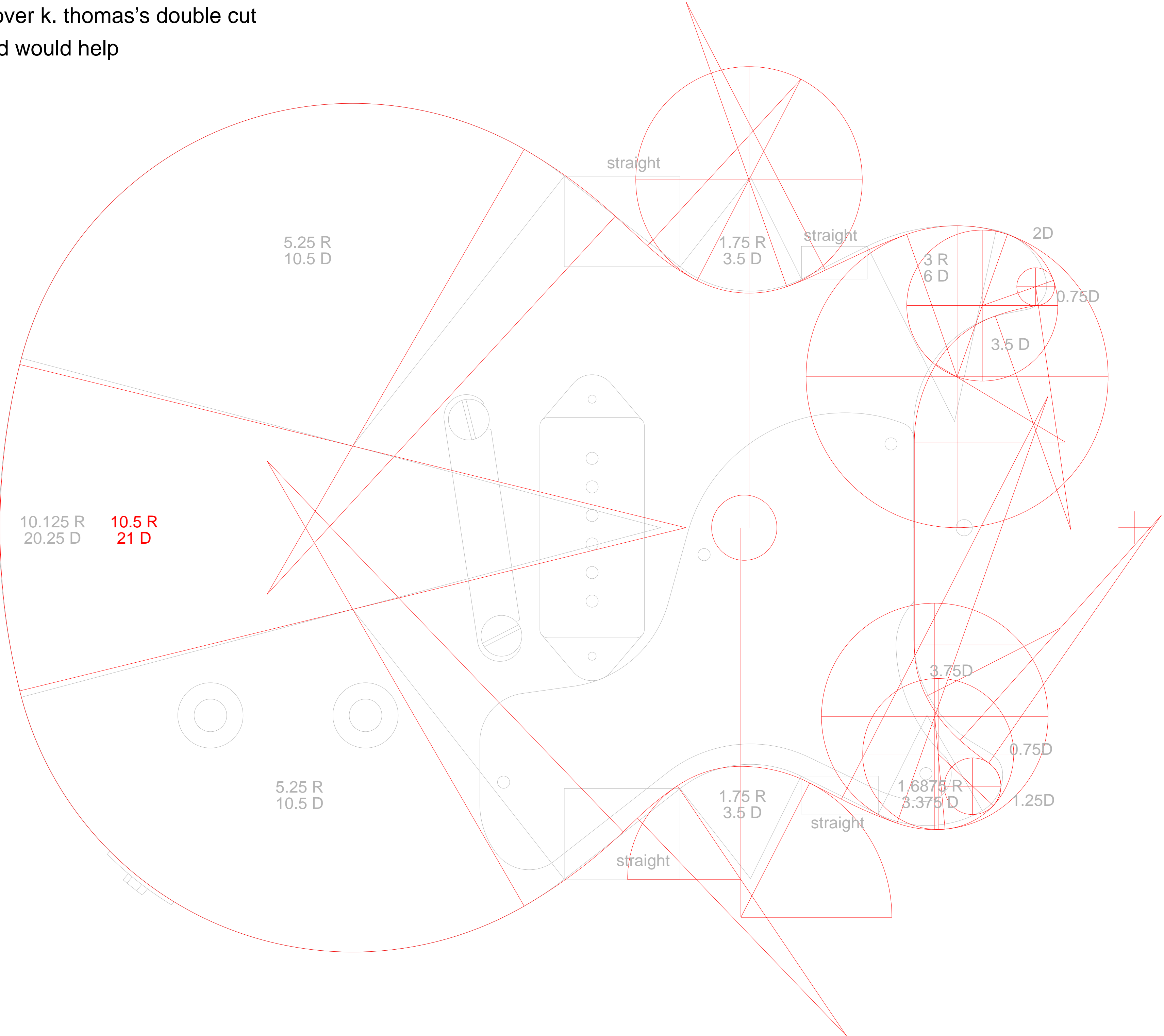
n / p = 1.5
p / n = 0.66..

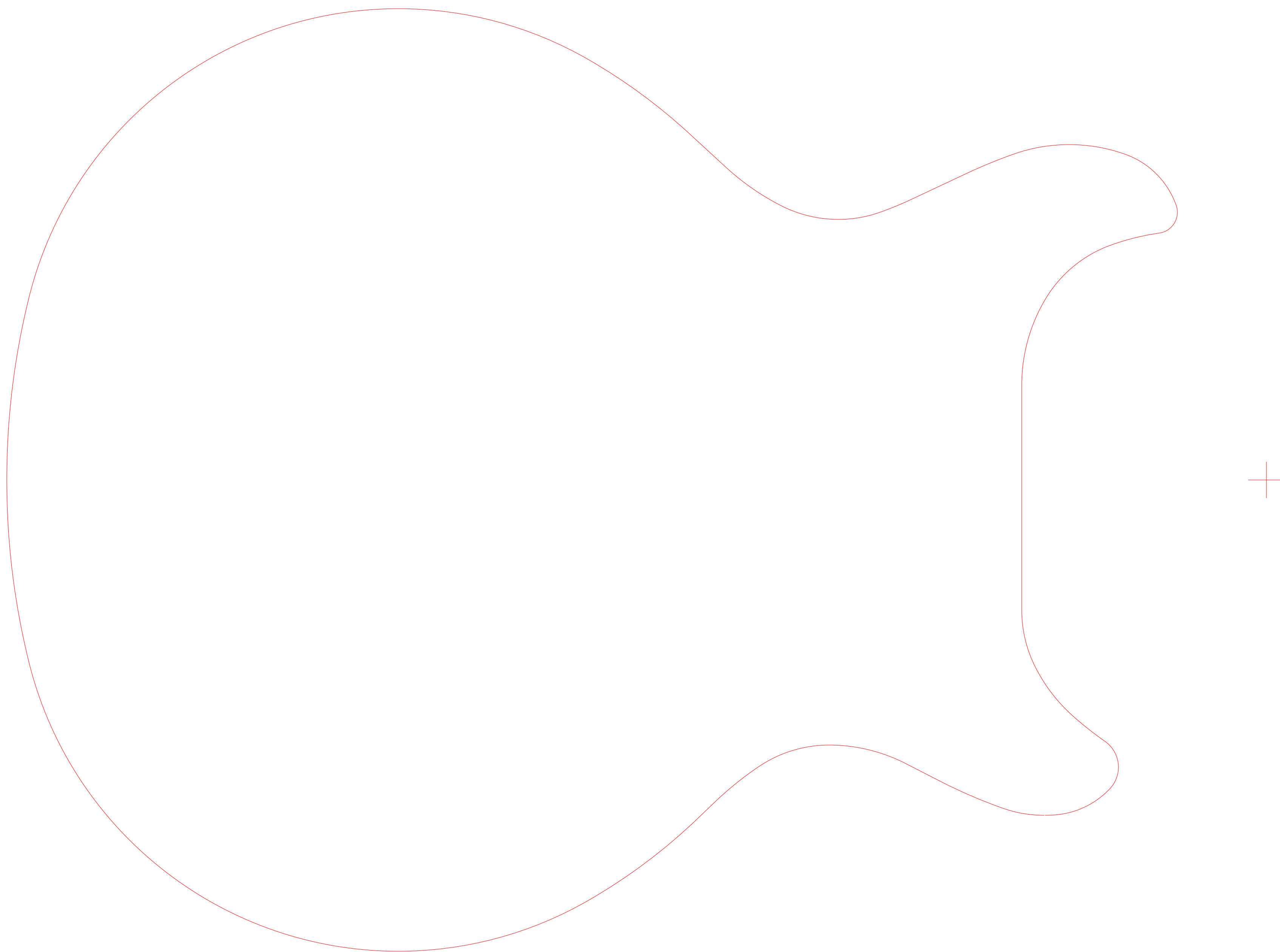
ratio	0.125	0.166..	0.1875	0.25	0.33..	0.375	0.5	0.66..	0.75	1	1.33..	1.5	2	2.66..	3	4
inside	8.2132°	11.5369°	13.3423°	19.4712°	30°	36.8699°	90°									
edge	38.9424°	44.4153°	43.1735°	36.8699°	30°	27.0356°	19.4712°	11.5369°	8.2132°	0°	8.2132°	11.5369°	19.4712°	27.0356°	30°	36.8699°
quad	6.3793°	8.2132°	9.0847°	11.5369°	14.4775°	15.8266°	19.4712°	23.5781°	25.3769°	30°	34.8499°	36.8699°	41.8103°	43.3417°	41.4096°	36.8699°





redrawn as a guess over k. thomas's double cut
a scan of a pick guard would help

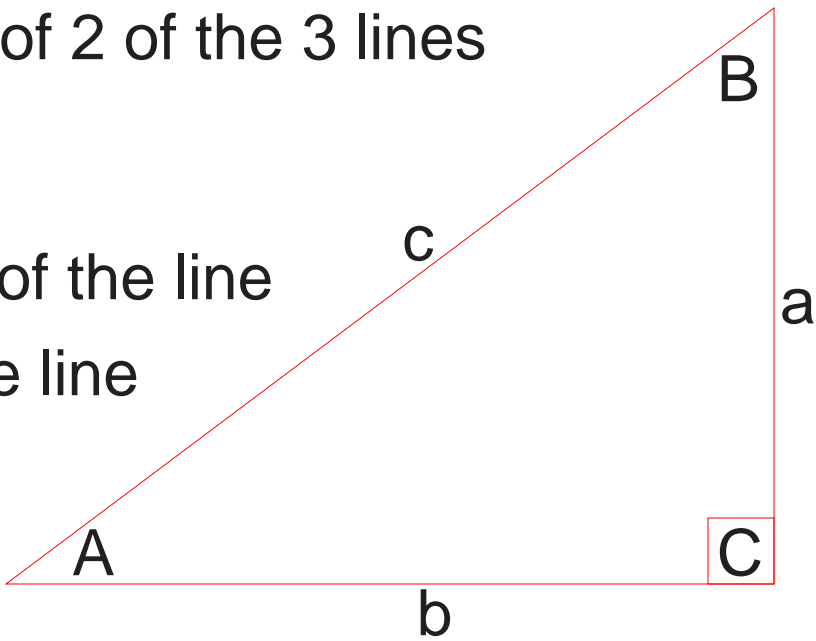




for the trig-curious:

all that's needed to calculate the angles for arcs placed in these 3 placement relationships is the lengths of 2 of the 3 lines making up a right triangle.

long form: sine of angle A = the length of the line opposite it (a) divided by the length of the line opposite the right angle (c - hypotenuse)

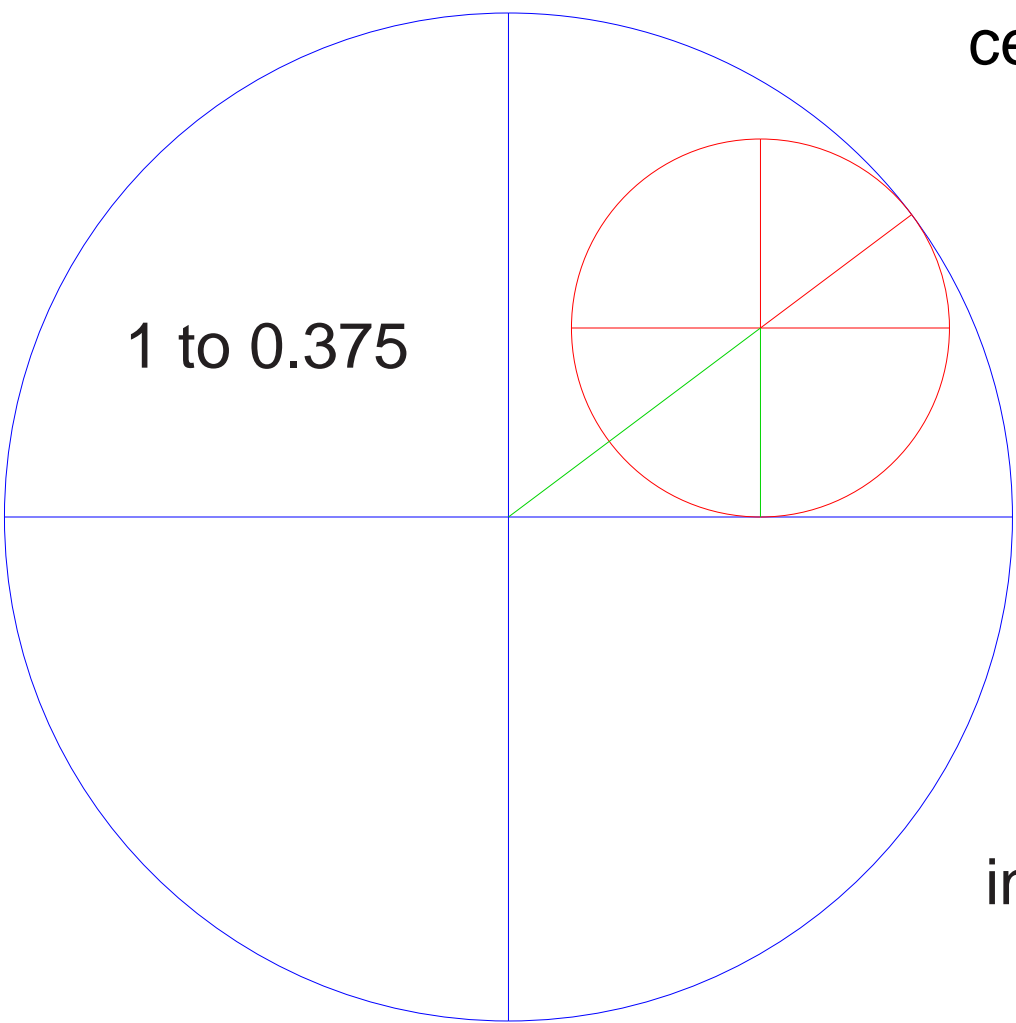


short form:

sine A = a / c = opposite side / hypotenuse sine B = b / c
cosine A = b / c = adjacent side / hypotenuse cosine B = a / c
tangent A = a / b = opposite side / adjacent side tangent B = b / a

again... the actual sizes of the circles don't matter - only the ratio of the 2. For convenience, the radius of the [previous](#) here is 1.

inside: the hypotenuse of the triangle is the [prev](#) radius less the [new](#).



center to center = $1 - 0.375 = 0.625$
side opposite A is the [new](#) radius,
the vertical difference in centers
 $\sin A = 0.375 / 0.625$
[sin A = 0.6](#)

then we need excel ...or a calculator ...or a slide rule
in excel, the formula for arc sine in degrees is: `=ASIN(0.6)*180/PI()`
“*180/PI()” converts it to degrees

windows calculator: go to menu - view - scientific. Set to dec. - deg.
arcsin, arccos and arctan are the inverse of their respective functions.
example: calculate $0.375 / 0.625$ - hit enter for 0.6, then put a check in the “inv” box and click the sine button for 36.8699 degrees.

for both of the outside tangents, the hypotenuse (center to center) will be the sum of the 2 radii

$$1 + 0.375 = 1.375$$

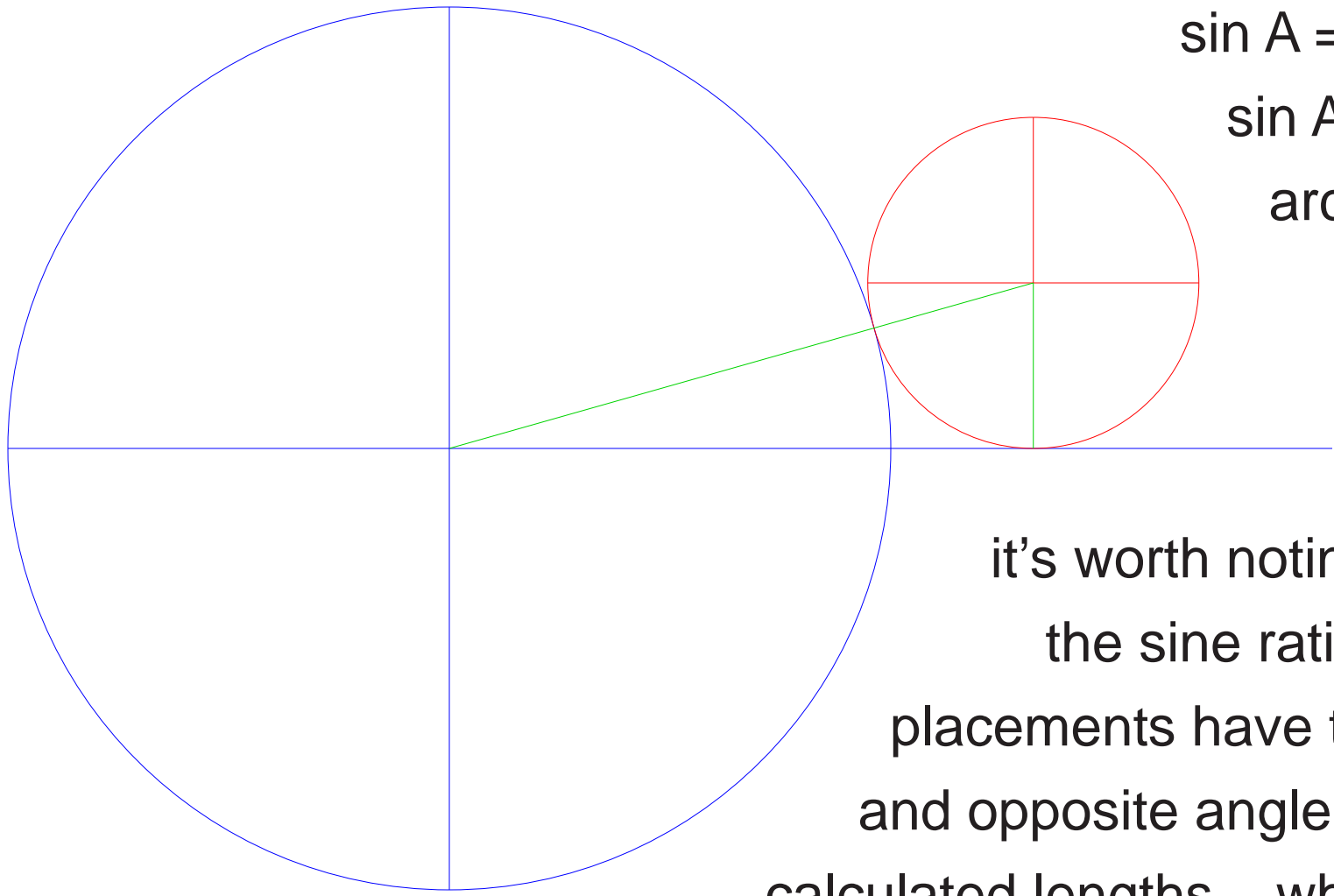
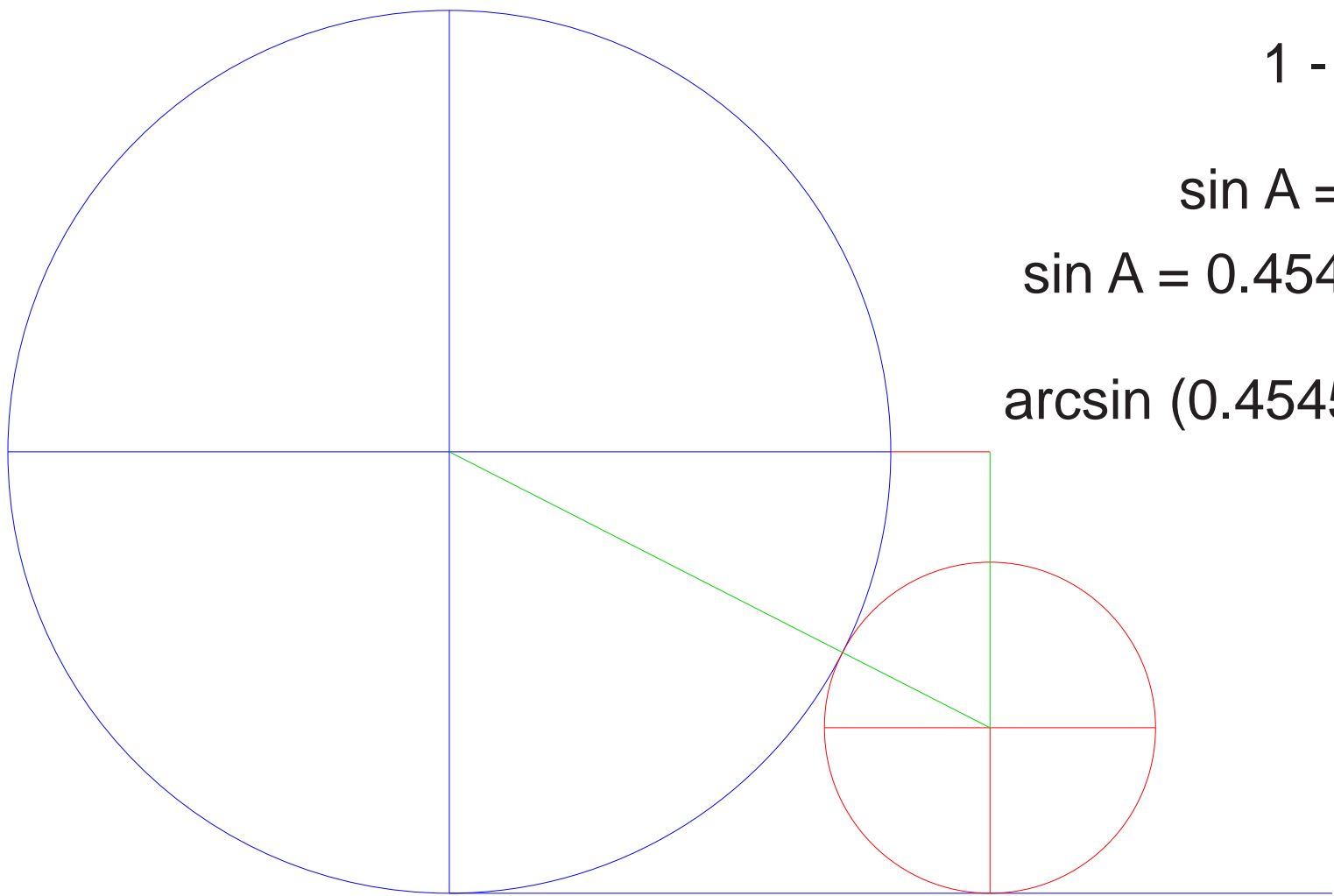
here, the side opposite the angle is the difference between the radii

$$1 - 0.375 = 0.625$$

$$\sin A = 0.625 / 1.375$$

$$\sin A = 0.45454545454545$$

$$\arcsin (0.45454545454545) = 27.03569^\circ$$



$$\sin A = 0.375 / 1.375$$

$$\sin A = 0.272727...$$

$$\arcsin (0.272727...) = 15.8266^\circ$$

it's worth noting that we used the sine ratio because all 3 placements have the hypotenuse and opposite angle sides as easily calculated lengths. where the other 2

sides are known, tangent and arctan can be used

example: length “b” back and “a” up for calculating a neck angle.
be cautious if you use arctan for neck angle... be fully aware of the pivot point and if / how rotation will shift your measured points.
when in doubt, draw it out.