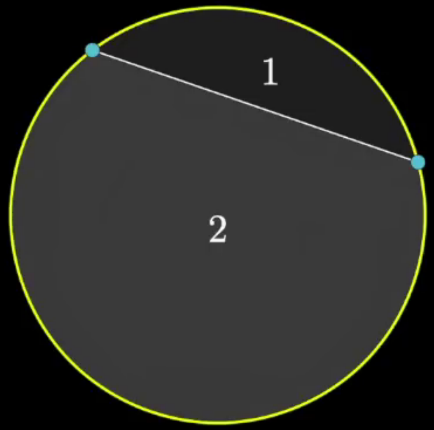
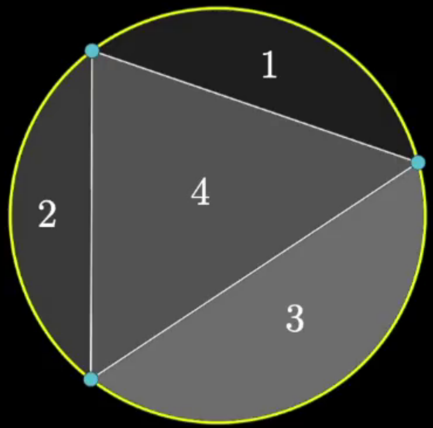
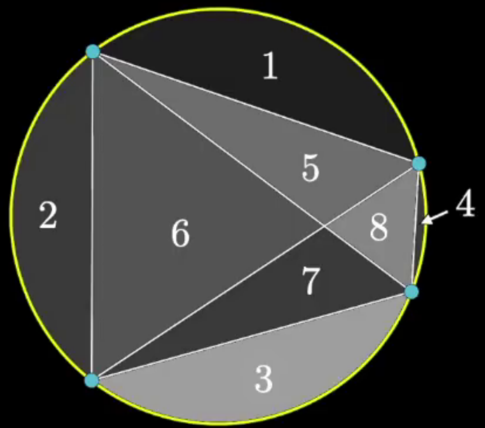
2 points
2 regions



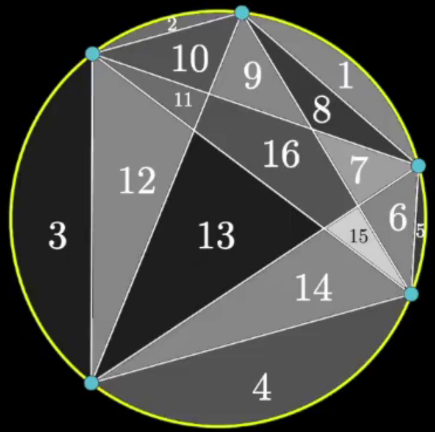
3 points
4 regions

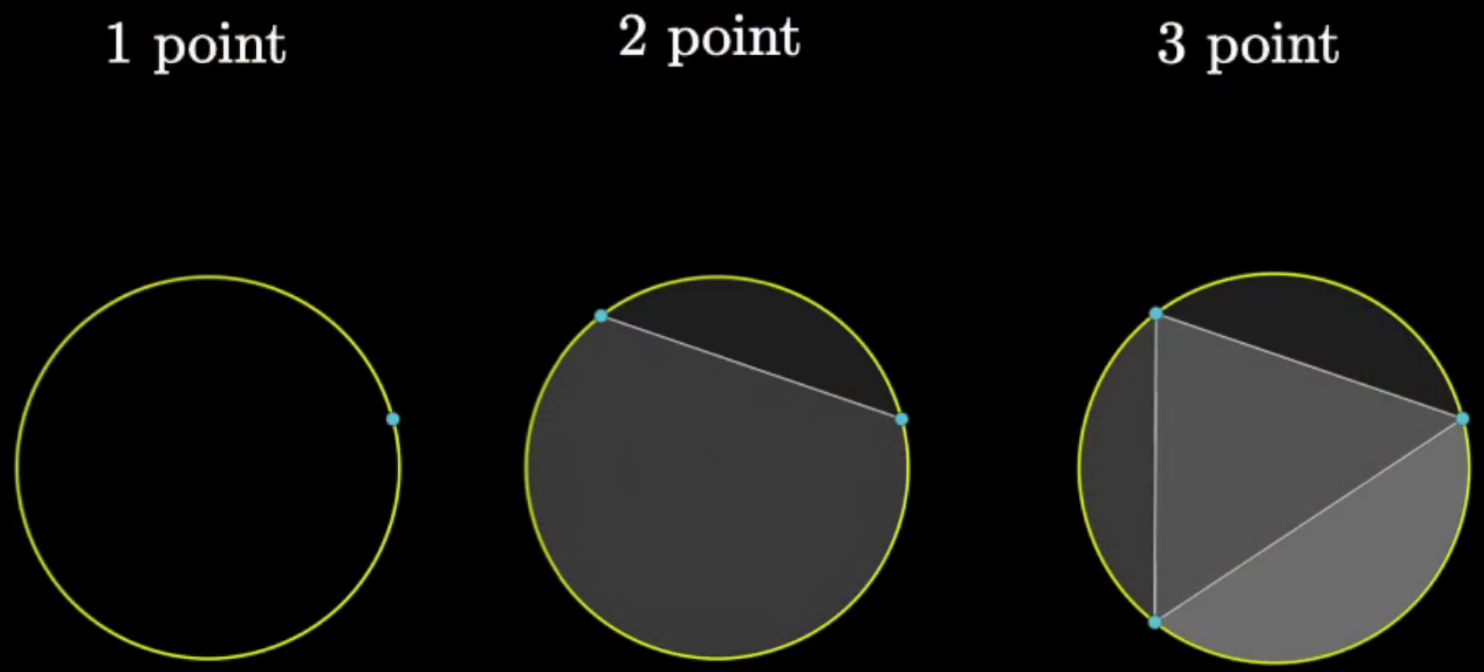


4 points
8 regions

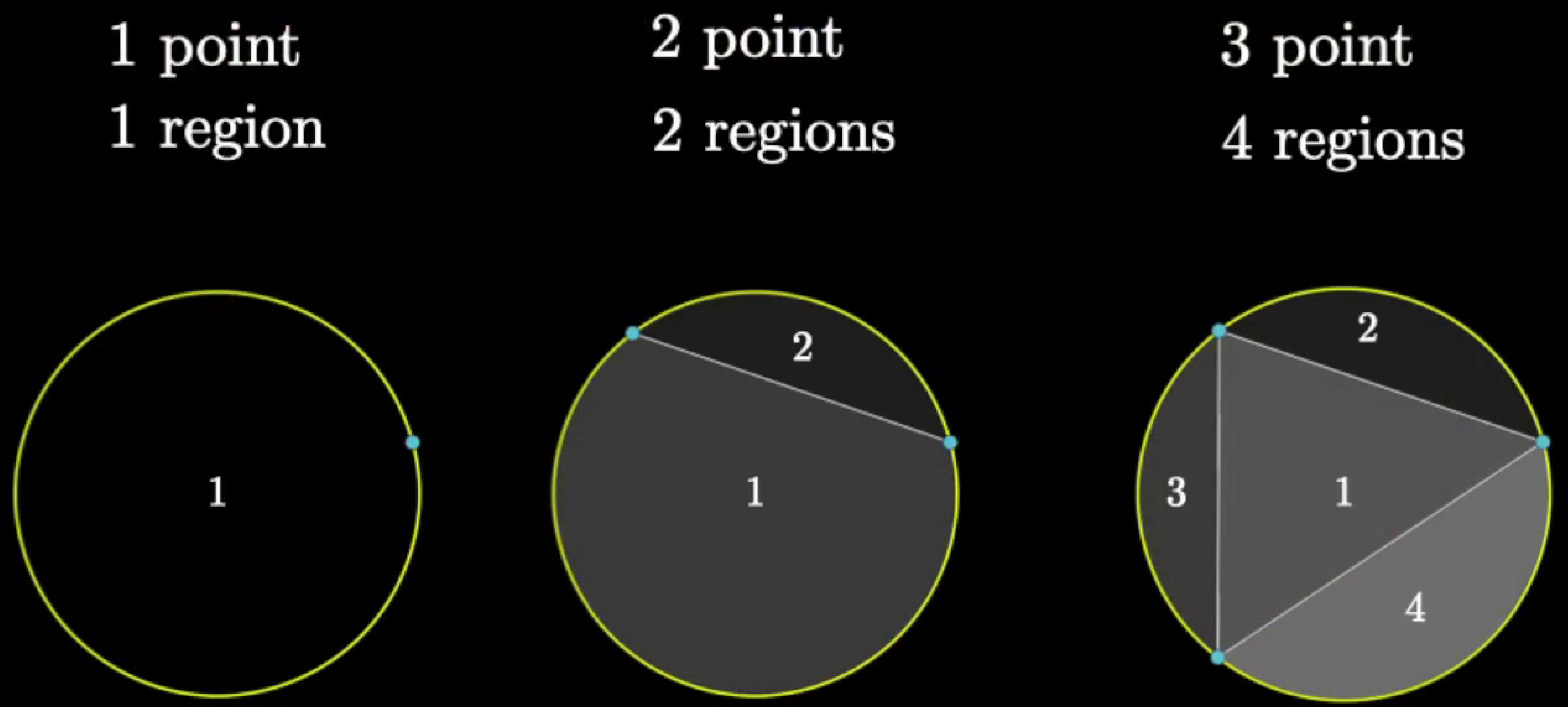


5 points
16 regions

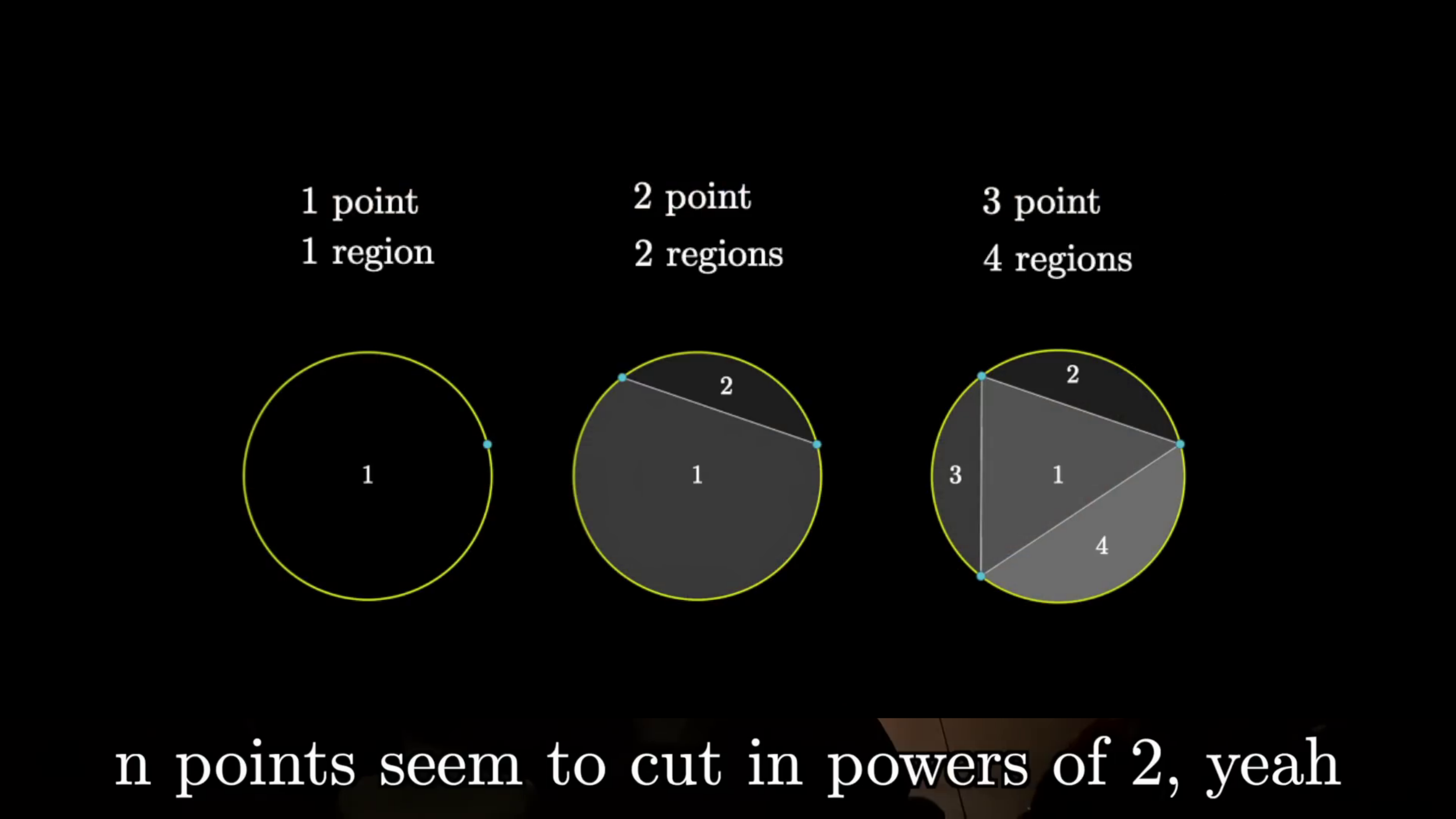




Well I heard there was a sequence of chords

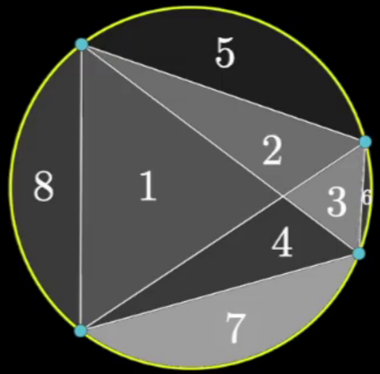


splits the circle to 1, 2, then 4

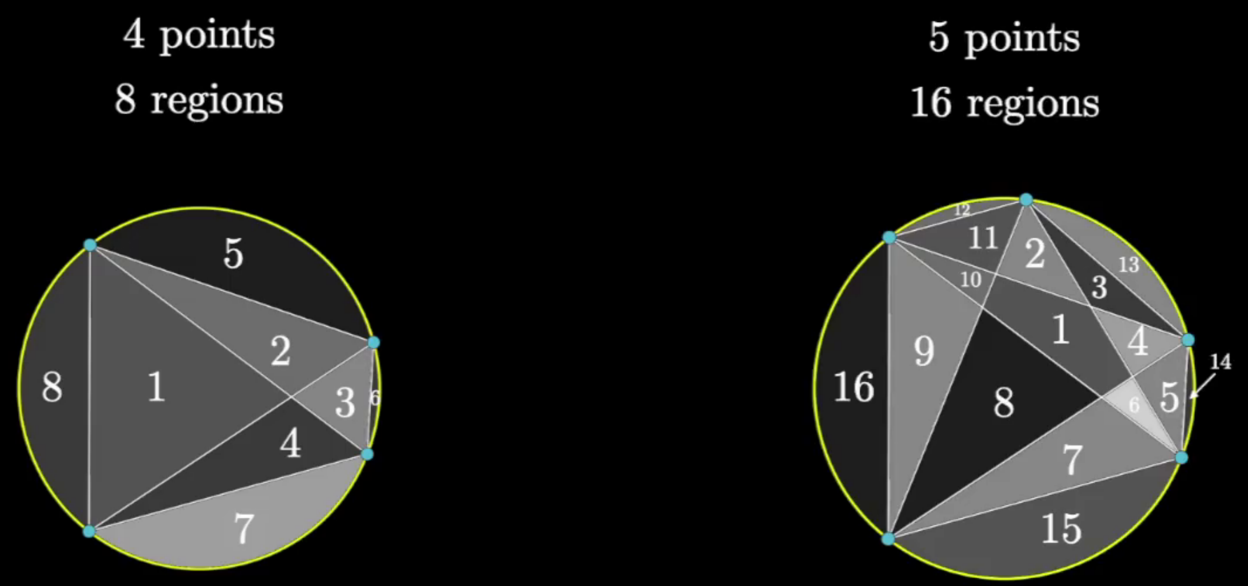

1 point
1 region
2 point
2 regions
3 point
4 regions
1
2
1
2
3
1
4
n points seem to cut in powers of 2, yeah

4 points

8 regions

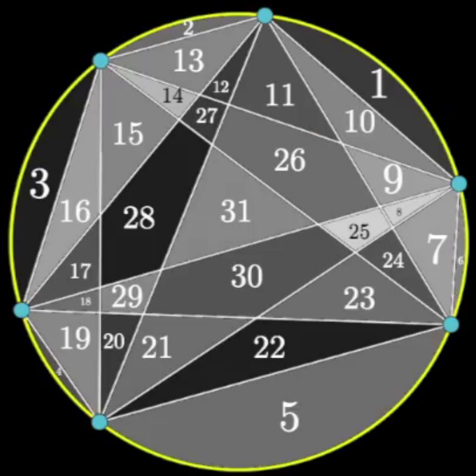


it goes on like this, with the 4th and the 5th



it goes on like this, with the 4th and the 5th

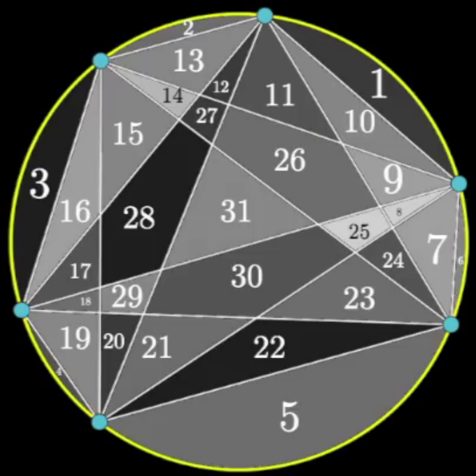
6 points



but something's odd, when you add a 6th

6 points

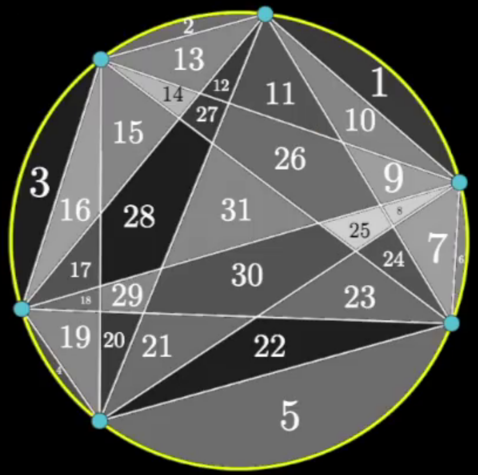
31 regions



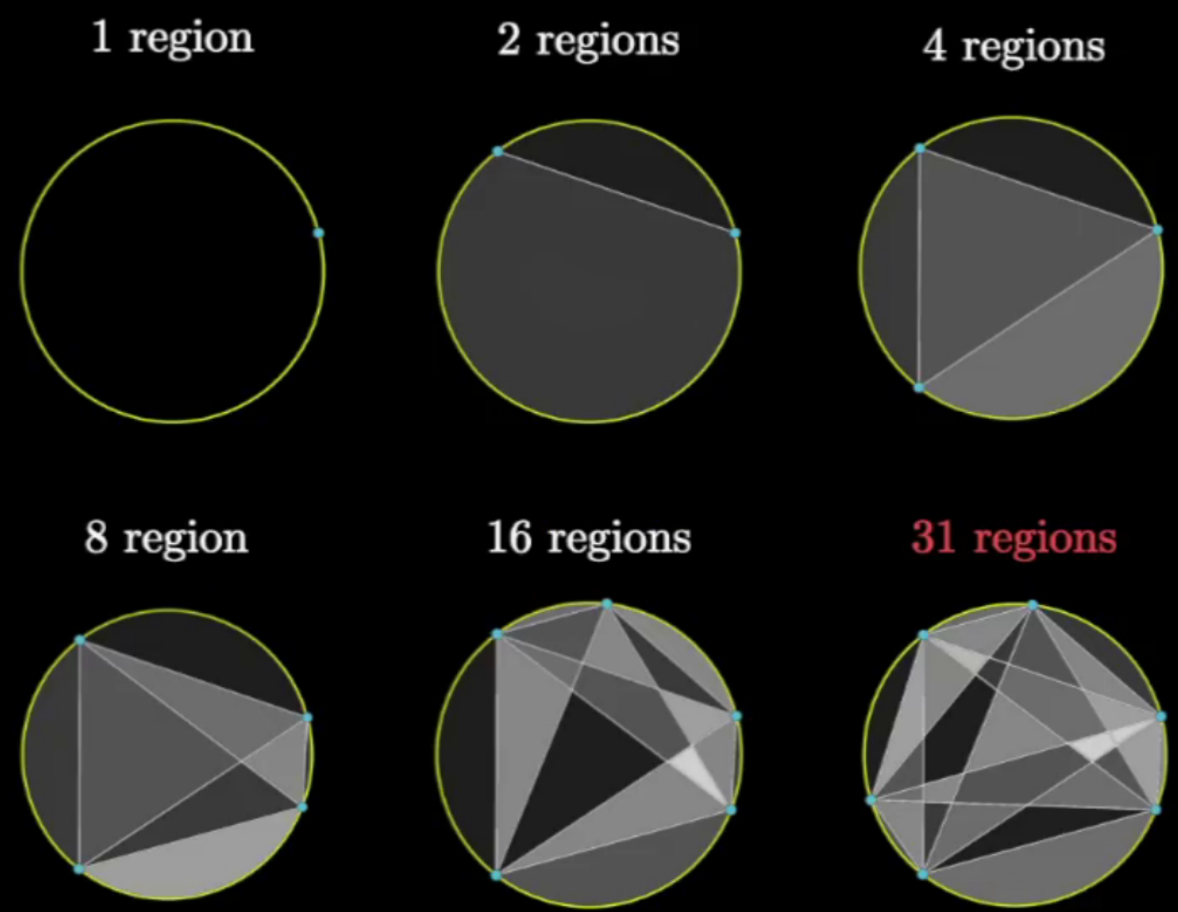
it cuts in 31

6 points

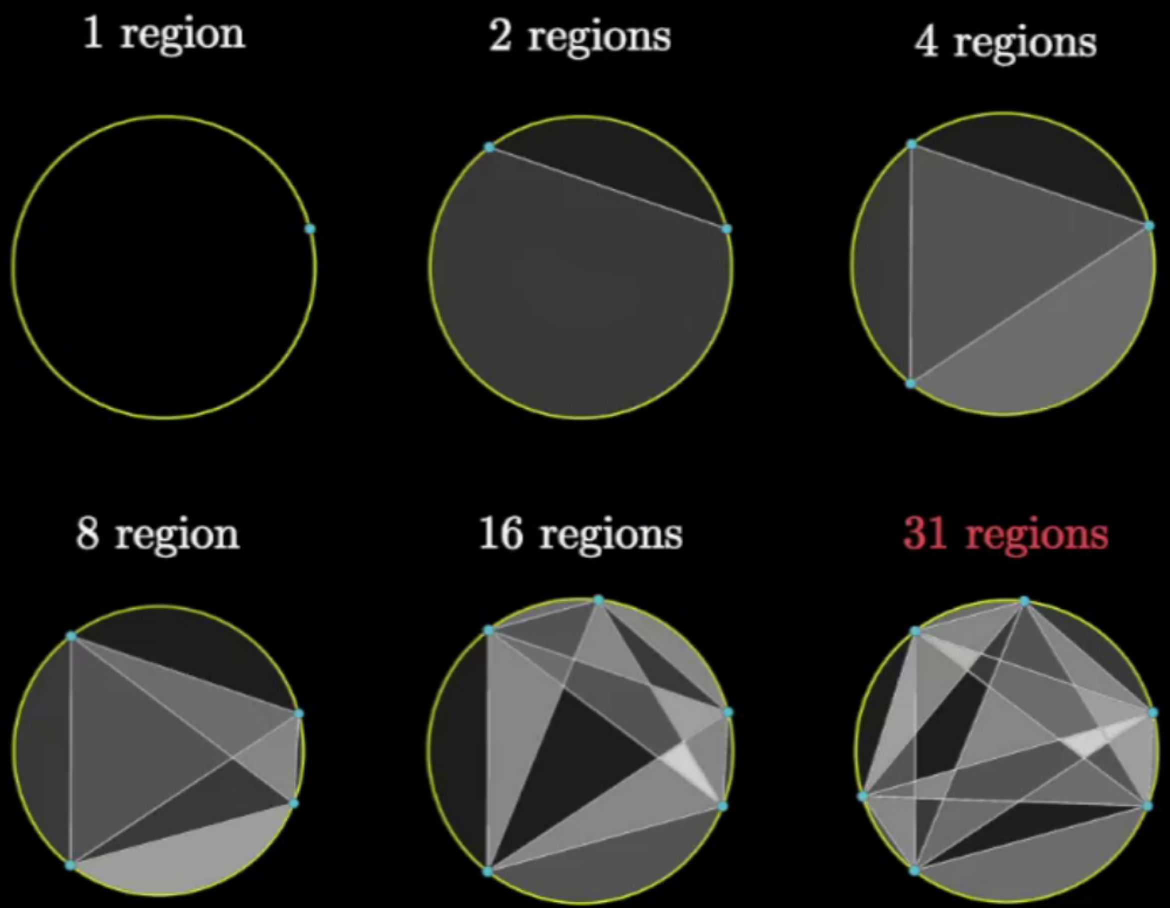
31 regions



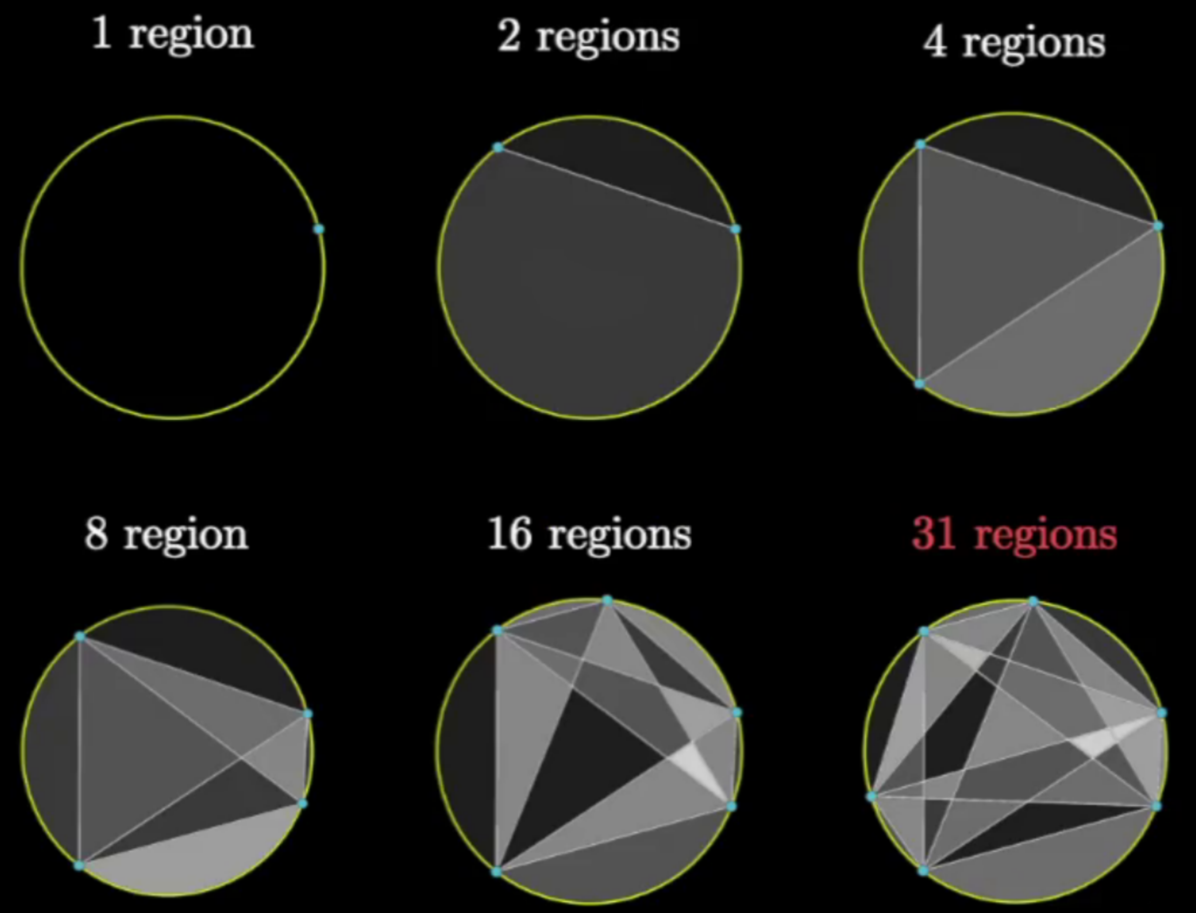
patterns fool ya



how they fool ya, how they fool ya



how they fool ya, how they fooo-ooo-ool ya



when your faith is strong

$$\int_0^\infty \frac{\sin(x)}{x} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} dx = \frac{\pi}{2}$$

you still need proof

$$\int_0^\infty \frac{\sin(x)}{x} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} dx = \frac{\pi}{2}$$

what seems natural to guess

$$\int_0^\infty \frac{\sin(x)}{x} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} dx = \frac{\pi}{2}$$

can lead to a goof

$$\int_0^\infty \frac{\sin(x)}{x}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}dx = \frac{\pi}{2}$$

each integral up on the left is pi over 2, yeah

$$\int_0^\infty \frac{\sin(x)}{x} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} \frac{\sin(x/15)}{x/15} dx = \frac{\pi}{2} \quad ???$$

you might think that's true

$$\int_0^\infty \frac{\sin(x)}{x} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} \frac{\sin(x/15)}{x/15} dx = \frac{\pi}{2} \quad ???$$

for the next, which is fair

$$\int_0^\infty \frac{\sin(x)}{x}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\frac{\sin(x/15)}{x/15}dx = \frac{\pi}{2} \quad ???$$

but like a joke we've shown

$$\int_0^\infty \frac{\sin(x)}{x}\,dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\,dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\,dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\,dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\frac{\sin(x/15)}{x/15}\,dx = \frac{\pi}{2} - 0.0000000000231006\ldots$$

that it's off by a hair

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\frac{\sin(x/15)}{x/15}dx = \frac{\pi}{2} - 0.0000000000231006\ldots$$

More precisely, it's off by $\frac{6,879,714,958,723,010,531}{935,615,849,440,640,907,310,521,750,000}\pi$

it's a subtle slip, but it's true the

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\,dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\,dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\,dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\frac{\sin(x/15)}{x/15}\,dx = \frac{\pi}{2} - 0.0000000000231006\ldots$$

More precisely, it's off by $\frac{6{,}879{,}714{,}958{,}723{,}010{,}531}{935{,}615{,}849{,}440{,}640{,}907{,}310{,}521{,}750{,}000}\pi$

pattern fooled ya

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x} \frac{\sin(x/3)}{x/3} \frac{\sin(x/5)}{x/5} \cdots \frac{\sin(x/13)}{x/13} \frac{\sin(x/15)}{x/15} dx = \frac{\pi}{2} - 0.0000000000231006\ldots$$

More precisely, it's off by $\frac{6{,}879{,}714{,}958{,}723{,}010{,}531}{935{,}615{,}849{,}440{,}640{,}907{,}310{,}521{,}750{,}000}\pi$

how they fool ya, how they fool ya

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}dx = \frac{\pi}{2}$$

$$\vdots$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}dx = \frac{\pi}{2}$$

$$\int_0^\infty \frac{\sin(x)}{x}\frac{\sin(x/3)}{x/3}\frac{\sin(x/5)}{x/5}\cdots\frac{\sin(x/13)}{x/13}\frac{\sin(x/15)}{x/15}dx = \frac{\pi}{2} - 0.0000000000231006\ldots$$

Really, though,
wth?

how they fool ya, how they fooo-ooo-oool ya

Prime (base 10)	Same prime (base 4)
5 →	11

now take a prime, and write it in base 4

Prime (base 10)	Same prime (base 4)
5	11

Also a prime
in base 10

read those digits like you'd have before

Prime (base 10)	Same prime (base 4)
5	11
7	13

Also a prime
in base 10

each prime gives a new prime

Prime (base 10)	Same prime (base 4)
5	11
7	13
11	23

↑ Also a prime in base 10

each prime gives a new prime

Prime (base 10)	Same prime (base 4)
5	11
7	13
11	23
13	31

↑ Also a prime in base 10

with this rule, yeah

5

11

23

Base 10 to Base 4

Still prime!

or does it though?

5

11

23

Base 10 to Base 4

113

Still prime!

you'll eventually find

5

11

23

113

1,301

Base 10 to Base 4

Still prime!

new prime are not

5

11

23

113

1,301

Base 10 to Base 4

Still prime!

so simply designed

5

11

23

113

1,301 ↷ Base 10 to Base 4

110,111

patterns hold

5

11

23

113

1,301 Base 10 to Base 4

110,111 $=149\times739$

then they're broken

5

11

23

113

1,301 ↘ Base 10 to Base 4

110,111 $=149\times739$

how they fool ya

Prime (base 10)	Same prime (base 4)
23	113
29	131
31	$133 = 7 \times 19$
37	211
41	$221 = 13 \times 17$
43	223

how they fool ya, how they fool ya

Prime (base 10)	Same prime (base 4)
23	113
29	131
31	133 = 7×19
37	211
41	221 = 13×17
43	223

how they fool ya, how they fooo-ooo-oool ya