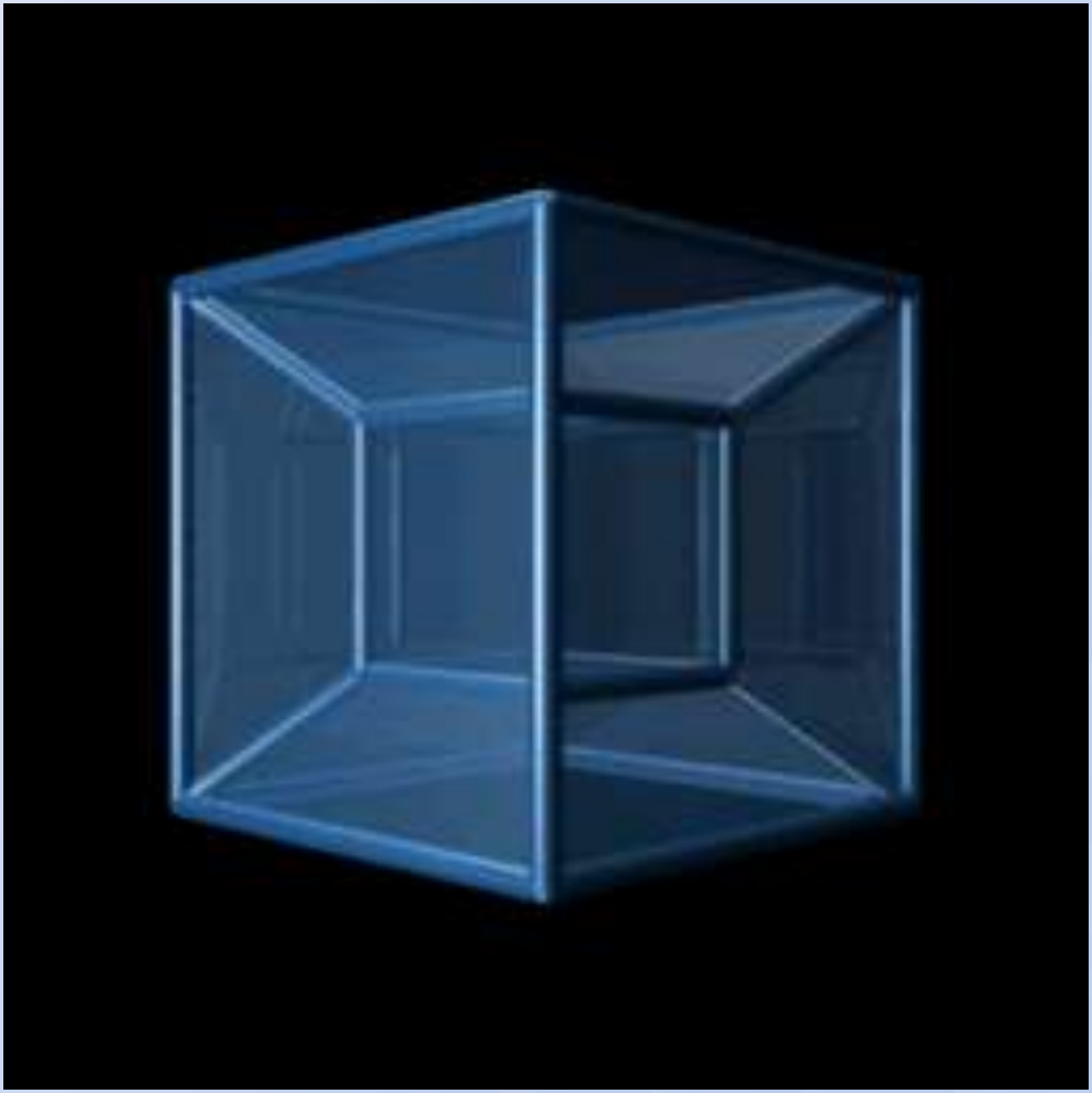


Albanian	matematikë	Indonesian	matematika
Arabic		Italian	matematica
Bulgarian	математика	Japanese	
Catalan	matemàtiques	Latvian	matemātika
Chinese (simplified)	;	Lithuanian	matematika
Chinese (traditional)	;	Maltese	matematika
Croatian	matematika	Norwegian	matematikk
Czech	matematika	Polish	matematyka
Danish	matematik	Portuguese	matemática
Dutch	wiskunde	Romanian	matematică
Estonian	matemaatika	Russian	математика
Filipino	matematika	Serbian	математика
Finnish	matematiikka	Slovak	matematika
French	mathématiques	Slovenian	matematika
Galician	matemática	Spanish	matemáticas
German	mathematic	Swedish	matematik
Greek	μαθηματικά	Thai	
Hebrew		Turkish	matematik
Hindi		Ukranian	математика
Hungarian	matematika	Vietnamese	toán học

What is in a word?

The Universal Language

Mathematics appears to be the only language shared by all human beings regardless of culture, religion, or gender.

Pi is still approximately 3.1 415 926... regardless of what country you are in.

Adding up the cost of a basket full of groceries involves the same mathematical processes regardless of whether the total is expressed in kroner, roubles, or yen.

Do you speak mathematics?

Do you speak mathematics?

Do you speak mathematics?

“Like a native”

Do you speak mathematics?

•This workshop will look closely at how important language is when sharing problems to solve and hopefully finding solutions.

•Without language - what can we do?

•Language would appear to be central to what goes on in the classroom.

•But is language the only vector of teaching and learning?

Do you speak mathematics?

Language would appear to comprise:

- *A vocabulary of symbols or words*
- *A grammar consisting of rules of how these symbols may be used*
- *A community of people who use and understand these symbols*
- *A range of meanings that can be communicated with these symbols*

- R. L. E. Schwarzenberger

The National Strategies | Secondary Mathematics exemplification: Y7 (2008)

GEOMETRY AND MEASURES

Geometrical reasoning identify and use the geometric properties of triangles, quadrilaterals and other polygons to solve problems; explain and justify inferences and deductions using mathematical reasoning.

Use, read and write, **spelling** correctly:
polygon, regular, irregular, convex, concave… circle, triangle, ***isosceles****, equilateral, scalene, right-angled, quadrilateral, square, rectangle, parallelogram, rhombus, trapezium, kite, delta… … … … … … … … …* and names of other polygons.

Visualise and sketch 2-D shapes in different orientations or use **dynamic geometry software** to draw them. Describe what happens and use the properties of shapes to explain why.

Do you speak mathematics?

Spell "Isosceles" 56 Ways.

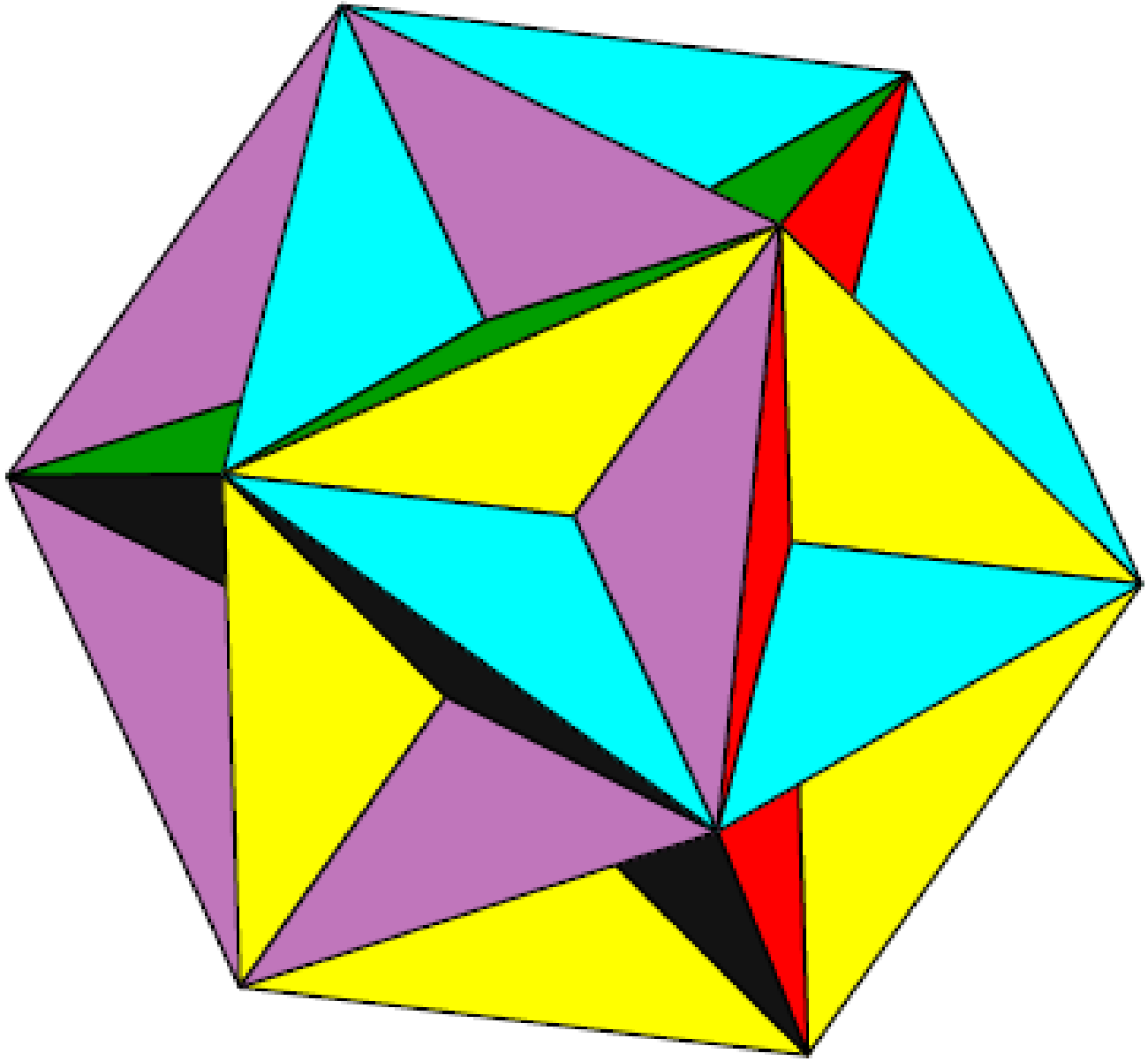
ALBANY, N. Y., March 31.—High school students in New York State, who have tried the Regents' examination in geometry misspelled the word "isosceles" fifty-six different ways it was announced to-day. It was said at the examination division of the State Education Department that pupils sufficently advanced to study geometry are supposed to have passed approved courses in spelling.

The New York Times
Published: April 1, 1914

Do you speak mathematics?

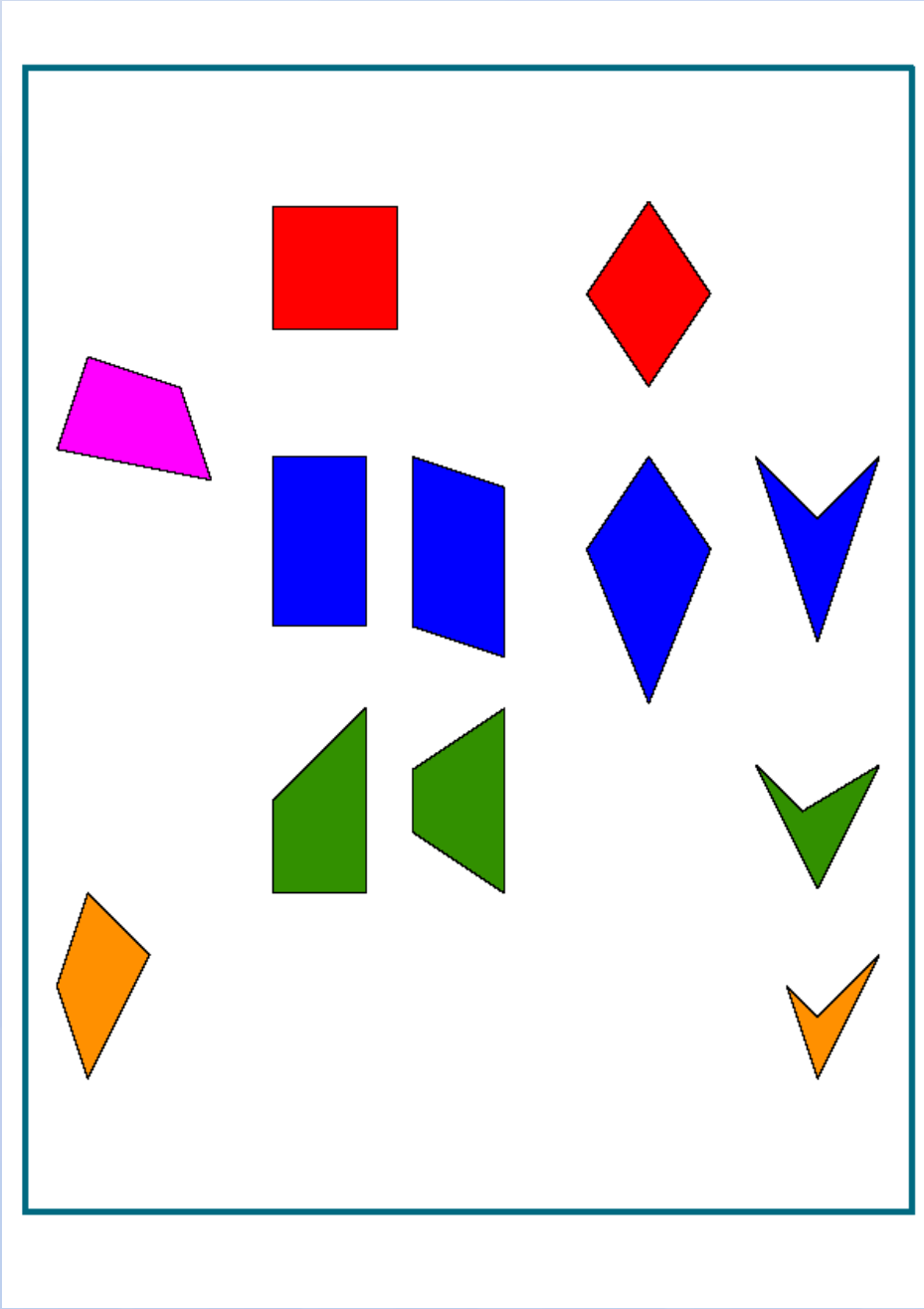
isoseles
isoceles
isaceles
isughceles
isaceles
isockeles
isoteles
isokeles
isoseles
isozeles
isoqeles
isociles ...

What do you see?



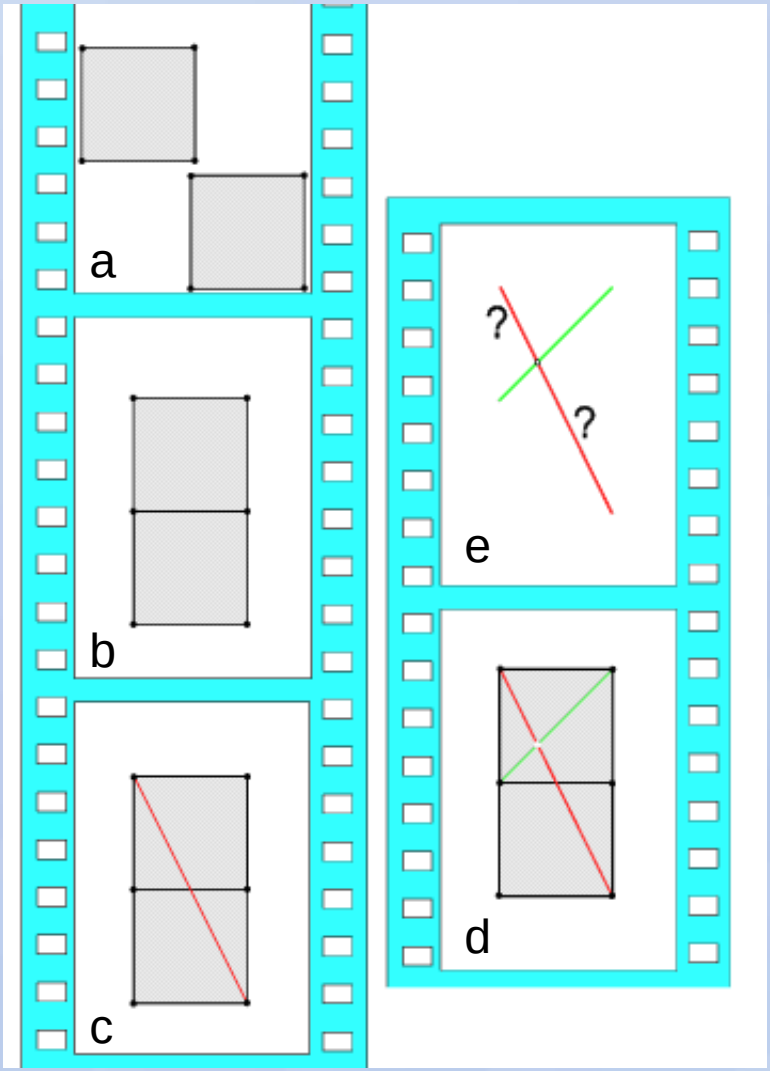
What conclusions can you arrive at?

Talk to your neighbour.

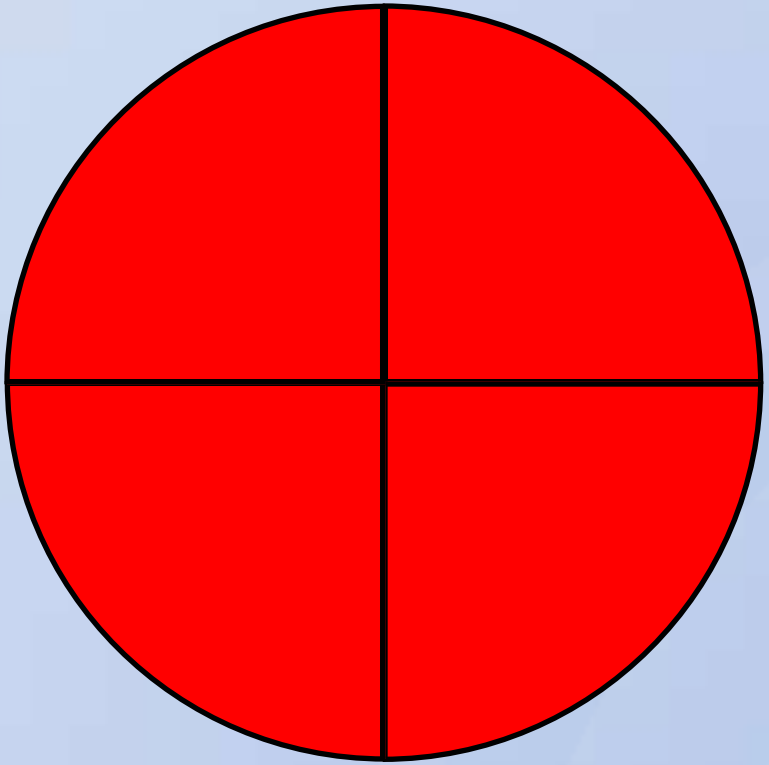


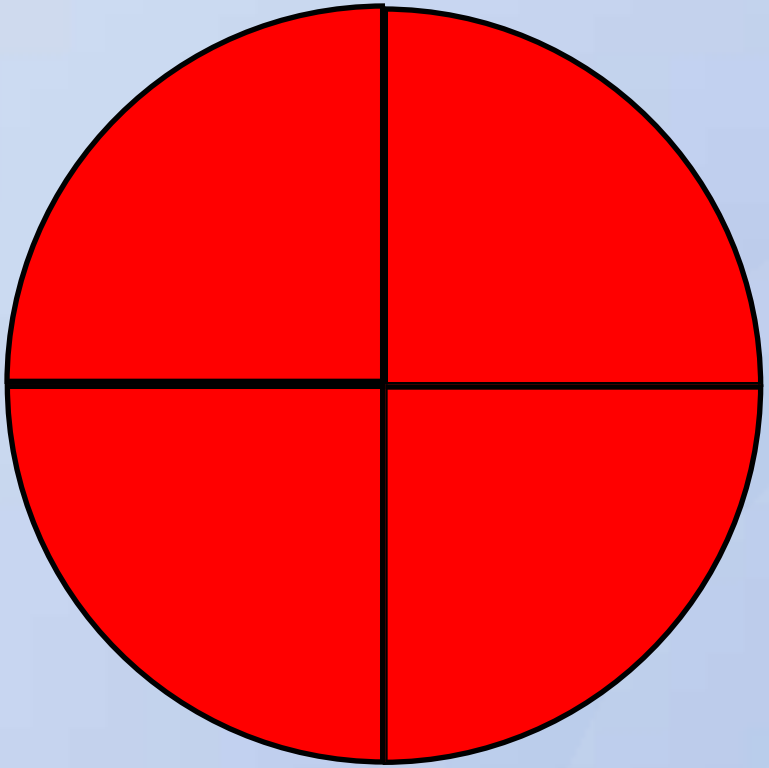
What conclusions can <u>you</u> arrive at?

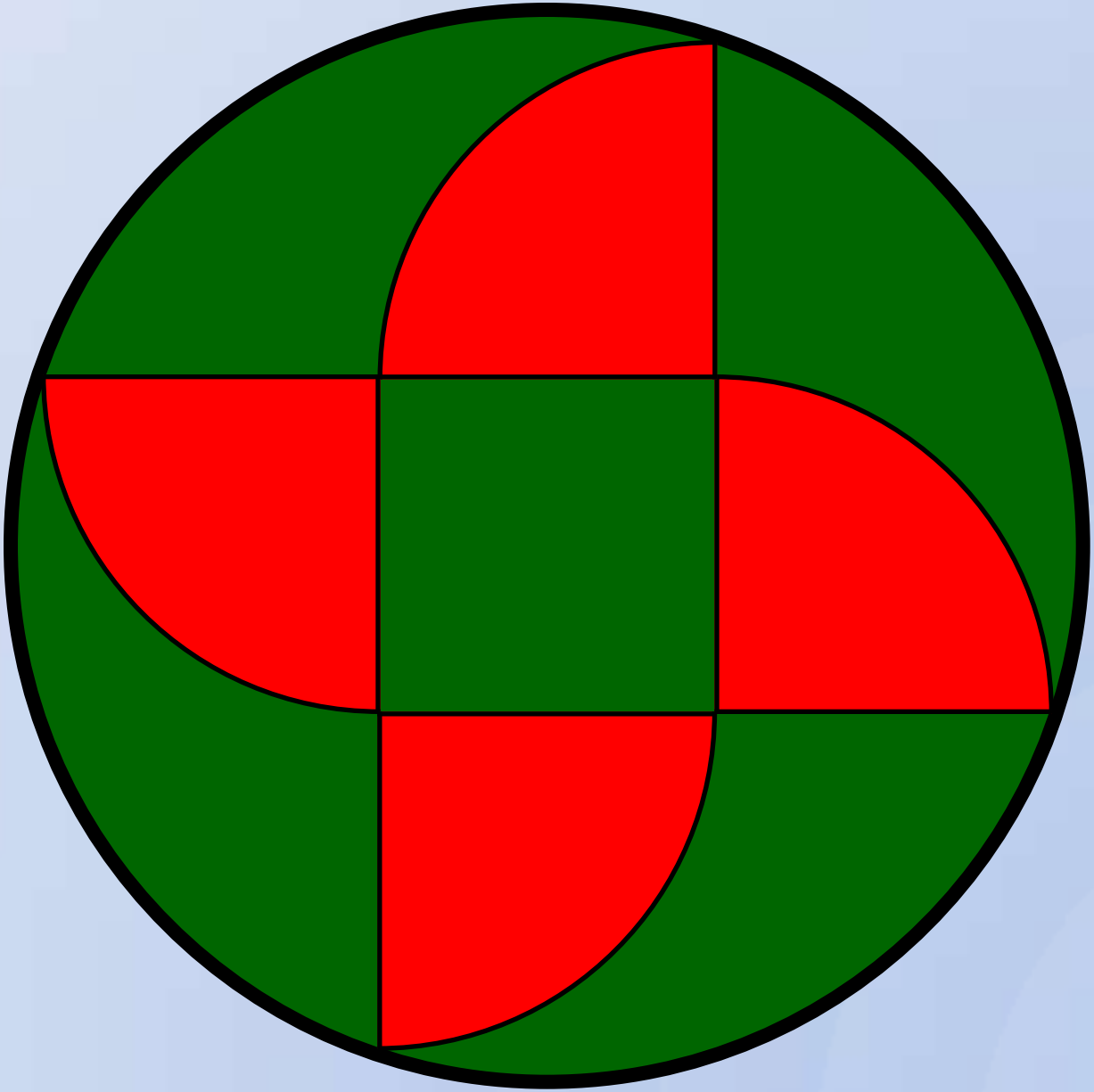
Talk to your neighbour.



Do you speak mathematics?







If a straight line be cut at random, the square on the whole is equal to the squares on the segments and twice the rectangle contained by the segments.

(Euclid, 300 B.C)

Do you speak mathematics?

Do you speak mathematics?

$$(A + B)^2 = A^2 + B^2 + 2AB$$

Do you speak mathematics?

Talking in class ...

... about mathematics and LISTENING to each other **is a way of working**!

... **does not mean** telling someone the answers.

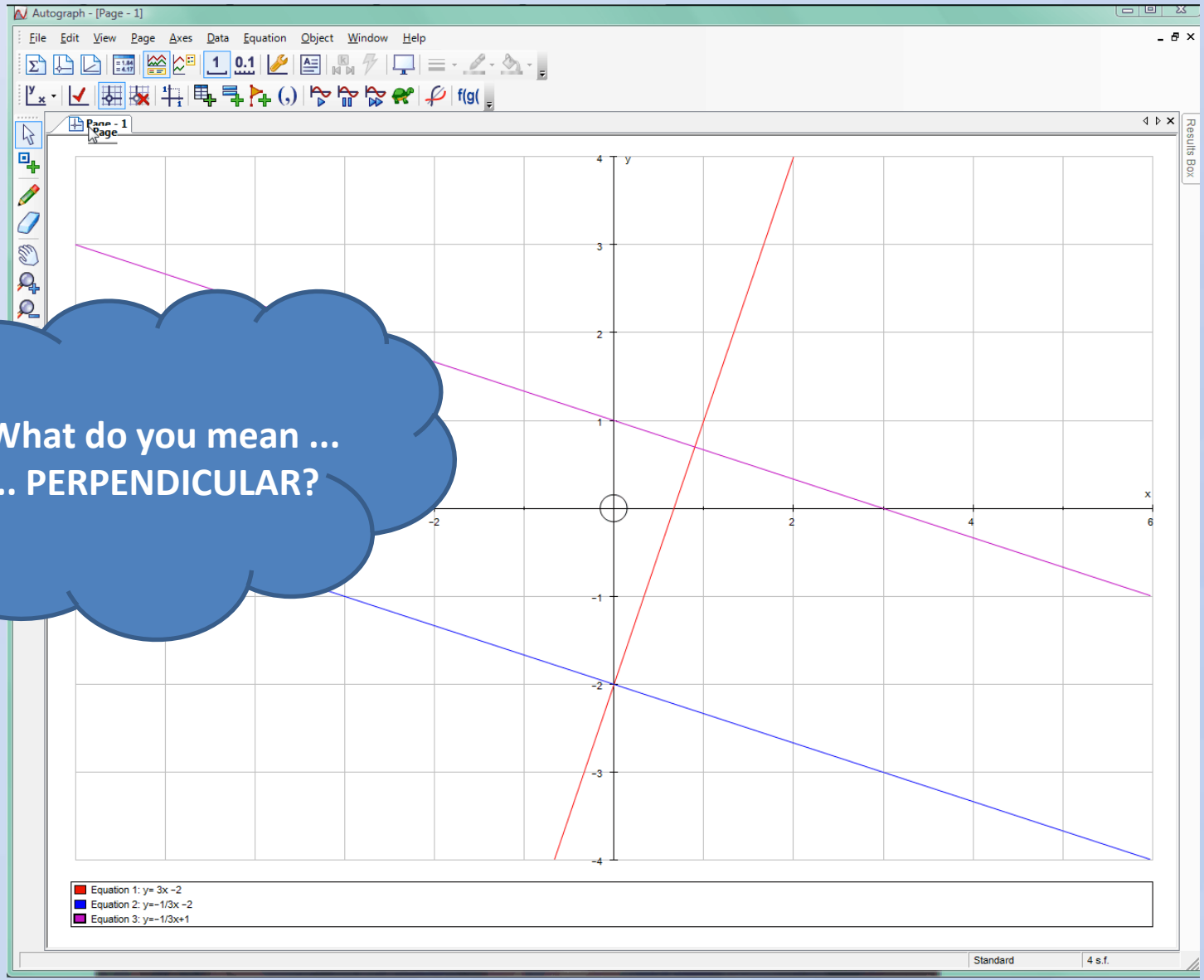
... about a problem **often helps solve it**.

... and sharing ideas **usually helps**.

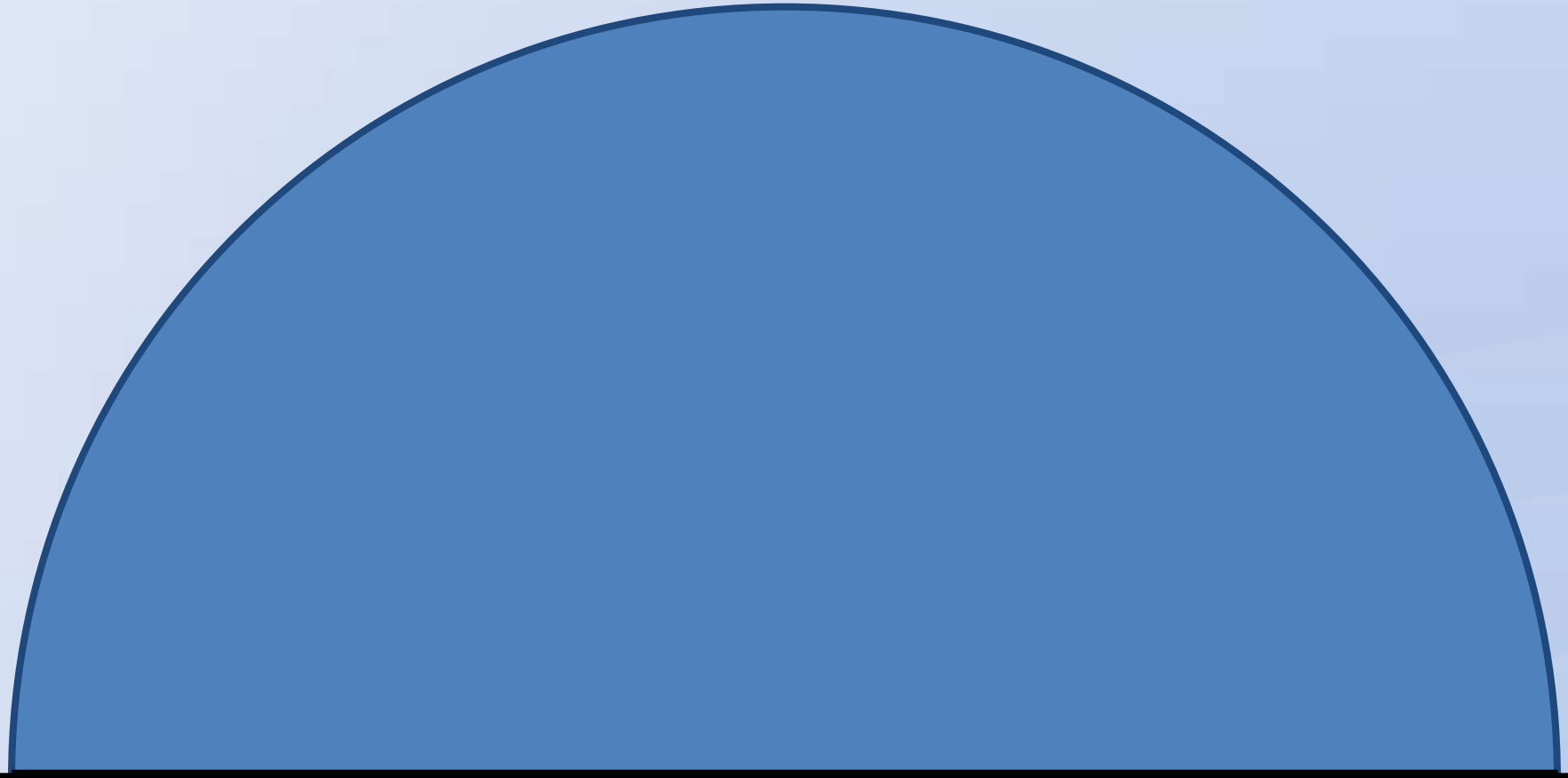
... and explaining something shows that **you have some understanding**.

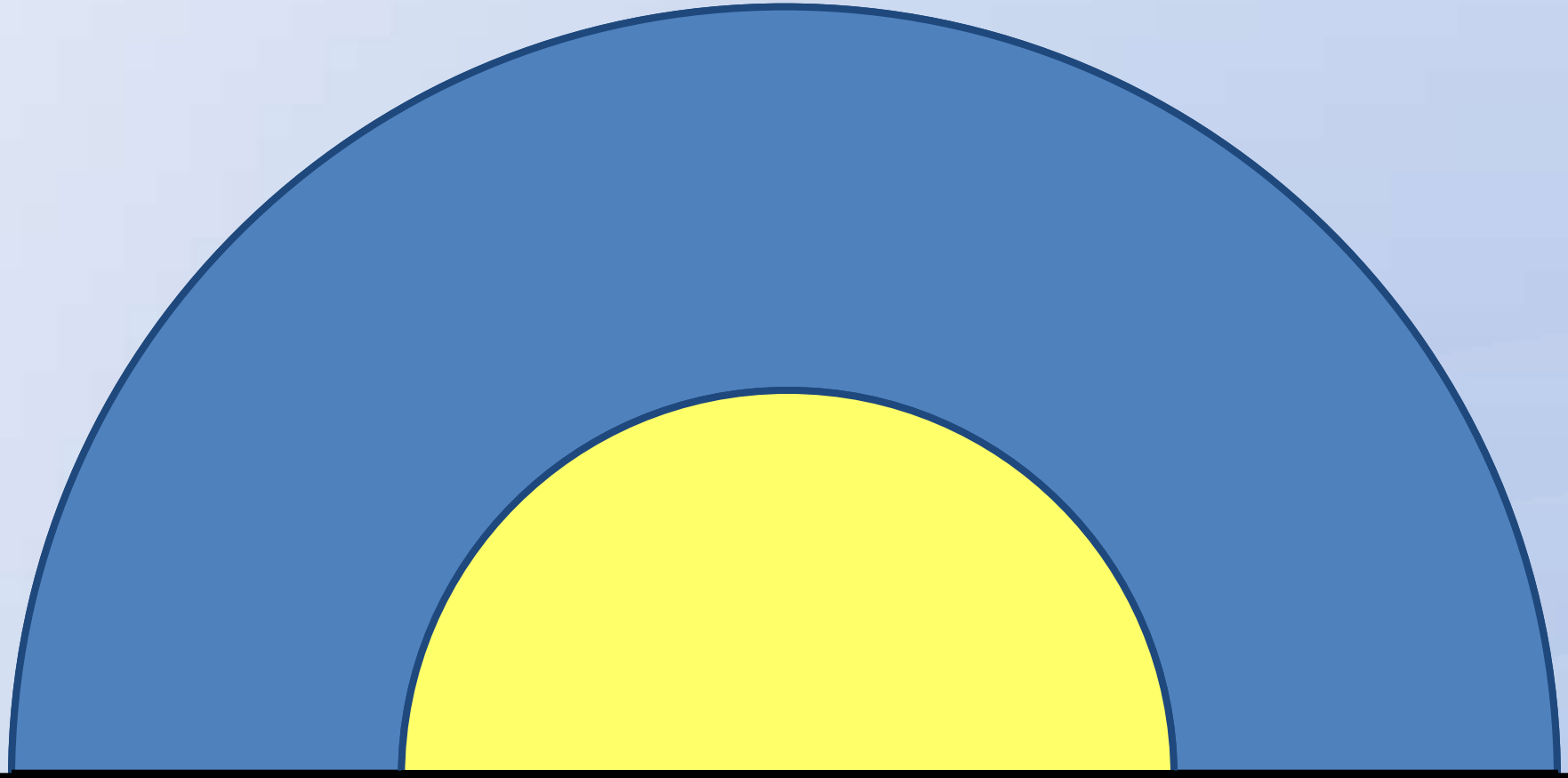
... quietly allows others to do the same.

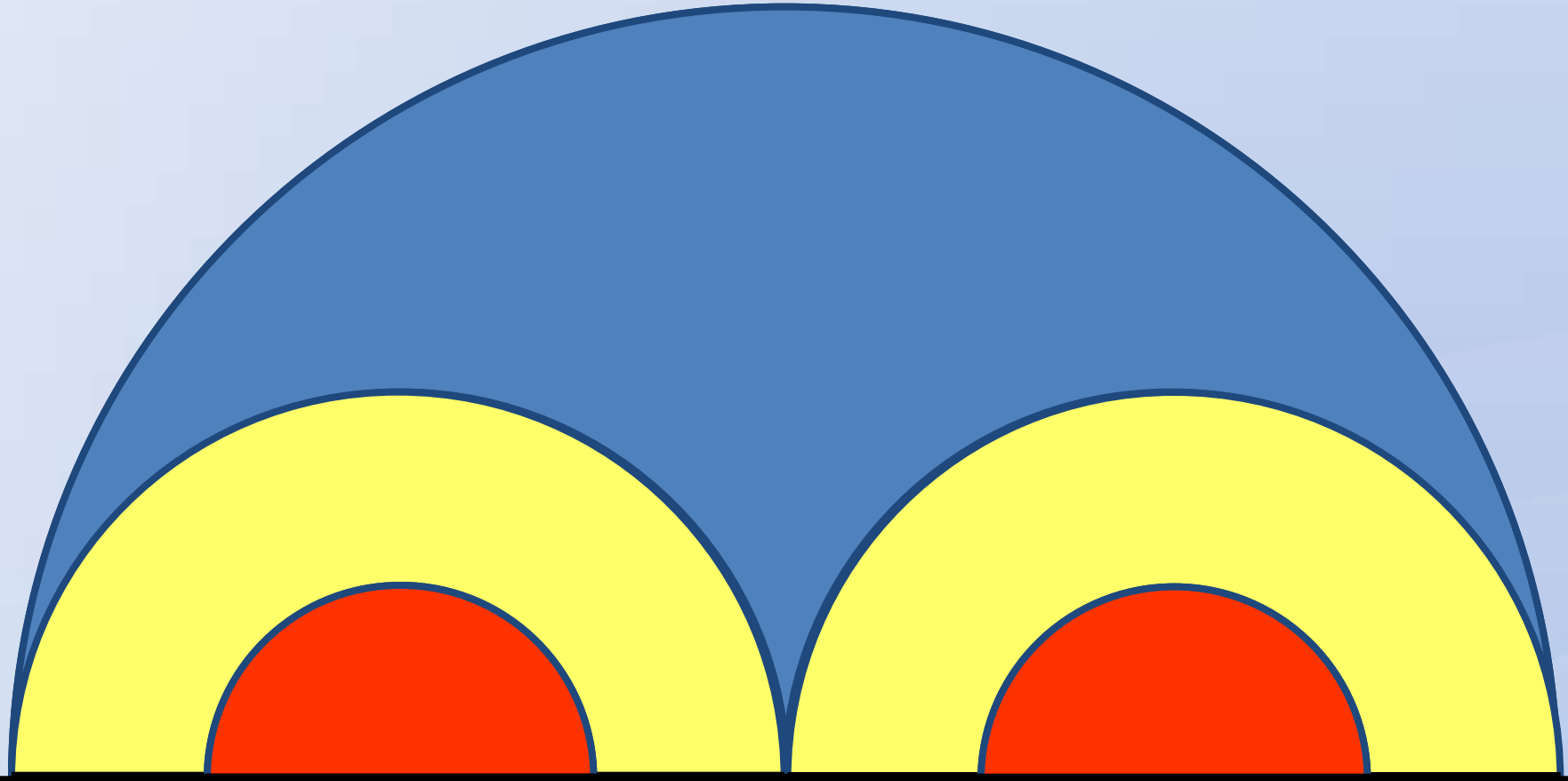
Do you speak mathematics?

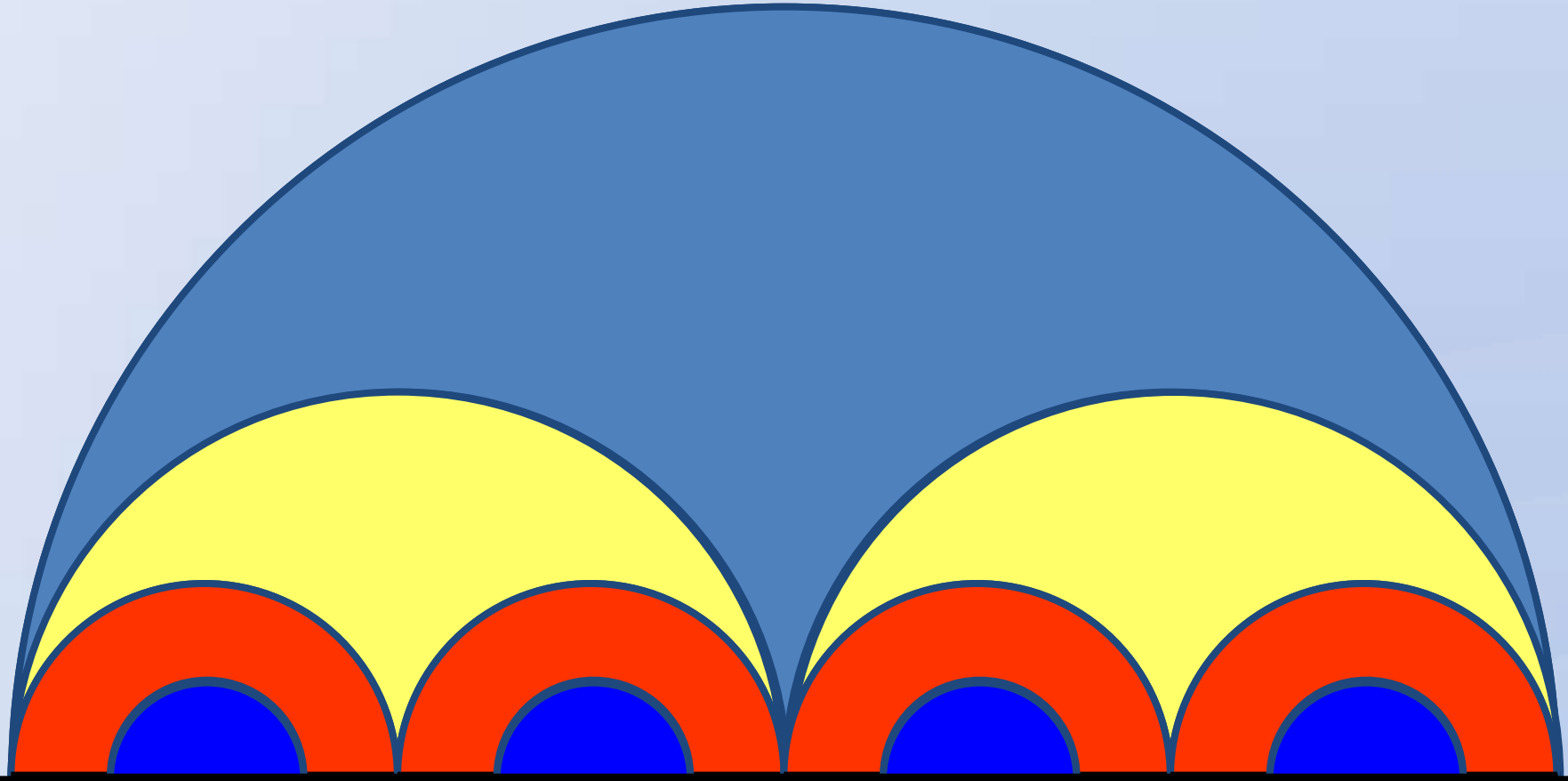


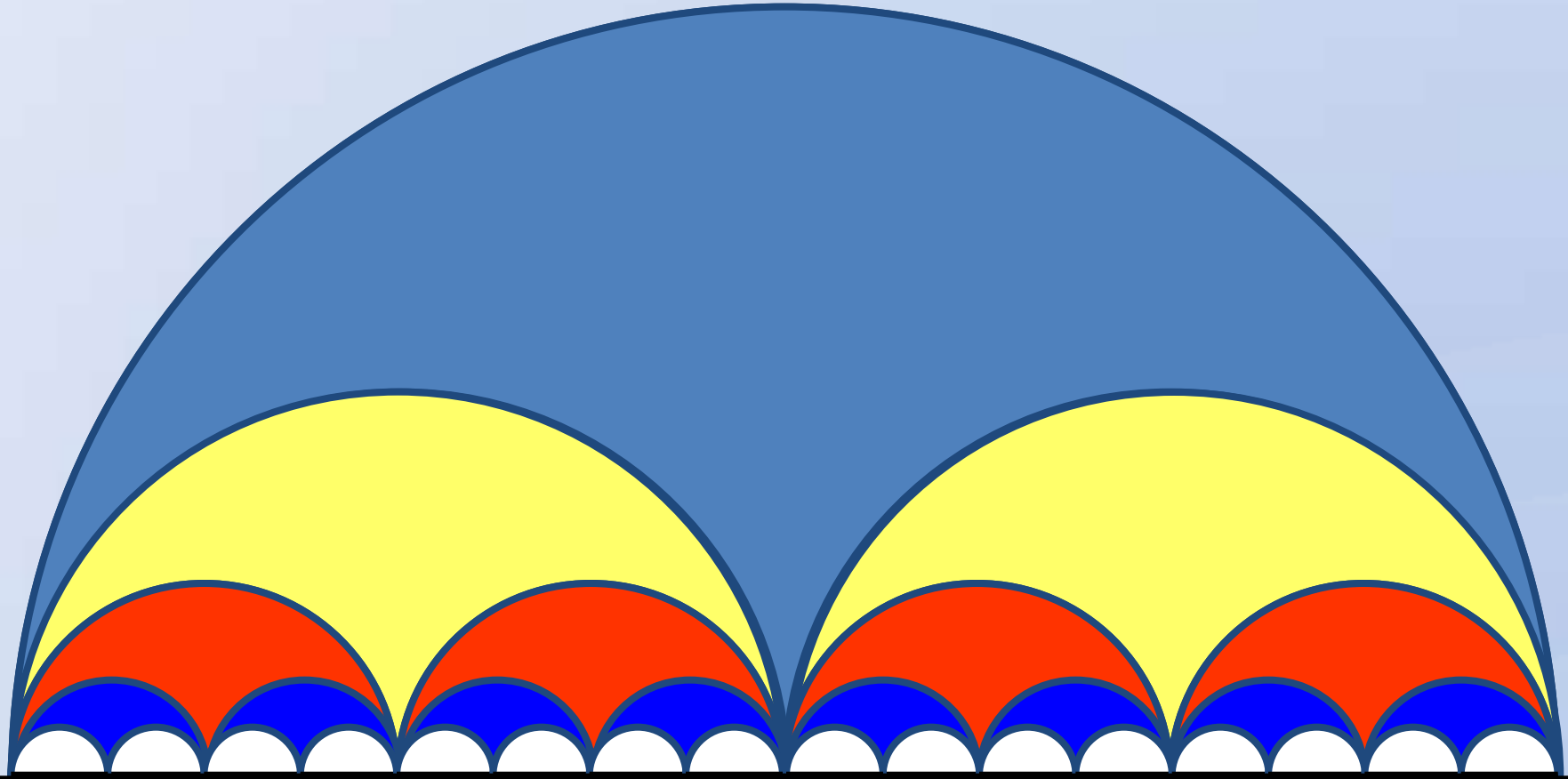
Do you speak mathematics?

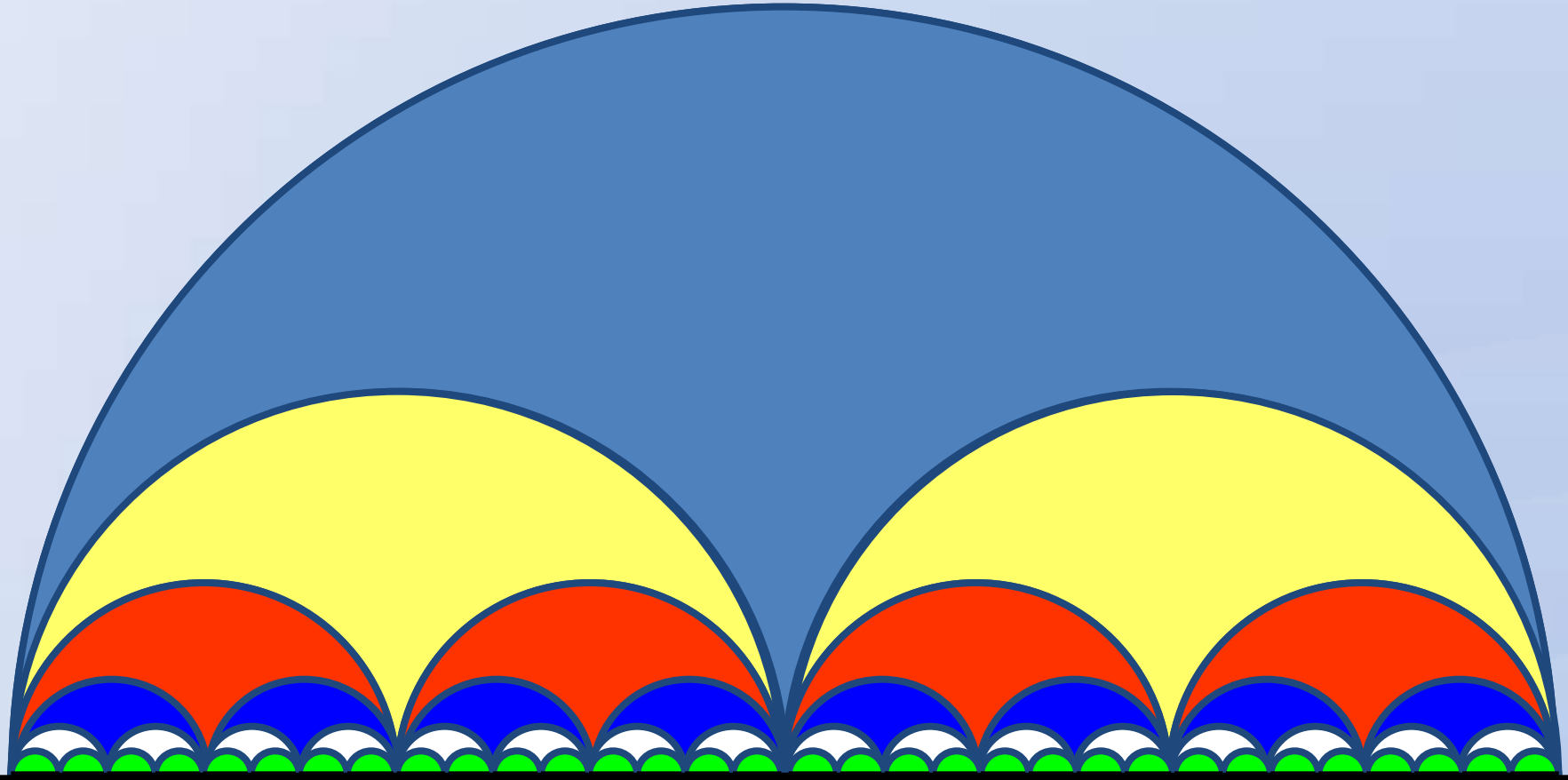


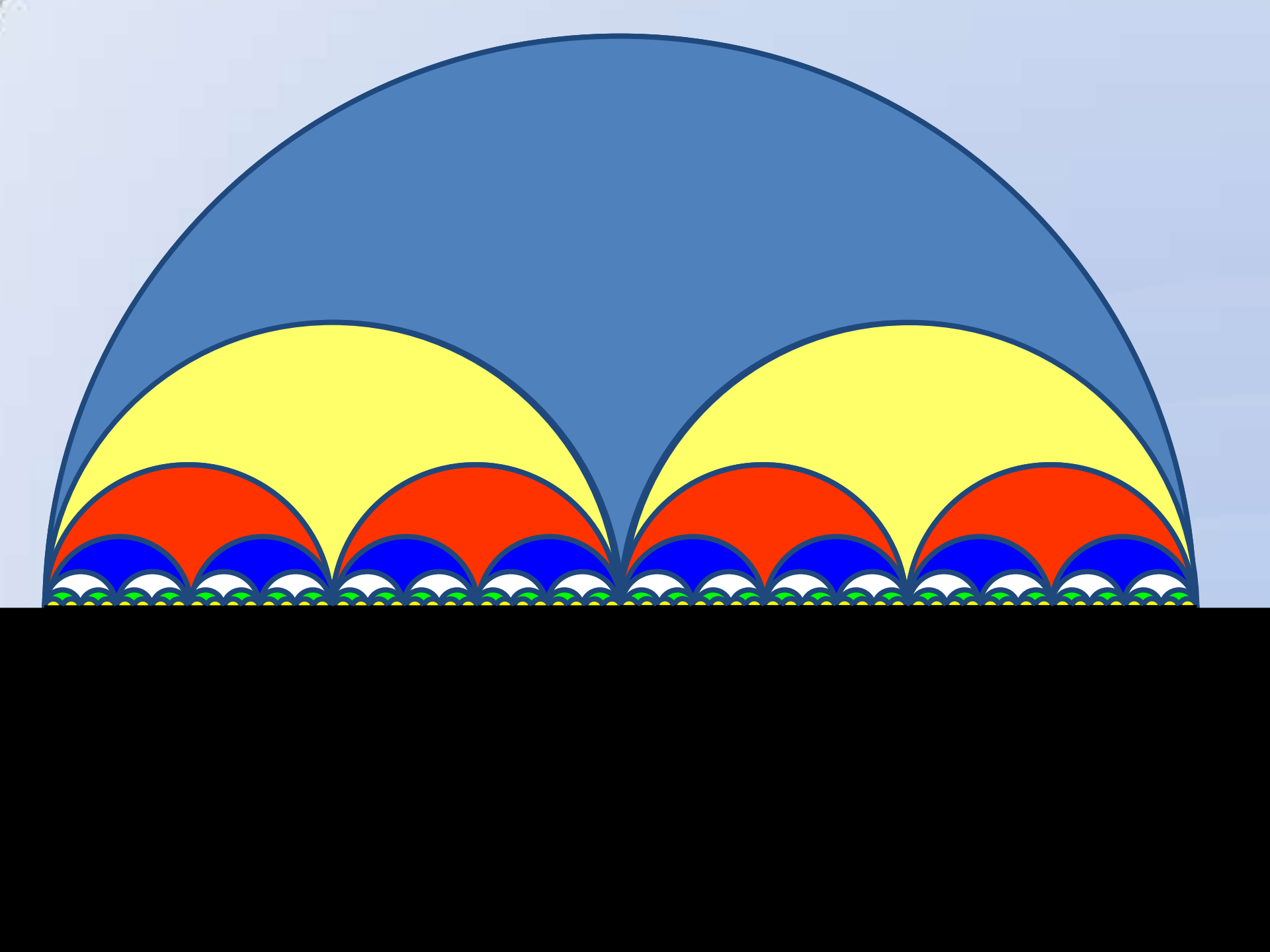


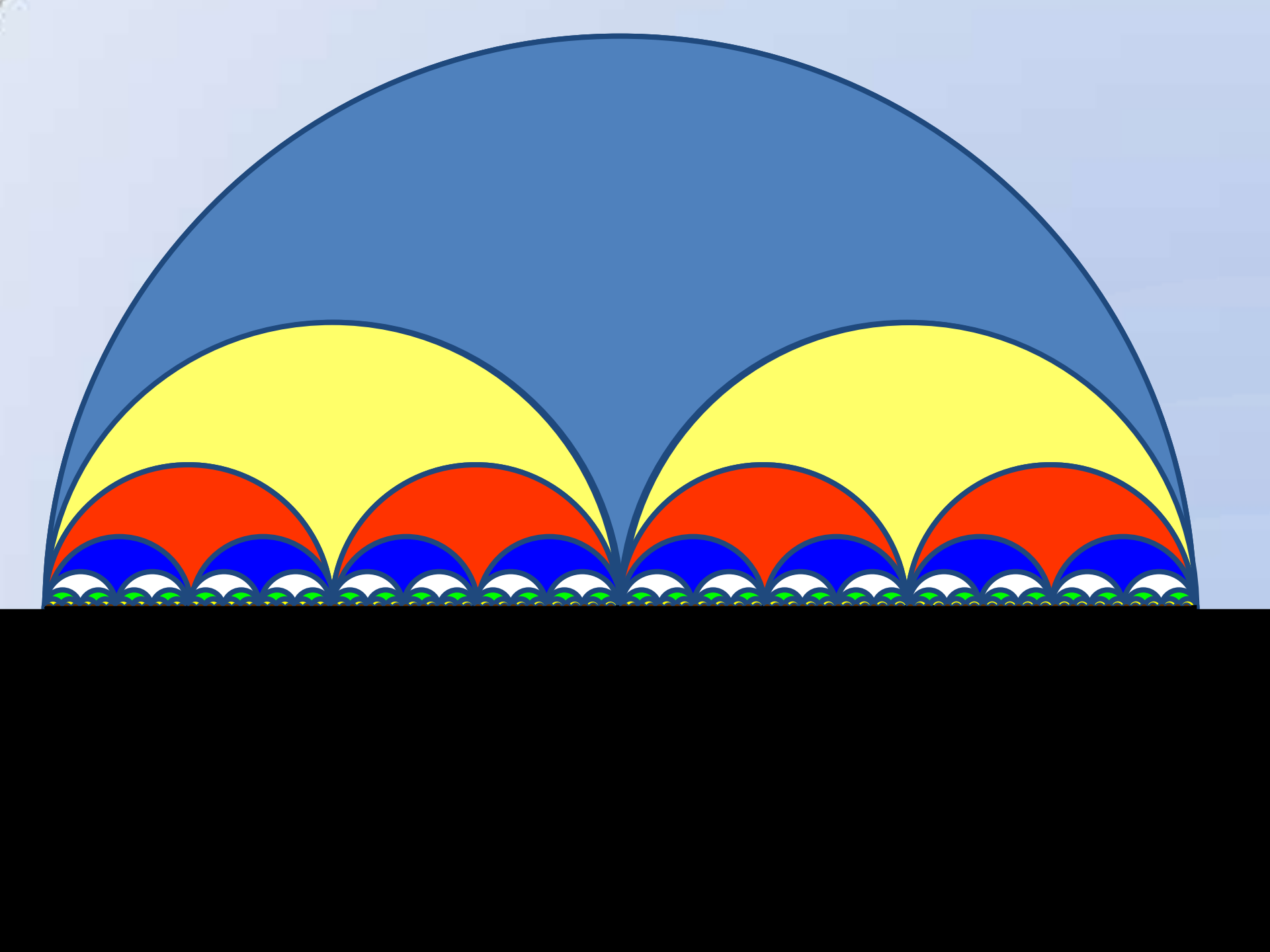










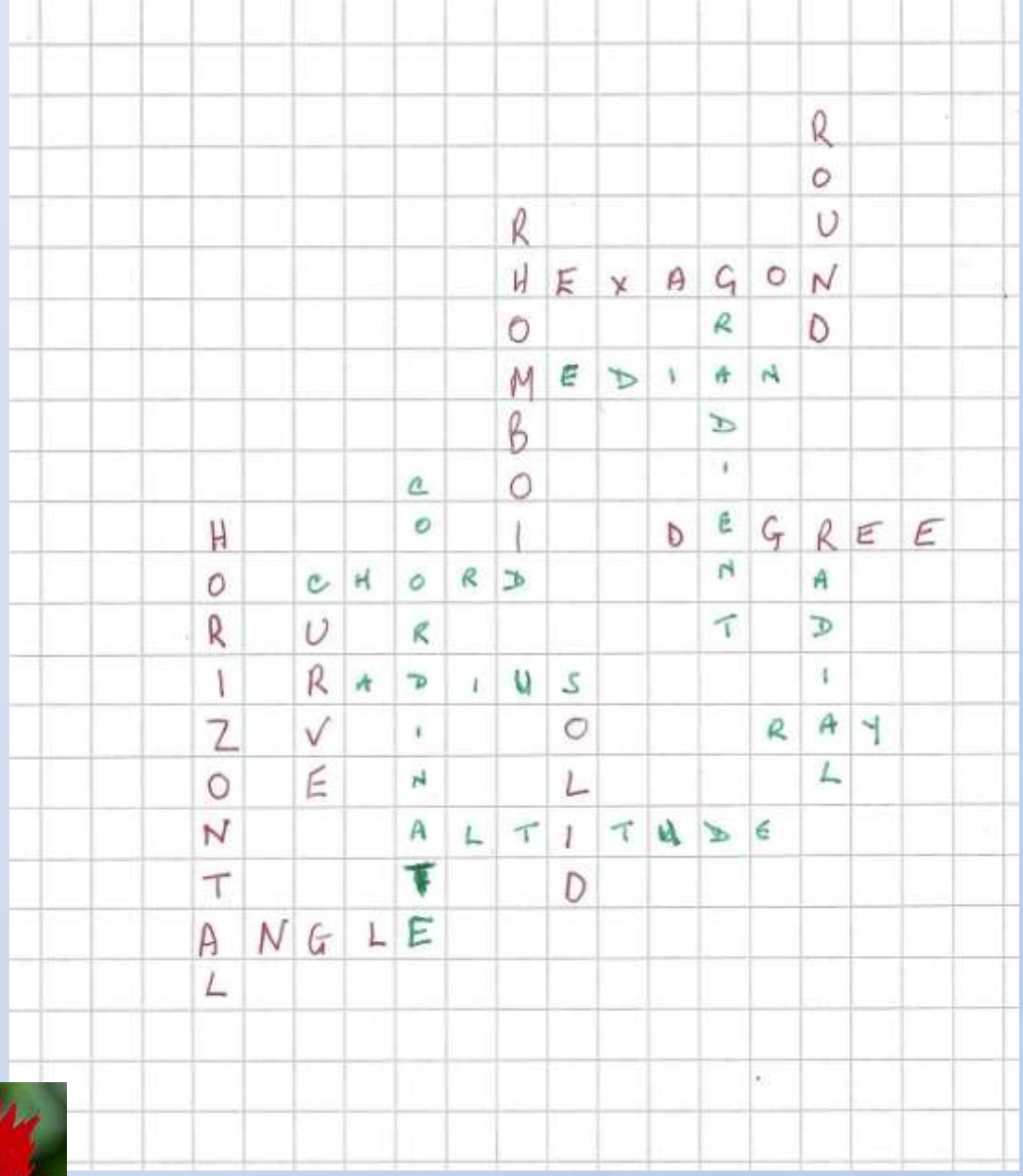


capacity & volume	complementary & supplementary	congruent & similar
bar chart & histogram	necessary & sufficient	probability & odds
possible & probable	sector & segment	recursion & iteration
discrete & continuous	interpolation & extrapolation	explicit & implicit
row & column	dependent & independent	sequence & series
converge & diverge	deduction & induction	convex & concave

and there is always that famous trio - mean, median, mode.

With all these words ... some confusion.

Do you speak mathematics?



Do you speak mathematics?

Out of the mouths of babes and sucklings ...

“Miss, miss this isn’t a circle, its an OBLONG”!

Do you speak mathematics?

Just a Minute … well half a minute … but …

What is a trapezium?

What is a triangle?

What does area mean, what does surface area mean?

What is the difference between a ray, a line segment and a line?

What do you mean by the term symmetry?

Why do we mean by the terms volume and capacity?

Circles and ellipses?

What are oblongs?

Perimeter and circumference?

Horizontal, vertical and perpendicular?

What is angle?

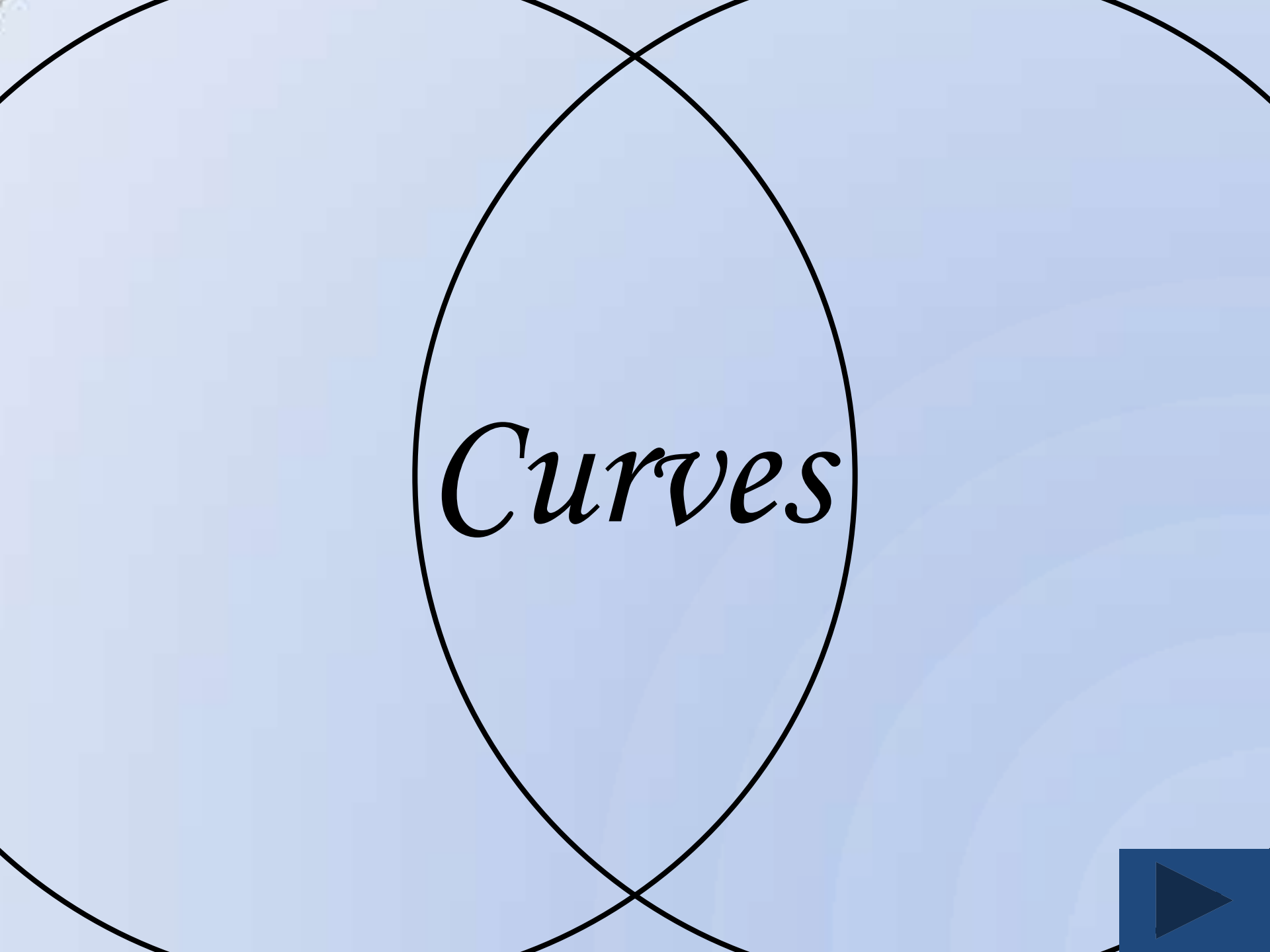
Concavity and convexity

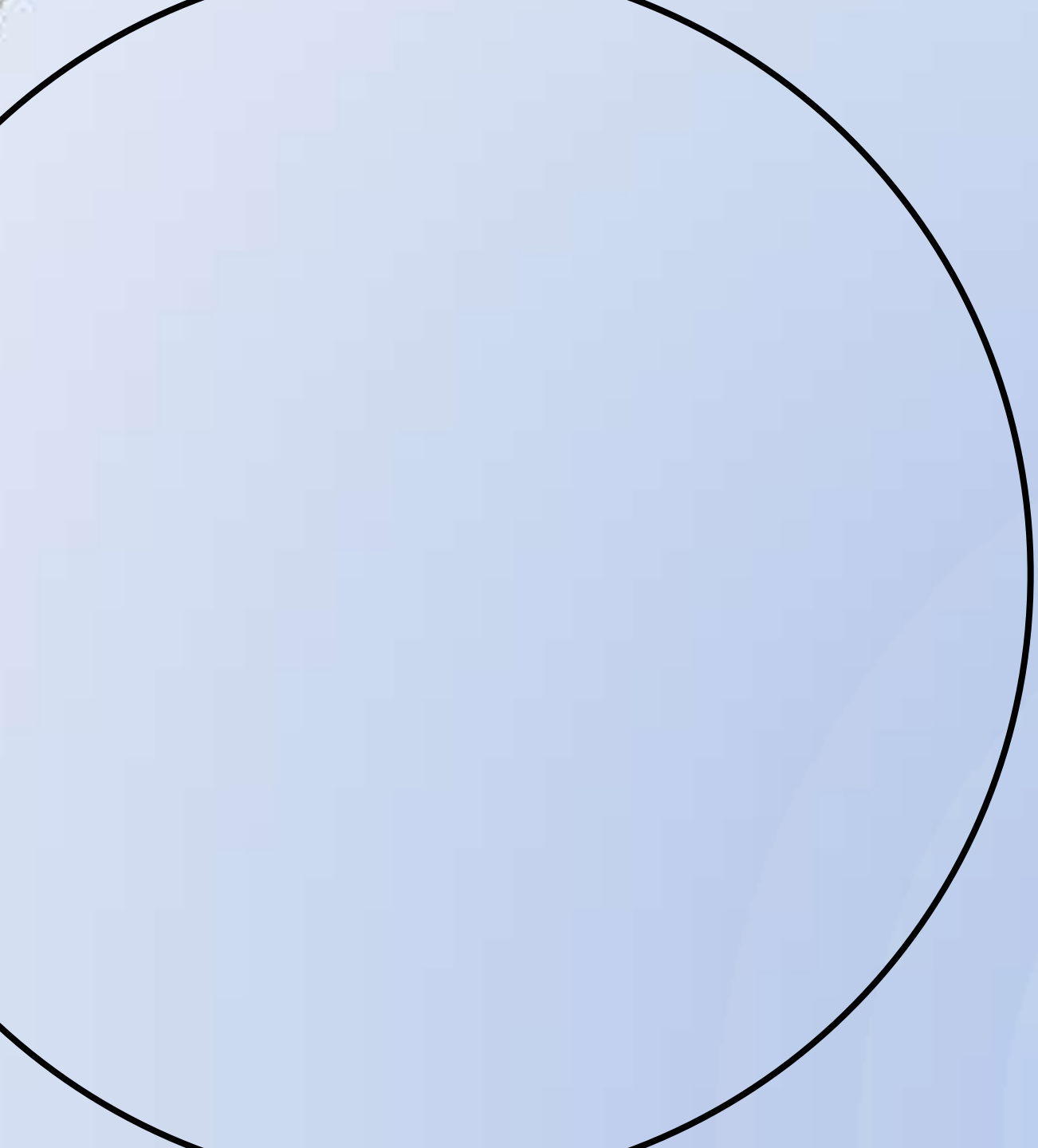
no hesitation

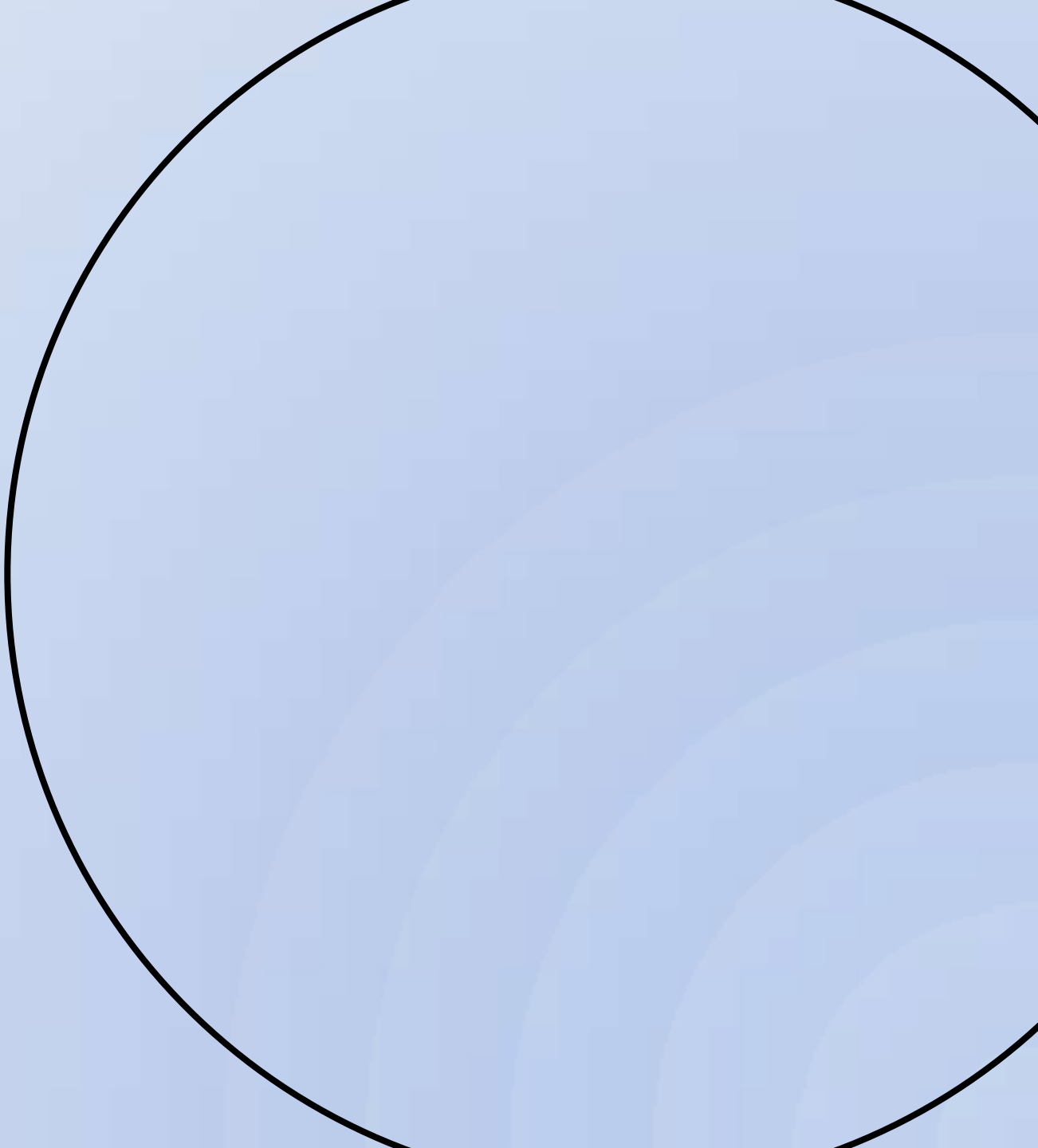
no deviation

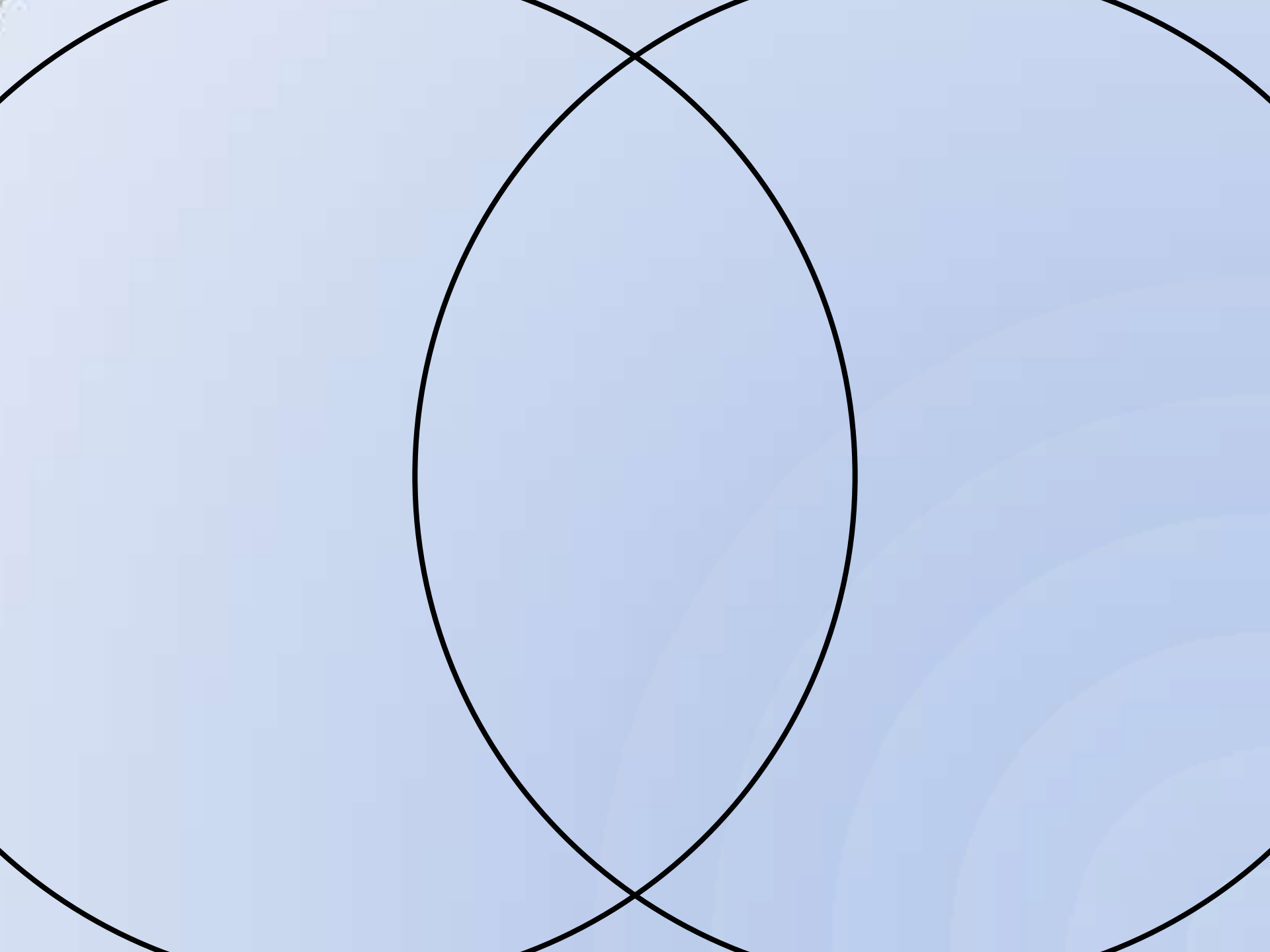
no repetition

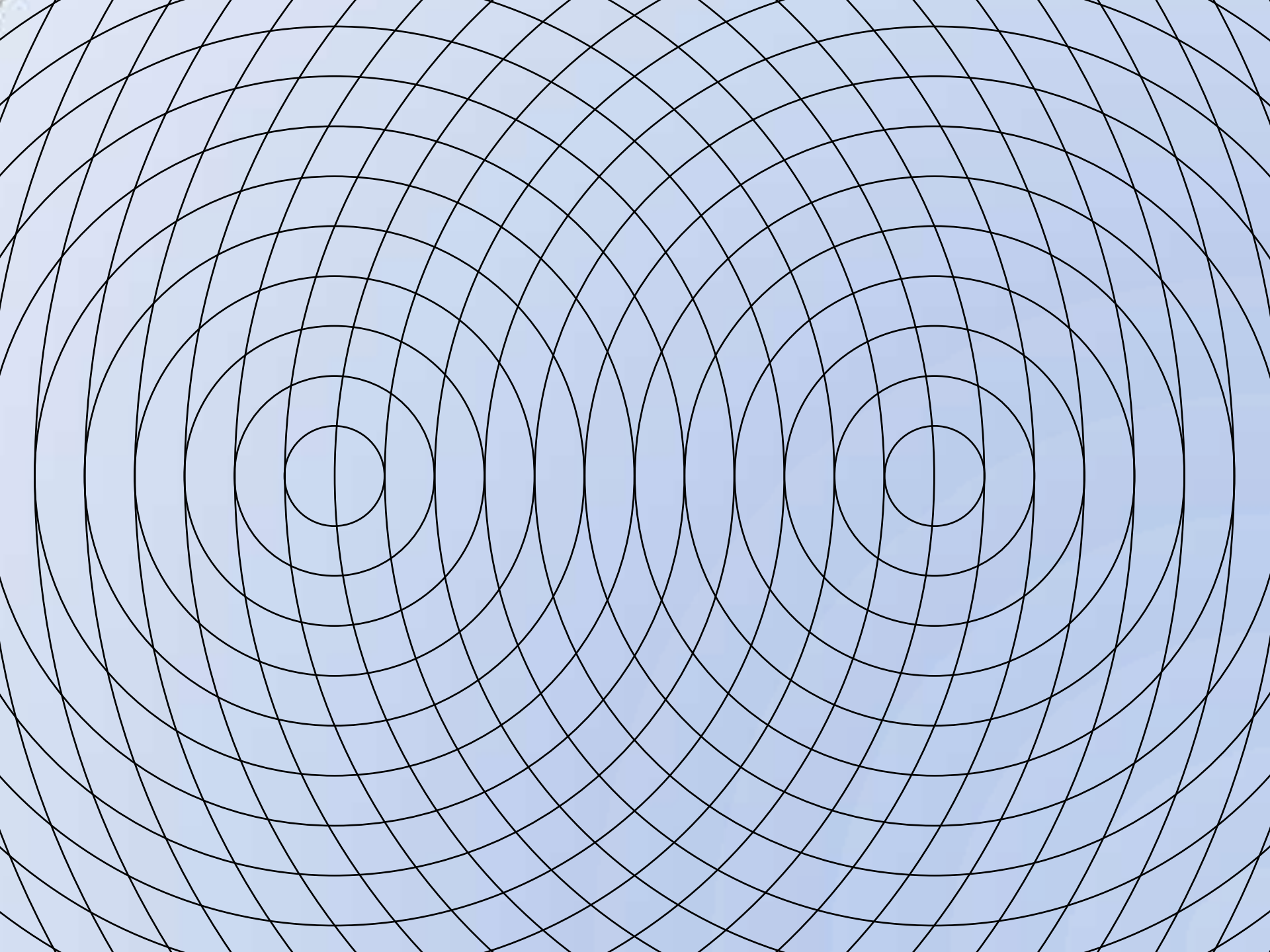
Do you speak mathematics?

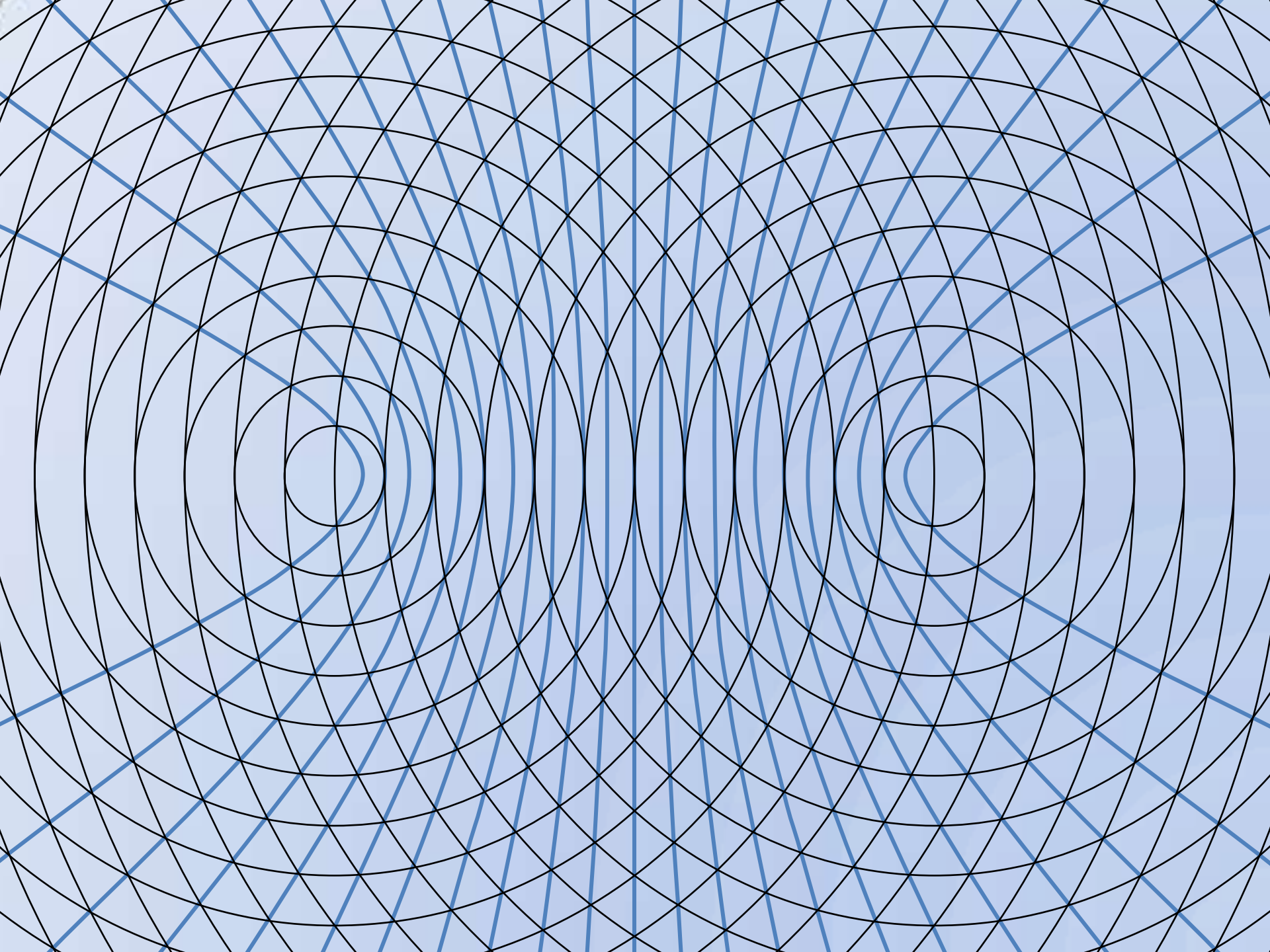

Curves

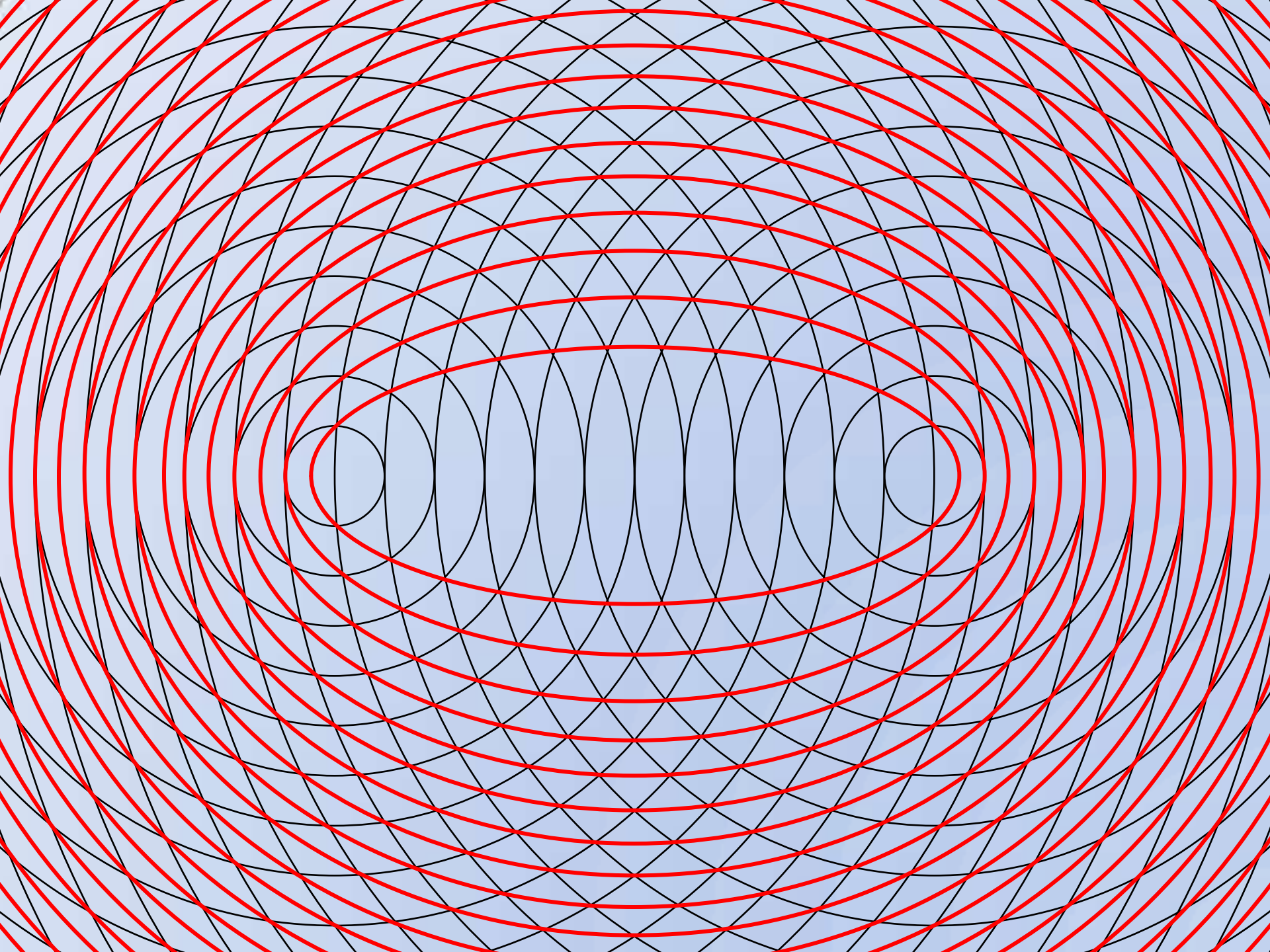


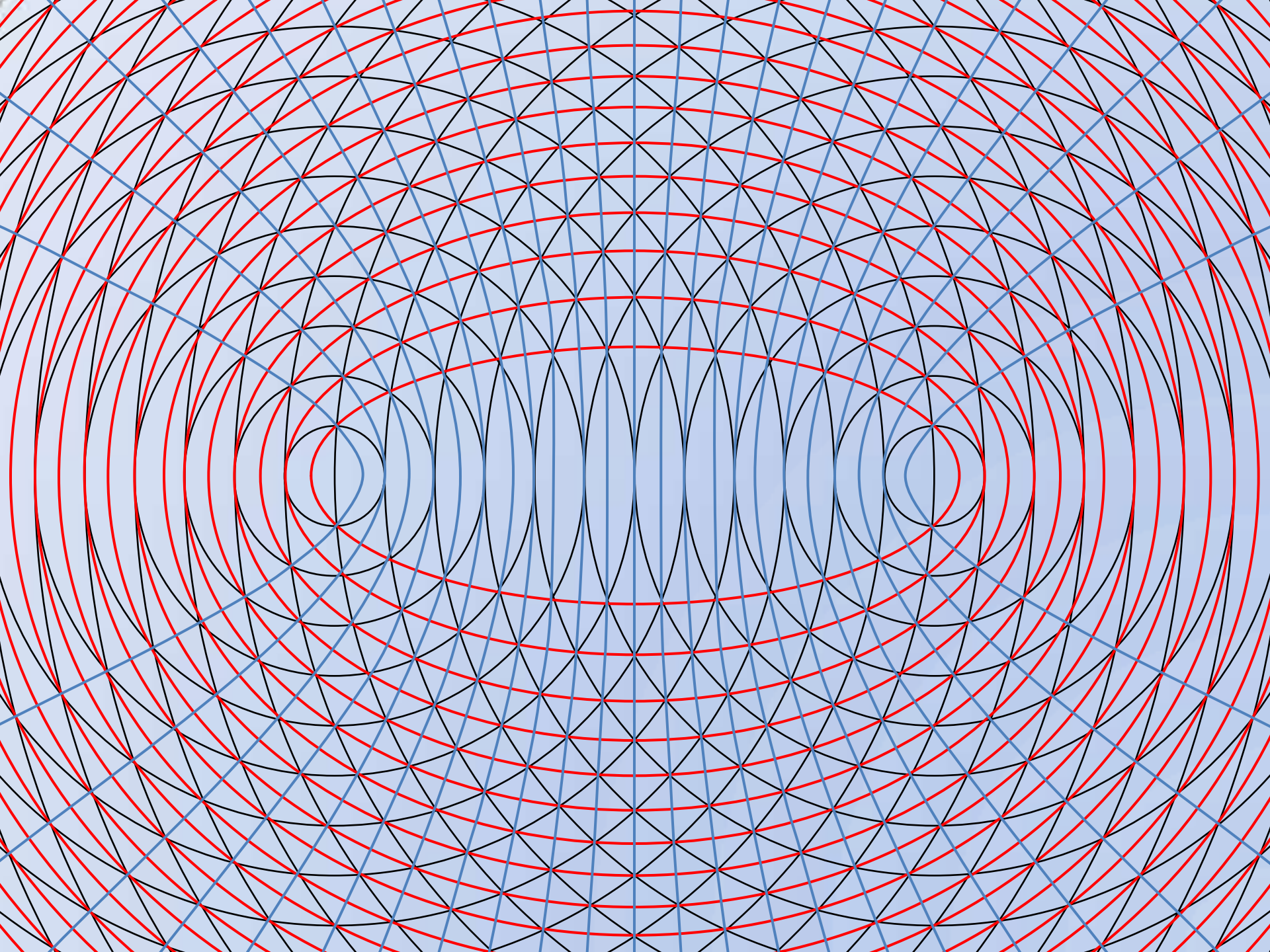












HARLEM

Olny srmat poelpe can…

Cdnuolt blveiee taht I cluod aulaclty uesdnatnrd waht I was rdanieg. The phaonmneal pweor of the hmuan mnid, aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoatnt tihng is taht the frist and lsat ltteer be in the rghit pclae. The rset can be a taotl mses and you can sitll raed it wouthit a porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

Amzanig huh?

Yaeh, and I awlyas tghuhot slpeling was ipmorantt!

Language is:

- *a systematic means of communicating by the use of sounds or conventional symbols*
- *a system of words used in a particular discipline*
- *the code we all use to express ourselves and communicate to others*
- *a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements.*

Do you speak mathematics?

"My own attitude, which I share with many of my colleagues, is simply that mathematics is a language. Like English, or Latin, or Chinese, there are certain concepts for which mathematics is particularly well suited: it would be as foolish to attempt to write a love poem in the language of mathematics as to prove the Fundamental Theorem of Algebra using the English language."

- ***R. L. E. Schwarzenberger***

Do you speak mathematics?