

MATH

and shapes

with Kyle Ormsby
(Irving's dad)

What is math?

guess answers challenging

symbols $\times, +, =, -, \div$

numbers 1, 2, 3, ..., ∞ , 100

shapes Δ , $\square$, 

patterns 

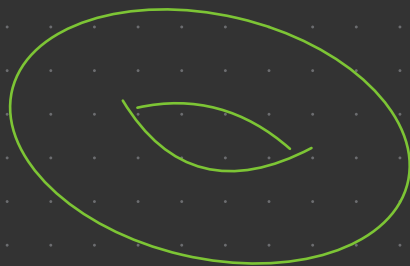
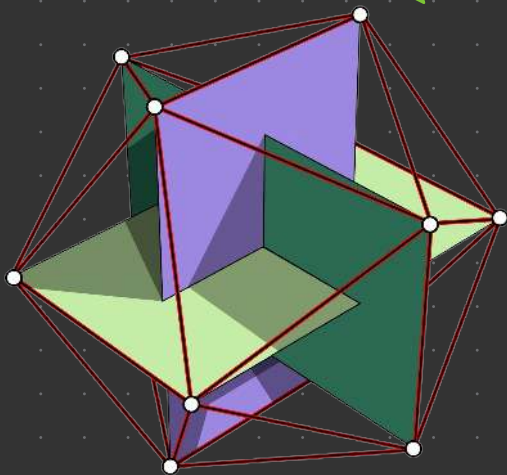
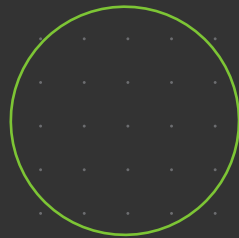
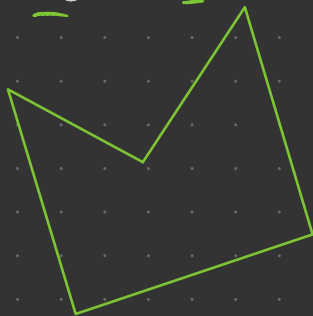
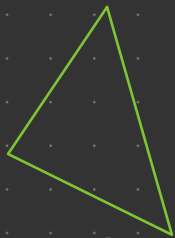
What is a mathematician?

Person who does math.

Who is a mathematician?

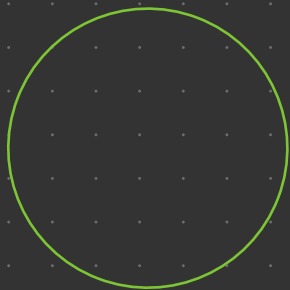


What is a shape?

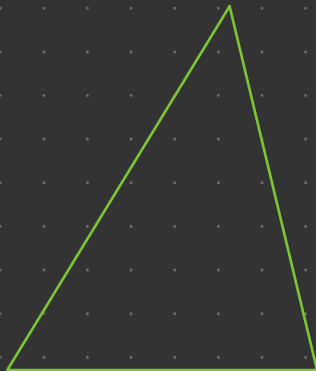


Flat Shapes

2-D



circle

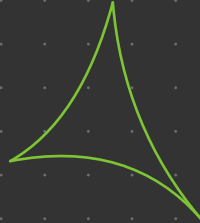
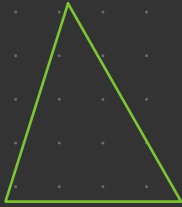


triangle

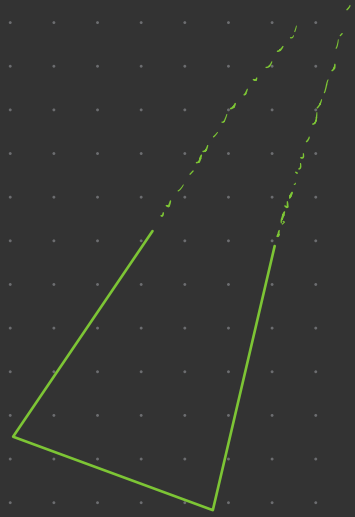


rectangle

Triangles



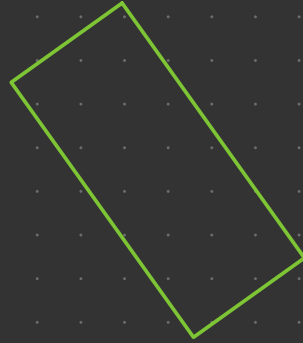
sides not
straight



sides do not
meet

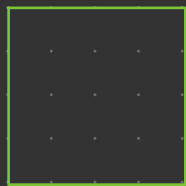


Rectangles



- 4 sides
- 4 corners

Are squares rectangles?



Yes —

squares have
4 sides

and all sides same
length

L corners

More sides

sides

name

examples

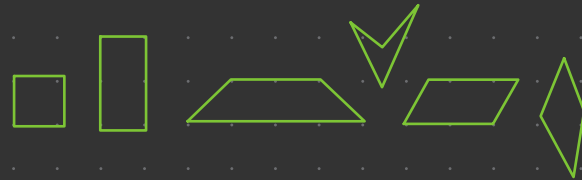
3

triangle



4

quadrilateral



5

pentagon

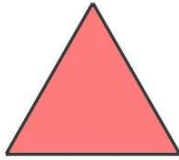


6

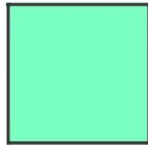
hexagon



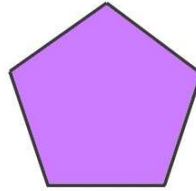
Regular Polygons



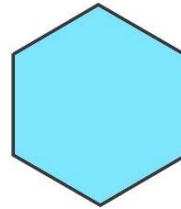
Triangle



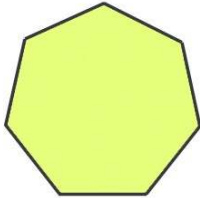
Quadrilateral



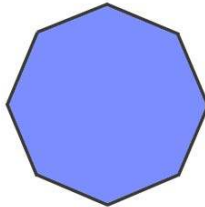
Pentagon



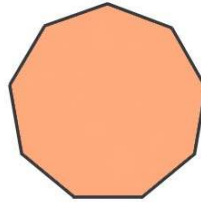
Hexagon



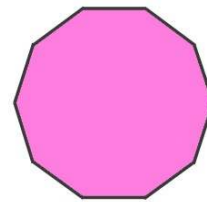
Heptagon



Octagon



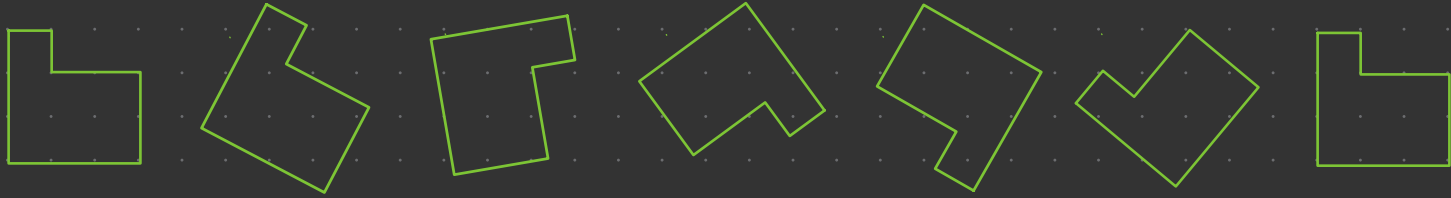
Nonagon



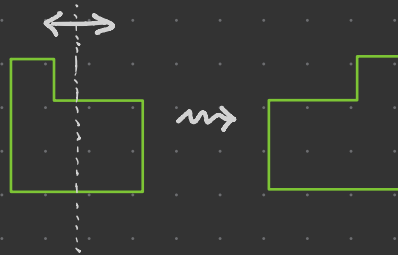
Decagon

equal sides, equal angles

When are shapes "the same"?

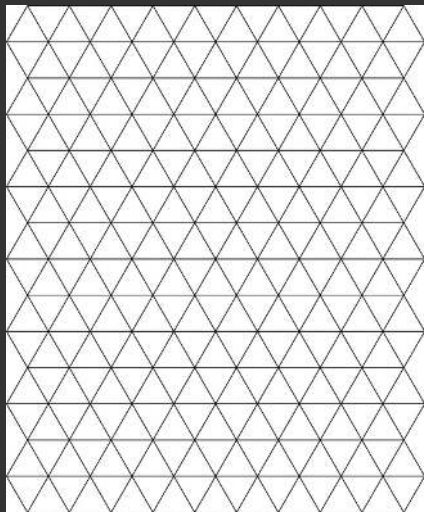


Rotation

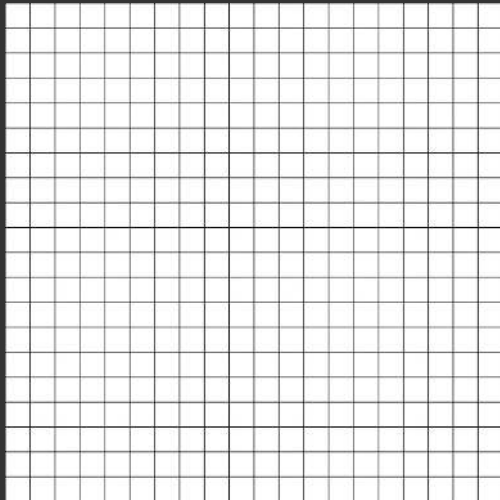


Reflection

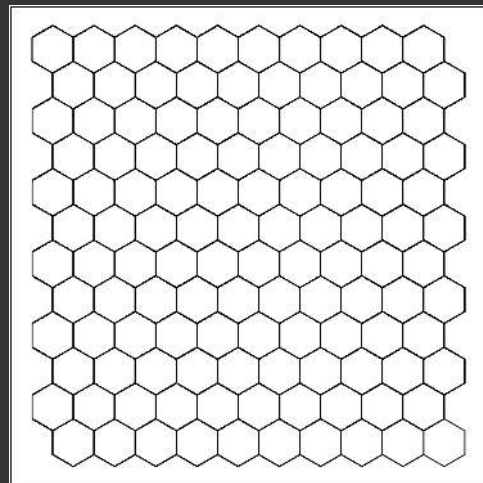
Tiling



regular
triangles

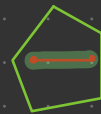


regular
squares

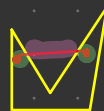


regular
hexagons

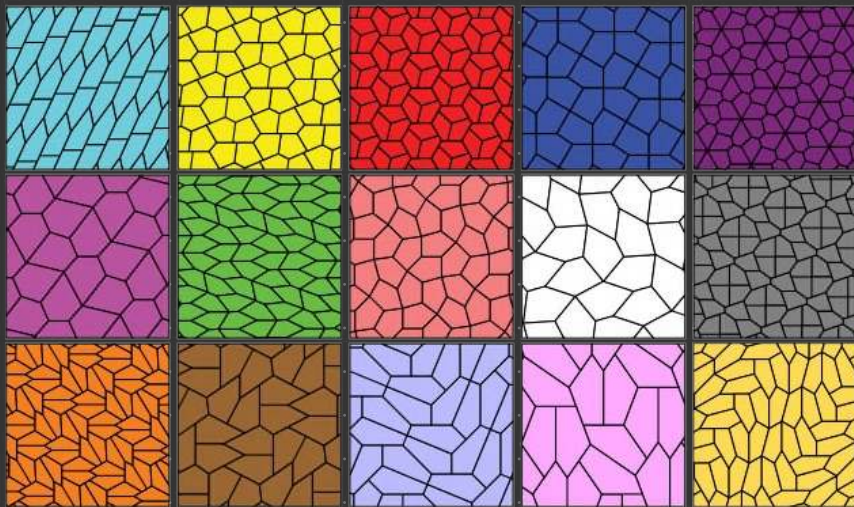
Pentagonal Tilings



convex



not
convex.



Exactly 15 convex pentagon shapes
tile the plane (2017)



Marjorie
Rice



Michaël
Rao

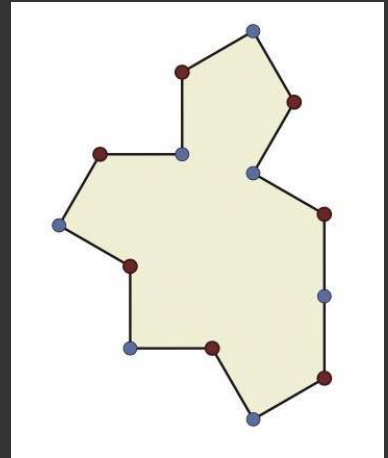
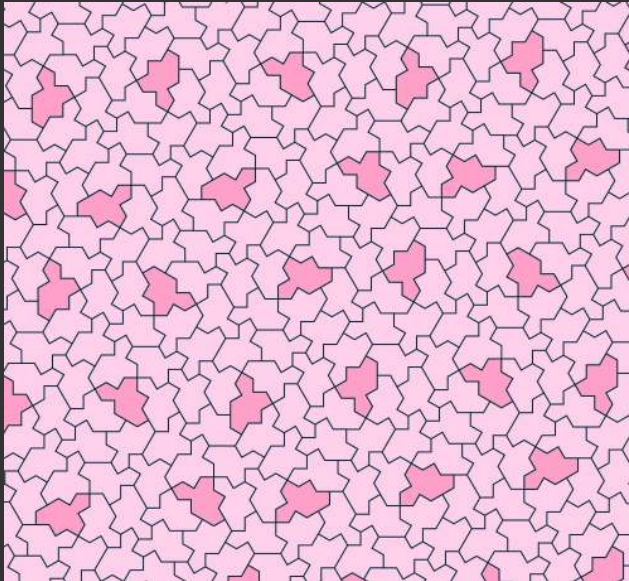
(chiral)

Aperiodic Monotiles

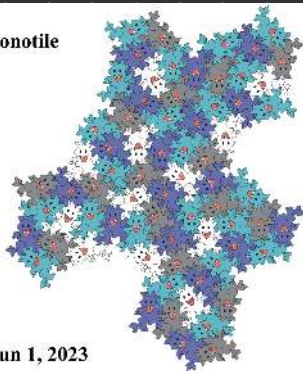
DISCOVERED 4 DAYS AGO!

Smith-Myers-
Kaplan

Goodman-Strauss

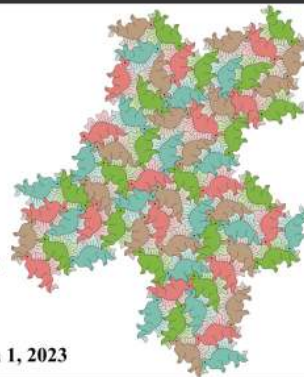
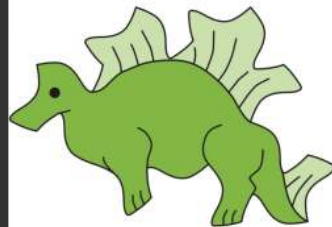


The Spectre: Chiral Aperiodic Monotile



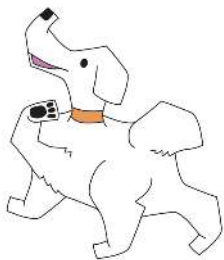
yoshiaki.araki@tessellation.jp Jun 1, 2023

Chiral Aperiodic Dino



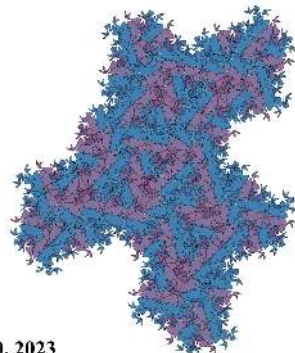
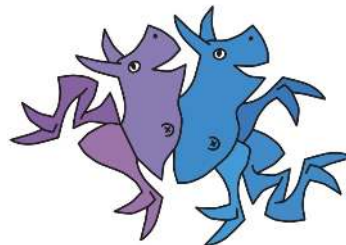
yoshiaki.araki@tessellation.jp Jun 1, 2023

Chiral Aperiodic Dog



yoshiaki.araki@tessellation.jp May 31, 2023

Chiral Aperiodic Twinhead Pig



yoshiaki.araki@tessellation.jp May 30, 2023

MATH:

- lots to learn
- even more to invent/discover