

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 

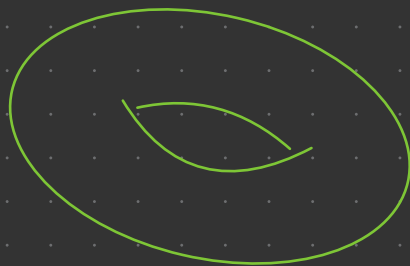
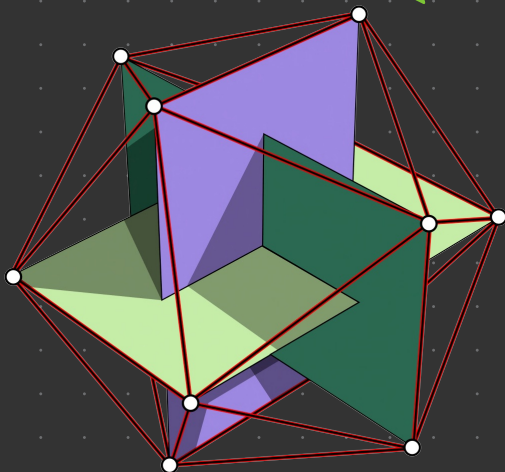
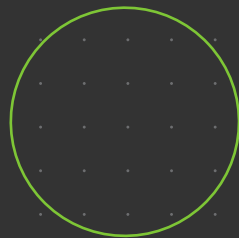
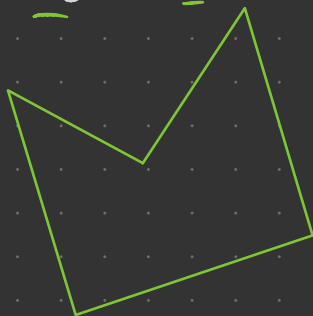
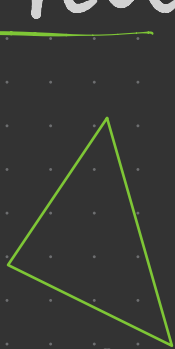
What is a mathematician?

Person who does math.

Who is a mathematician?

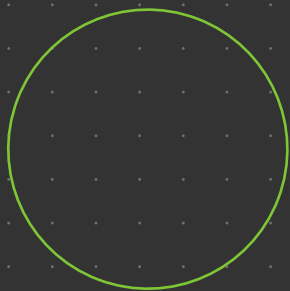


What is a shape?

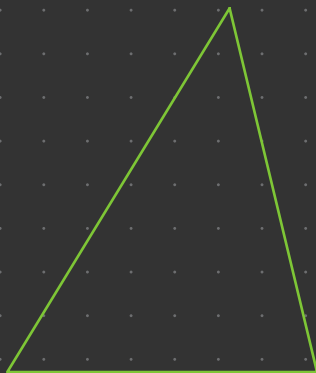


Flat Shapes

2-D



circle

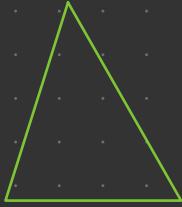


triangle

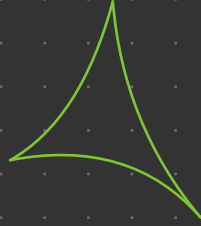


rectangle

Triangles

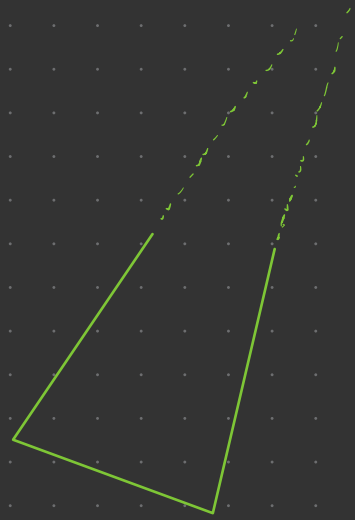


✓



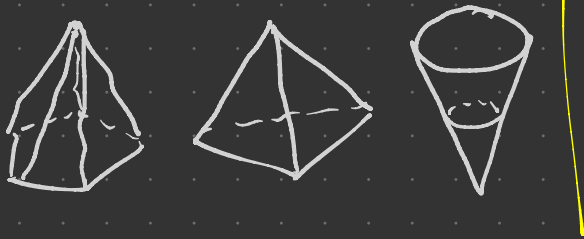
×

sides not straight

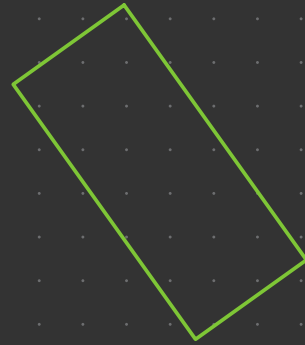


×

sides do not meet

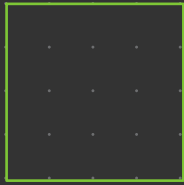


Rectangles



- 4 sides
- L corners

Are squares rectangles?



Yes —

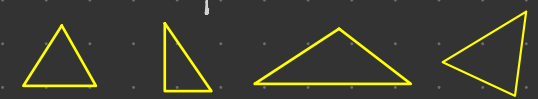
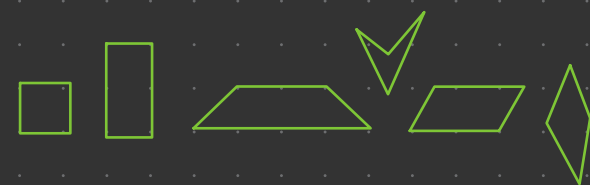


squares have

4 sides

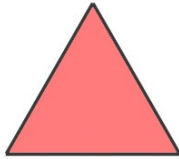
L corners

and all sides same
length

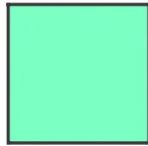
More sides

<u>sides</u>	<u>name</u>	<u>examples</u>
3	triangle	
4	quadrilateral	
5	pentagon	
6	hexagon	

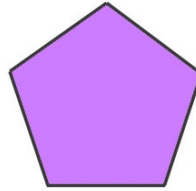
Regular Polygons



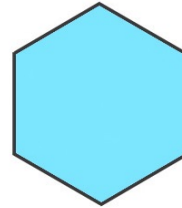
Triangle



Quadrilateral



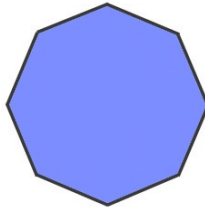
Pentagon



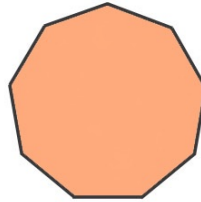
Hexagon



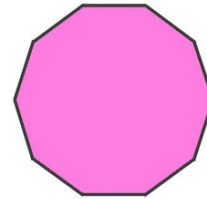
Heptagon



Octagon



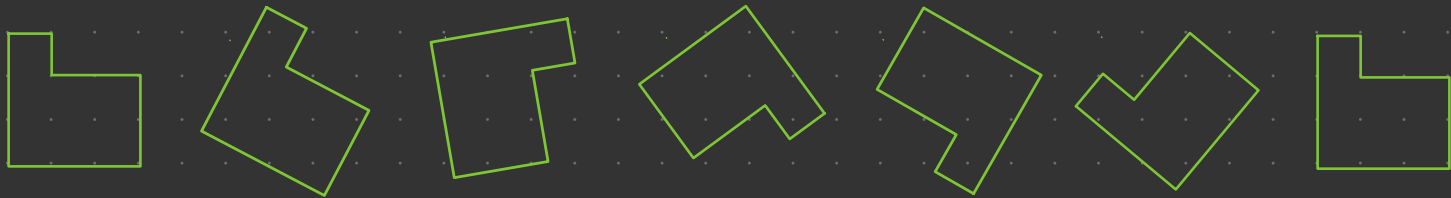
Nonagon



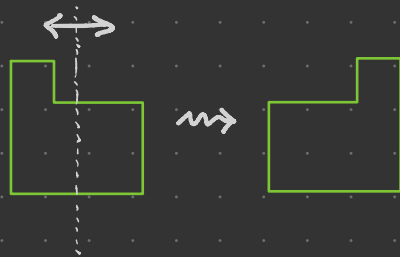
Decagon

equal sides, equal angles

When are shapes "the same"?

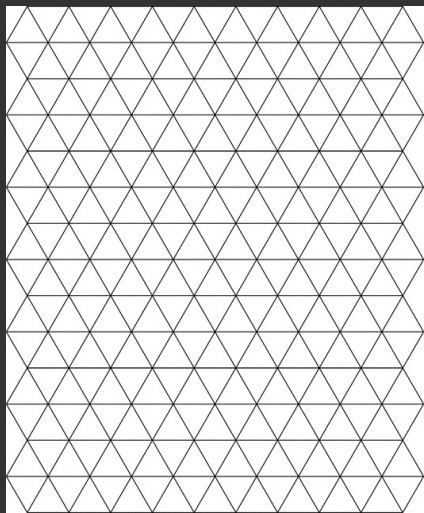


Rotation

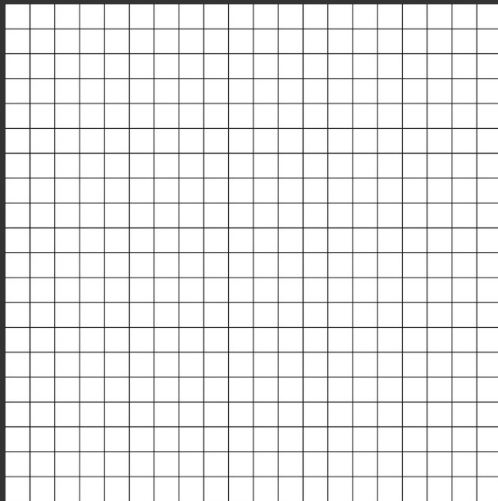


Reflection

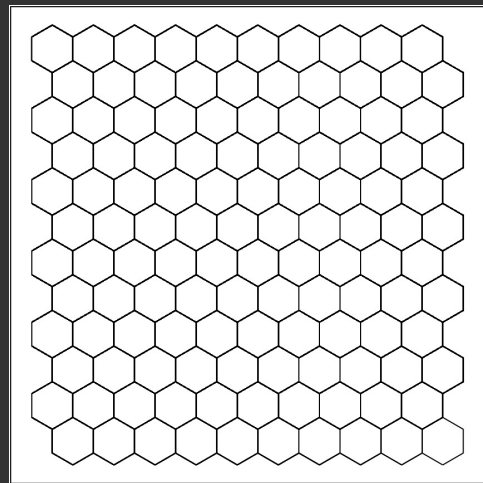
Tiling



regular
triangles

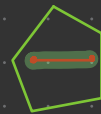


regular
squares

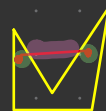


regular
hexagons

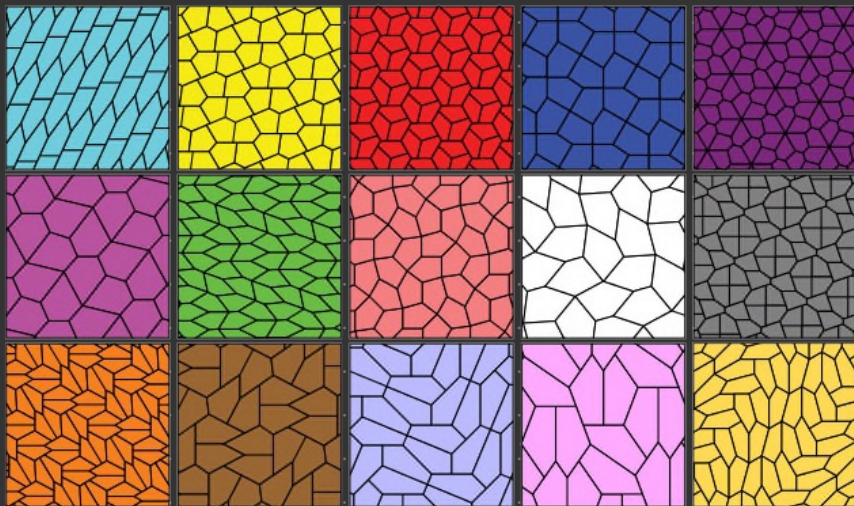
Pentagonal Tilings



convex



not
convex.



Exactly 15 convex pentagon shapes
tile the plane (2017)



Marjorie
Rice

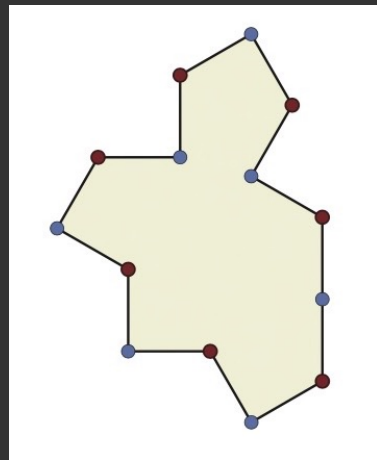
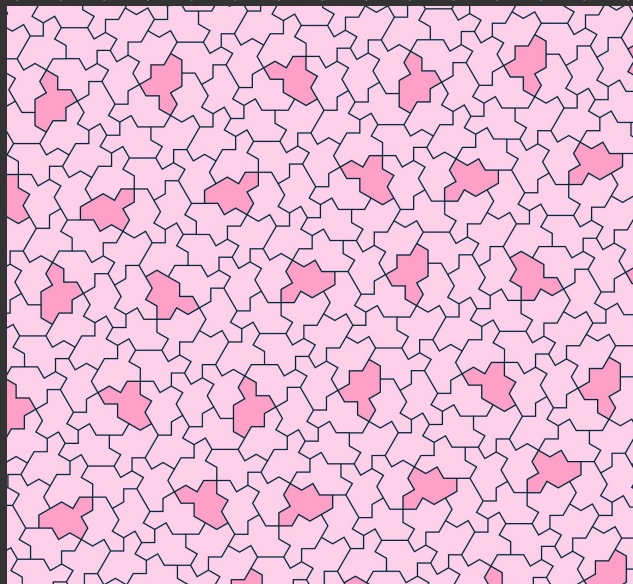


Michael
Rao

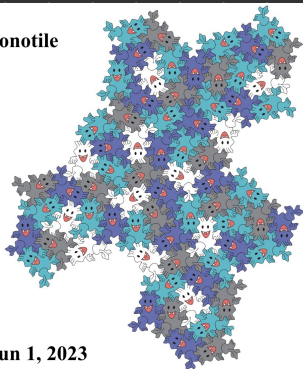
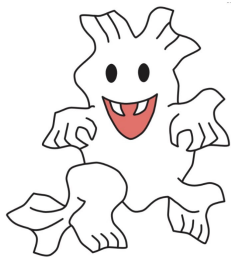
(chiral)

Aperiodic Monotiles

DISCOVERED 4 DAYS AGO! Smith-Myers-
Kaplan-
Goodman-Strauss

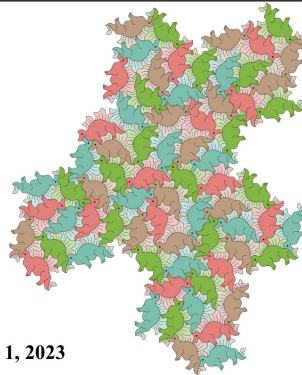
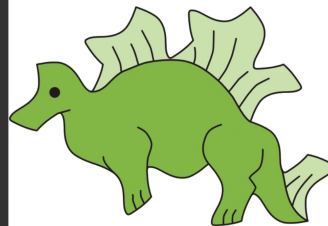


The Spectre: Chiral Aperiodic Monotile



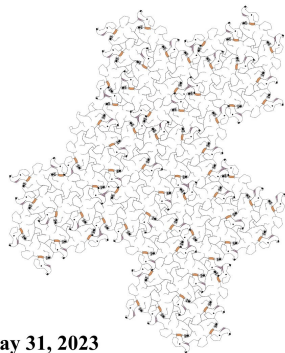
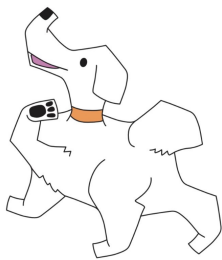
yoshiaki.araki@tessellation.jp Jun 1, 2023

Chiral Aperiodic Dino



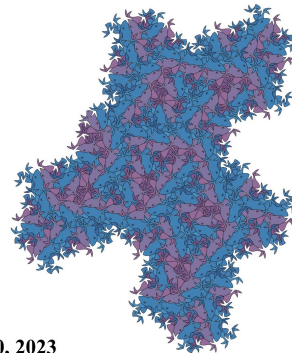
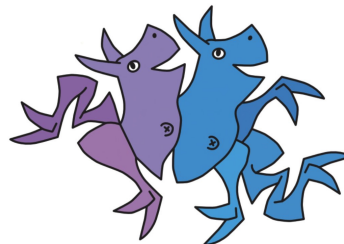
yoshiaki.araki@tessellation.jp Jun 1, 2023

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