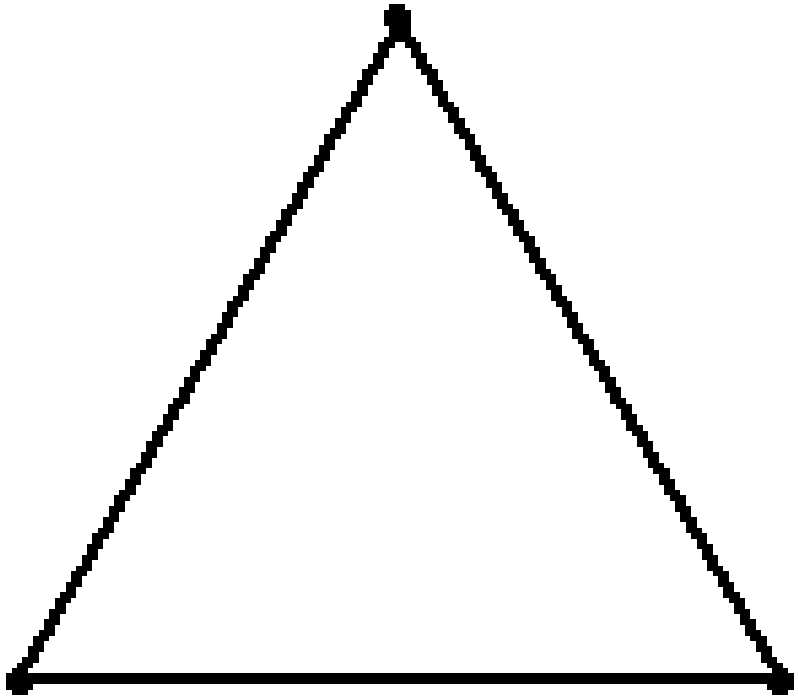
The predatory bugs problem….

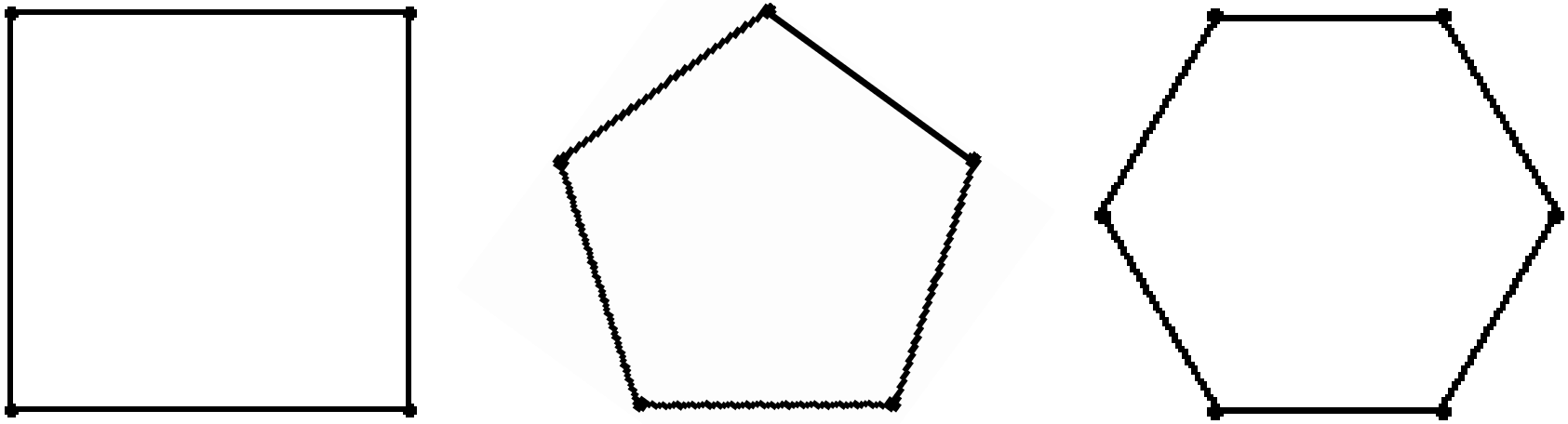
Three predatory bugs are initially sitting at the corners of an equilateral triangle. All at once, each of the bugs begin crawling with equal speed directly toward the bug on their right.

What is the path of each bug?

Demonstration of the pursuit paths of predatory bugs:

http://www.hellam.net/pursuit.html





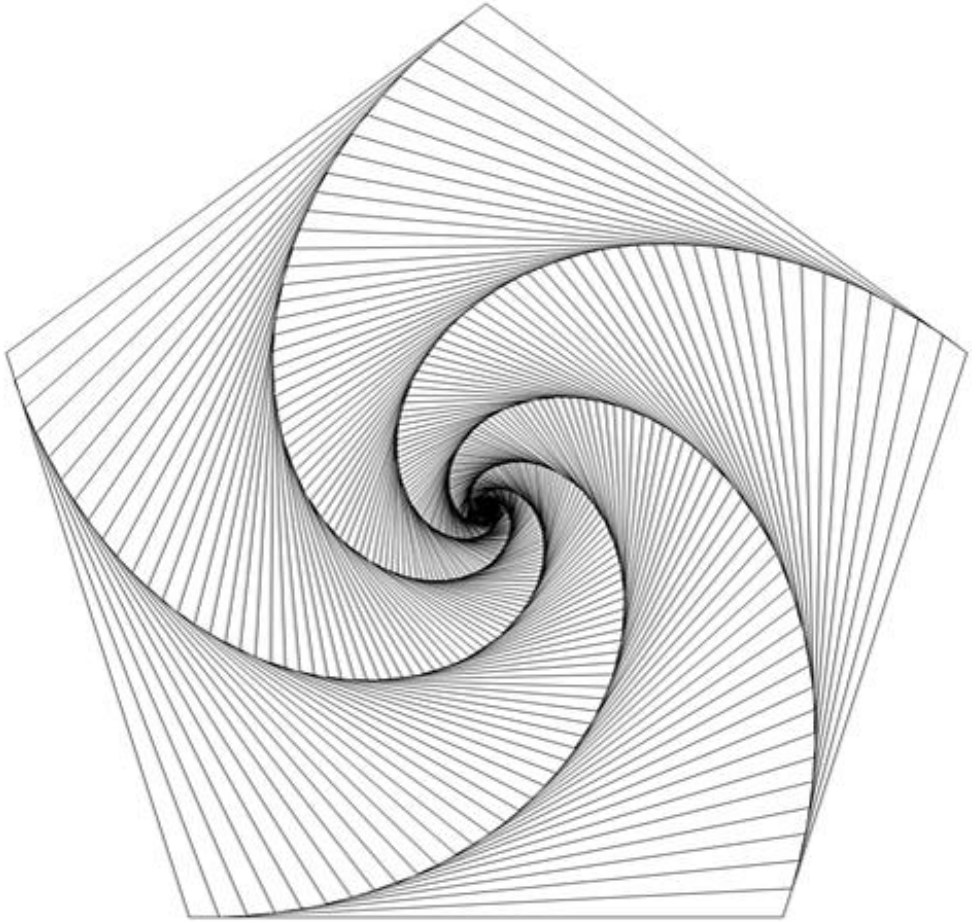
The curves made by the bugs' tracks are called 'whirls'.

If we plotted the bugs' 'sightlines' at regular intervals, what might the results look like?

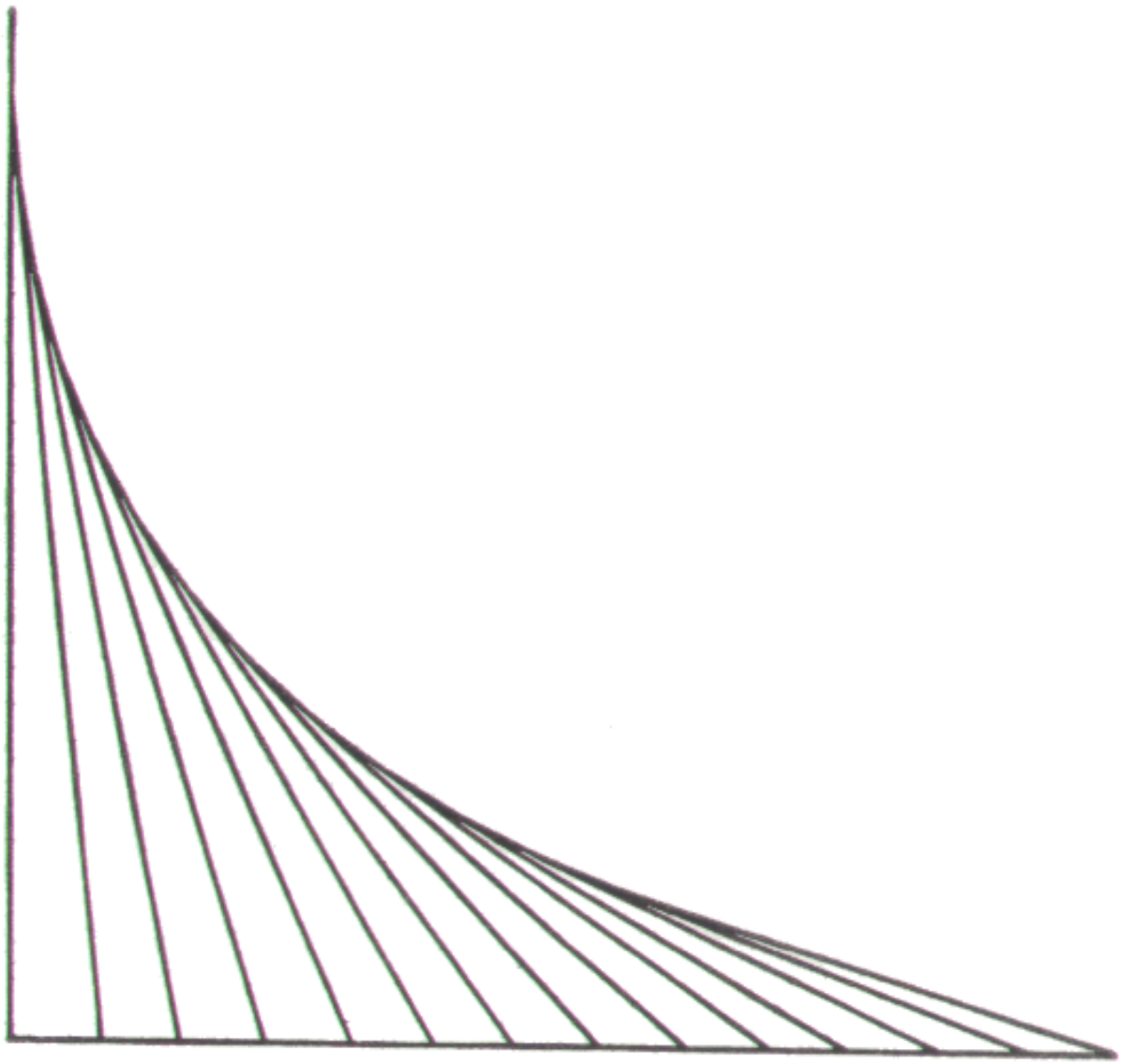
Weisstein, Eric W. "Mice Problem." From *MathWorld*--A Wolfram Web Resource. http://mathworld.wolfram.com/MiceProblem.html

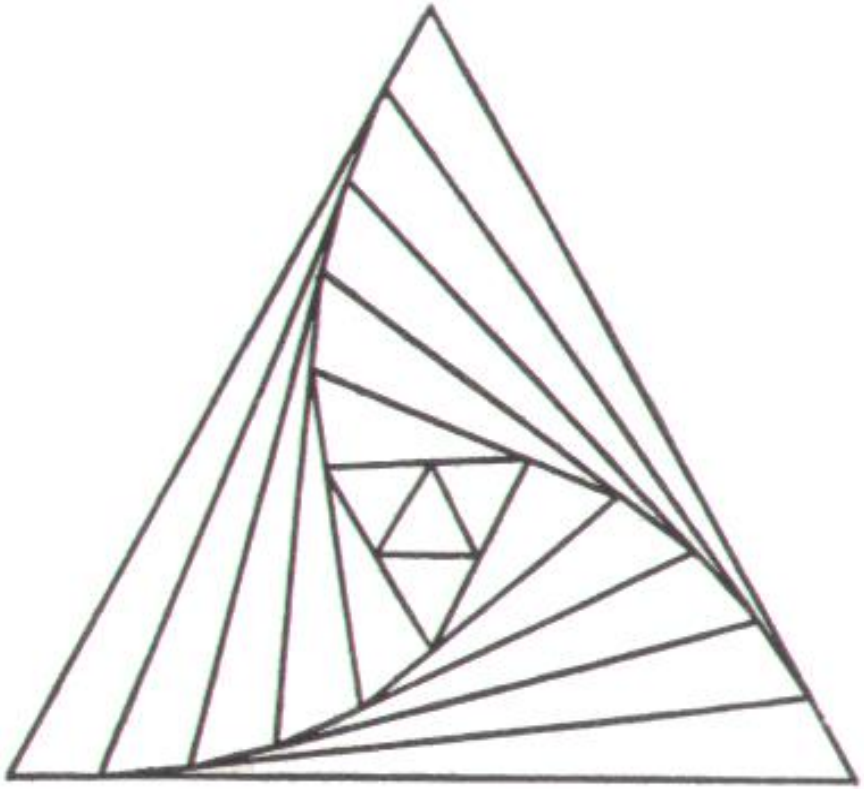
Source: Daniel Walsh

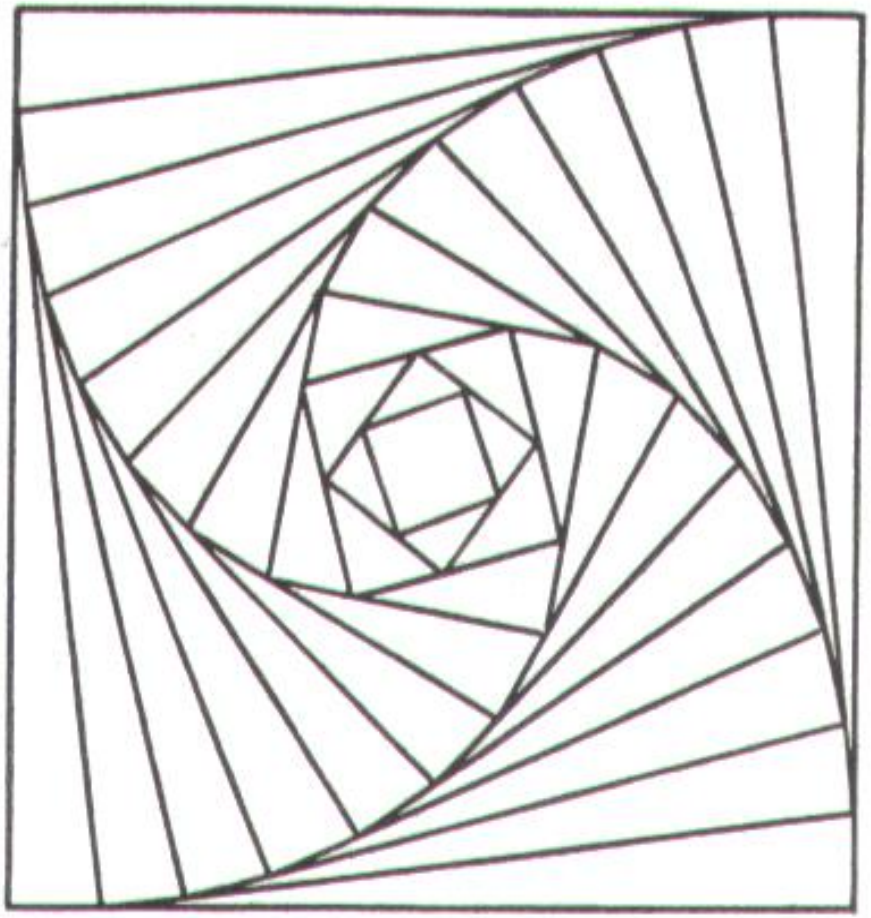
Curves of Pursuit

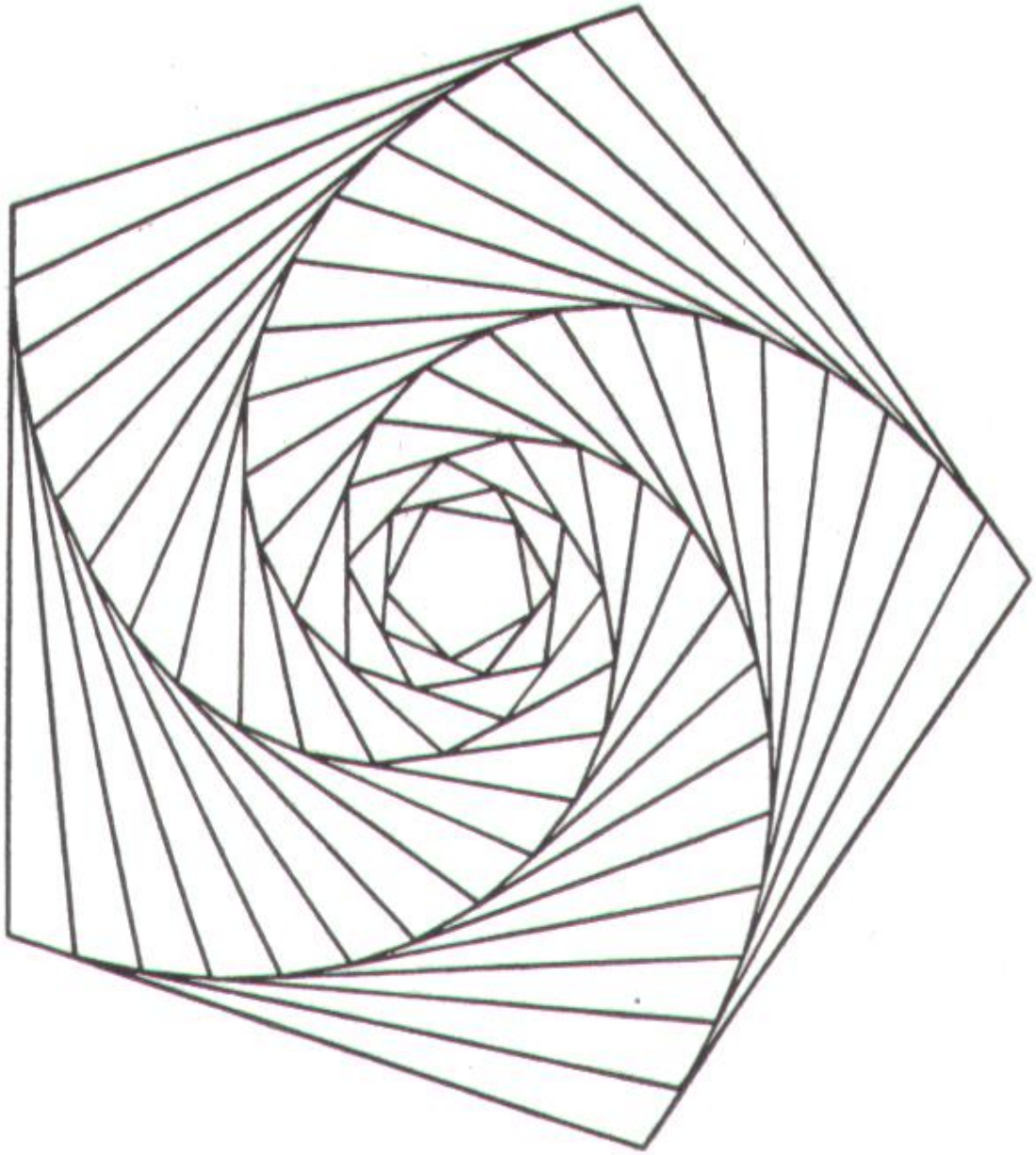


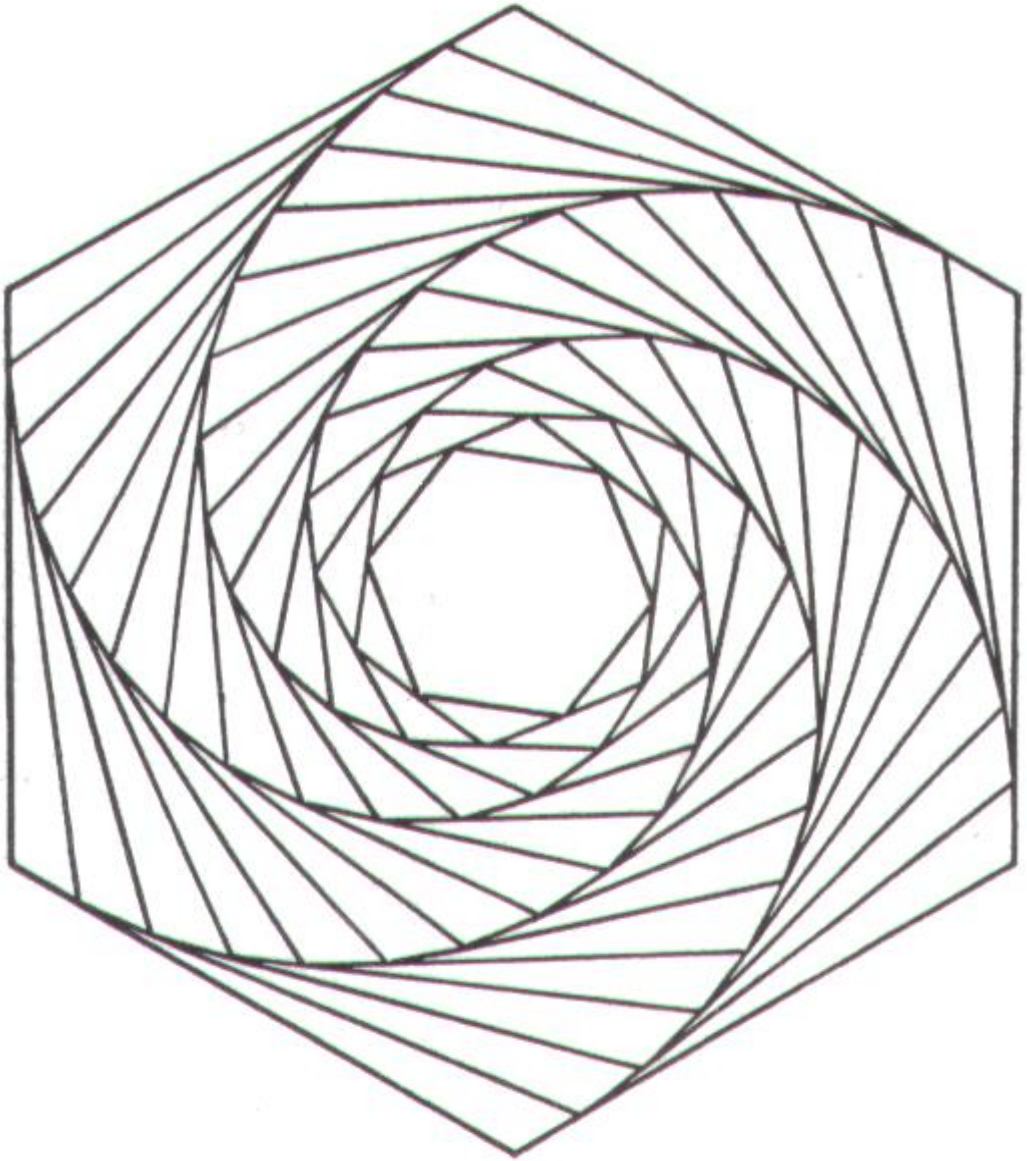
Source: Devan Matthews, Excelmathart, Tumblr

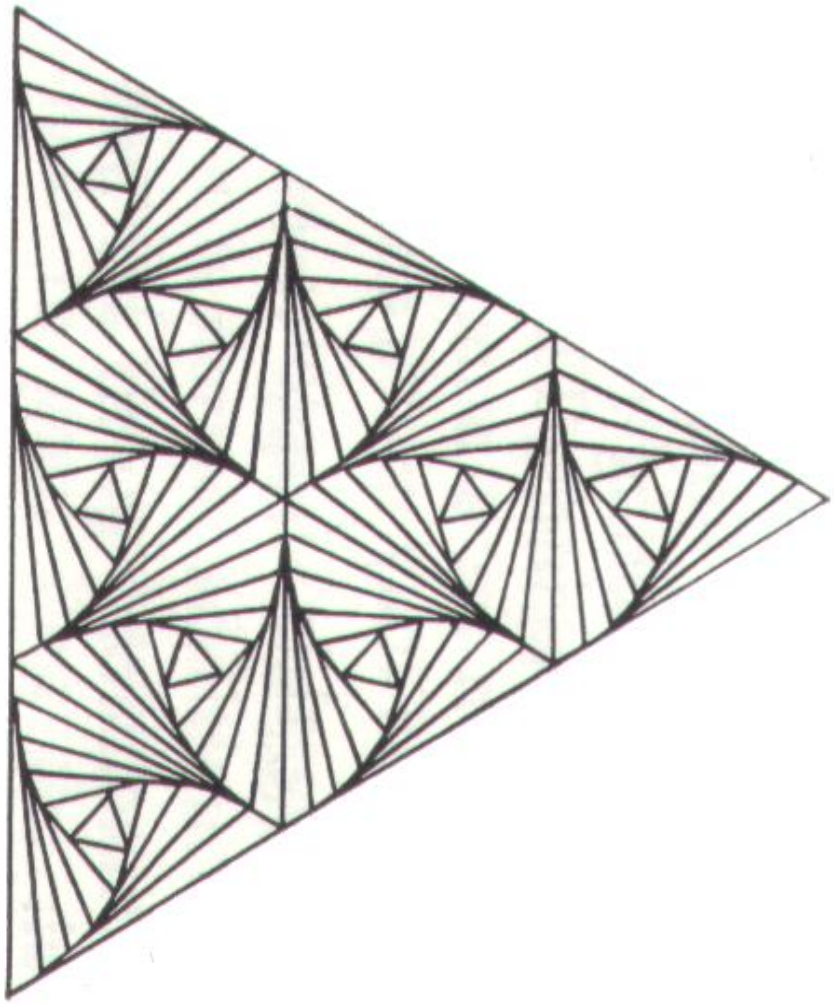


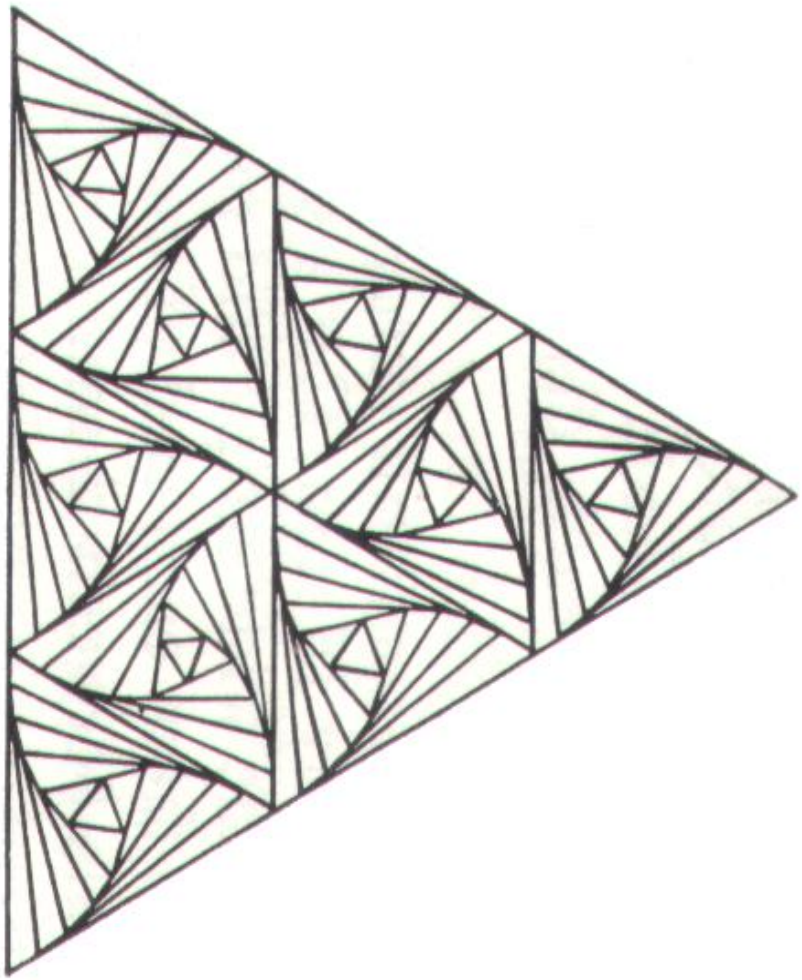


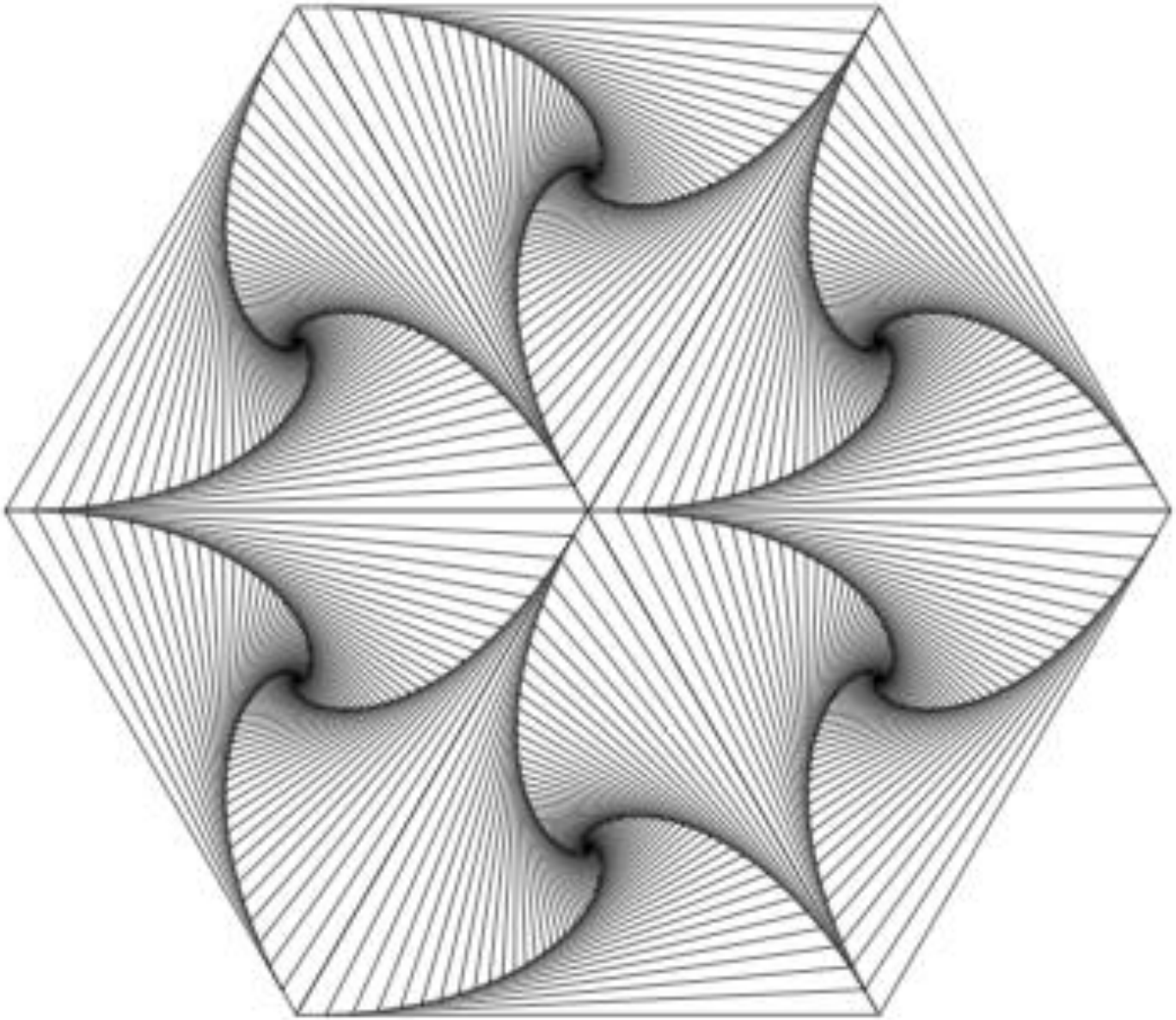




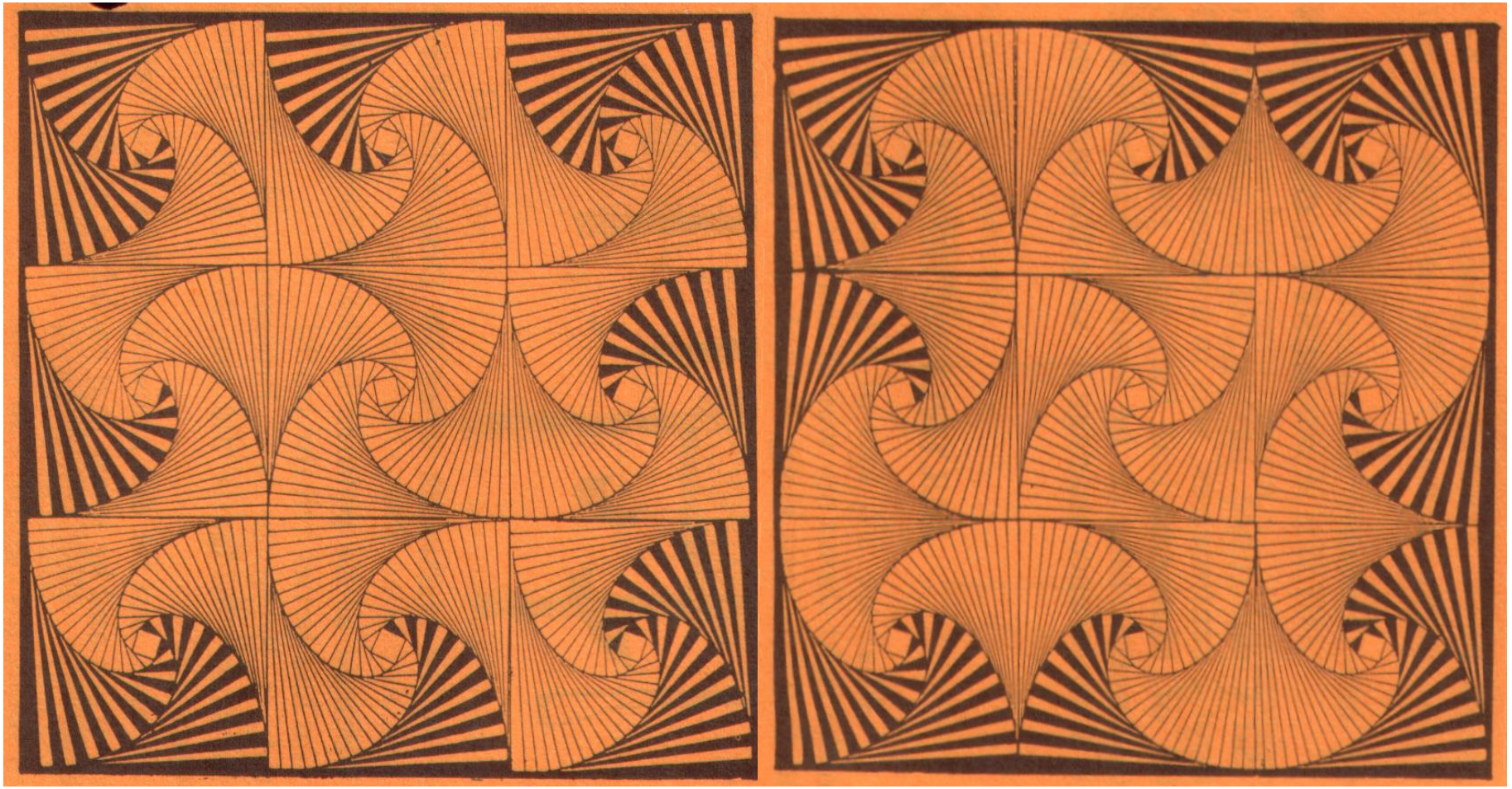








Source: Daniel Walsh



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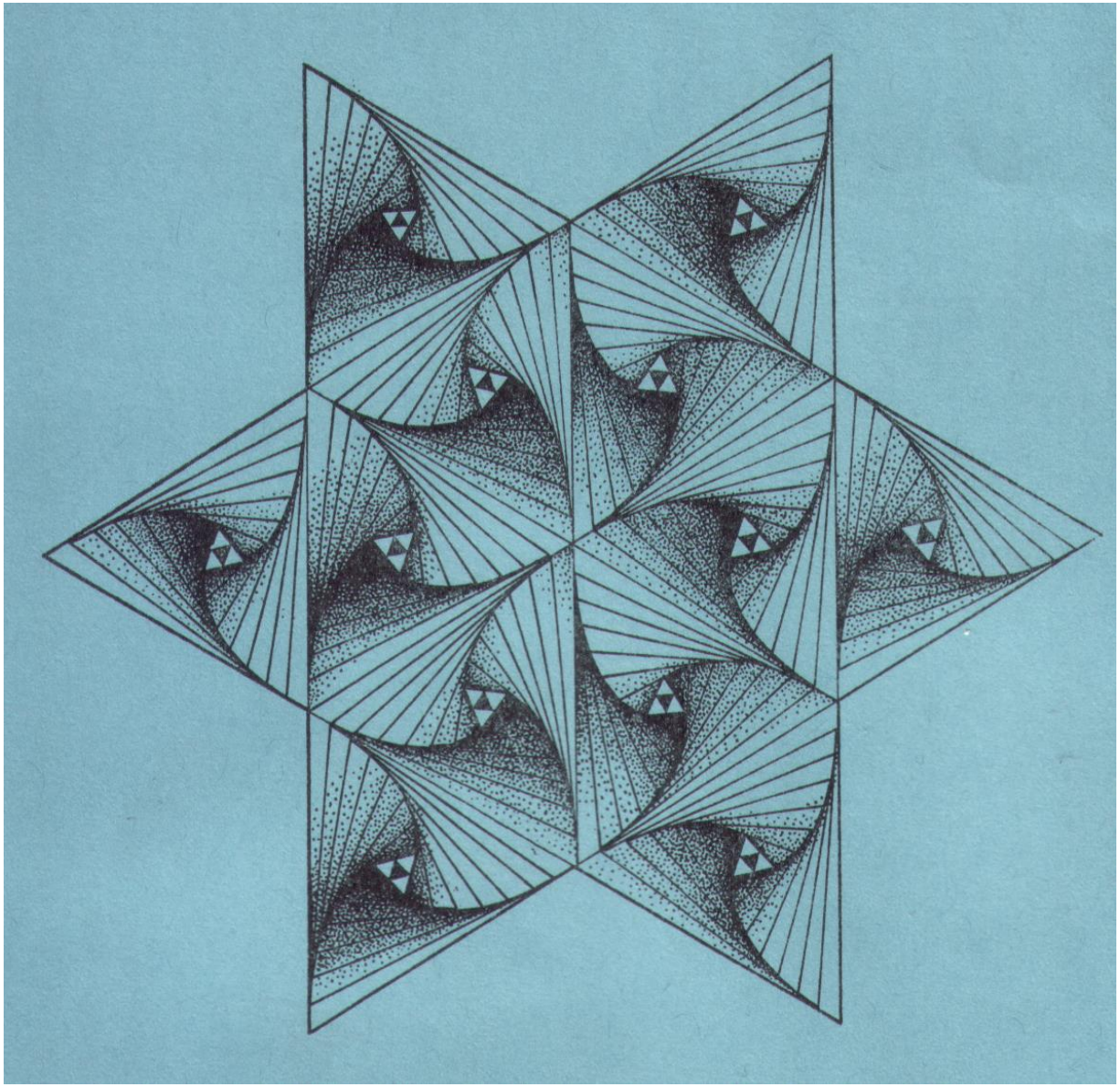

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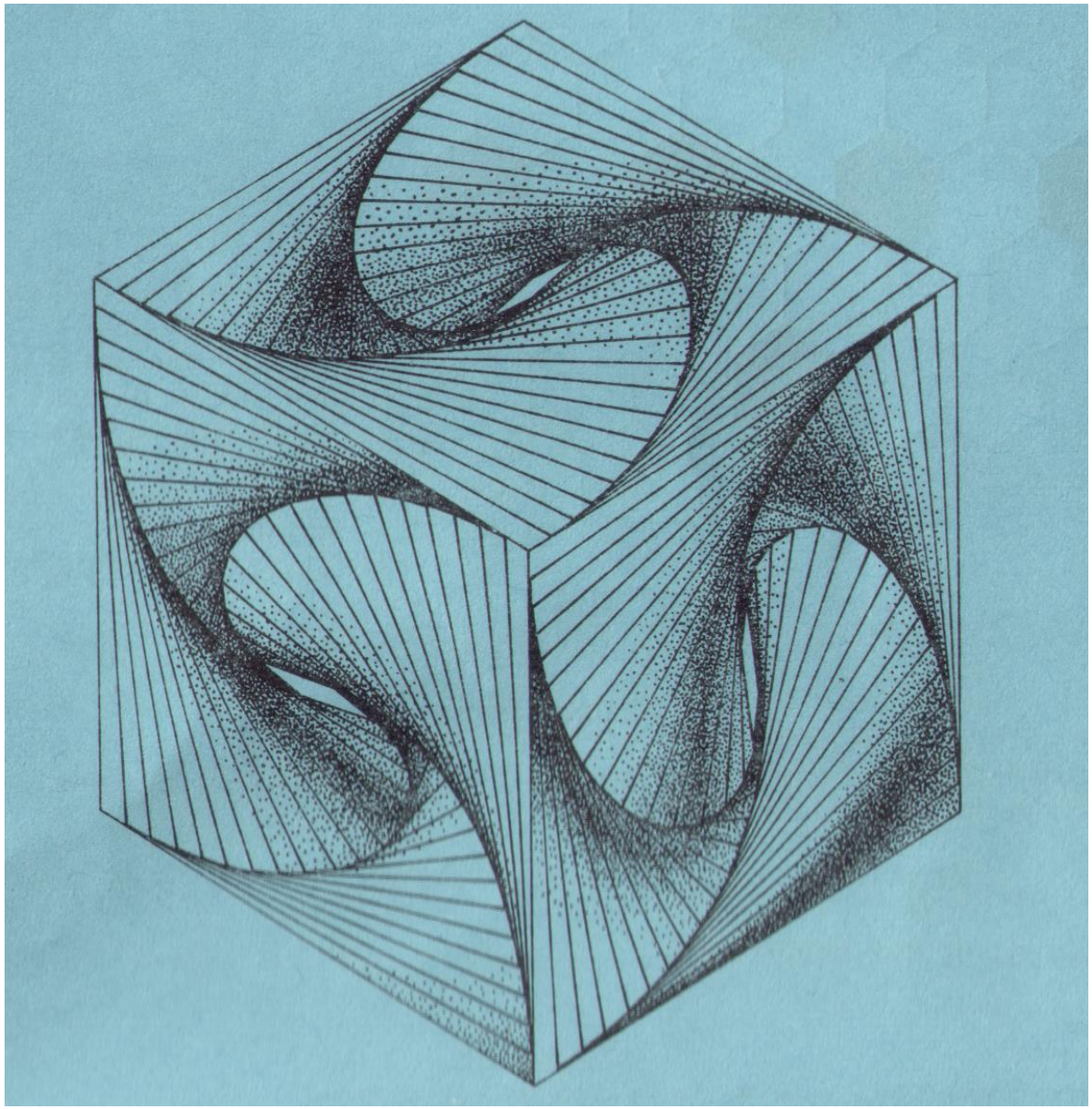

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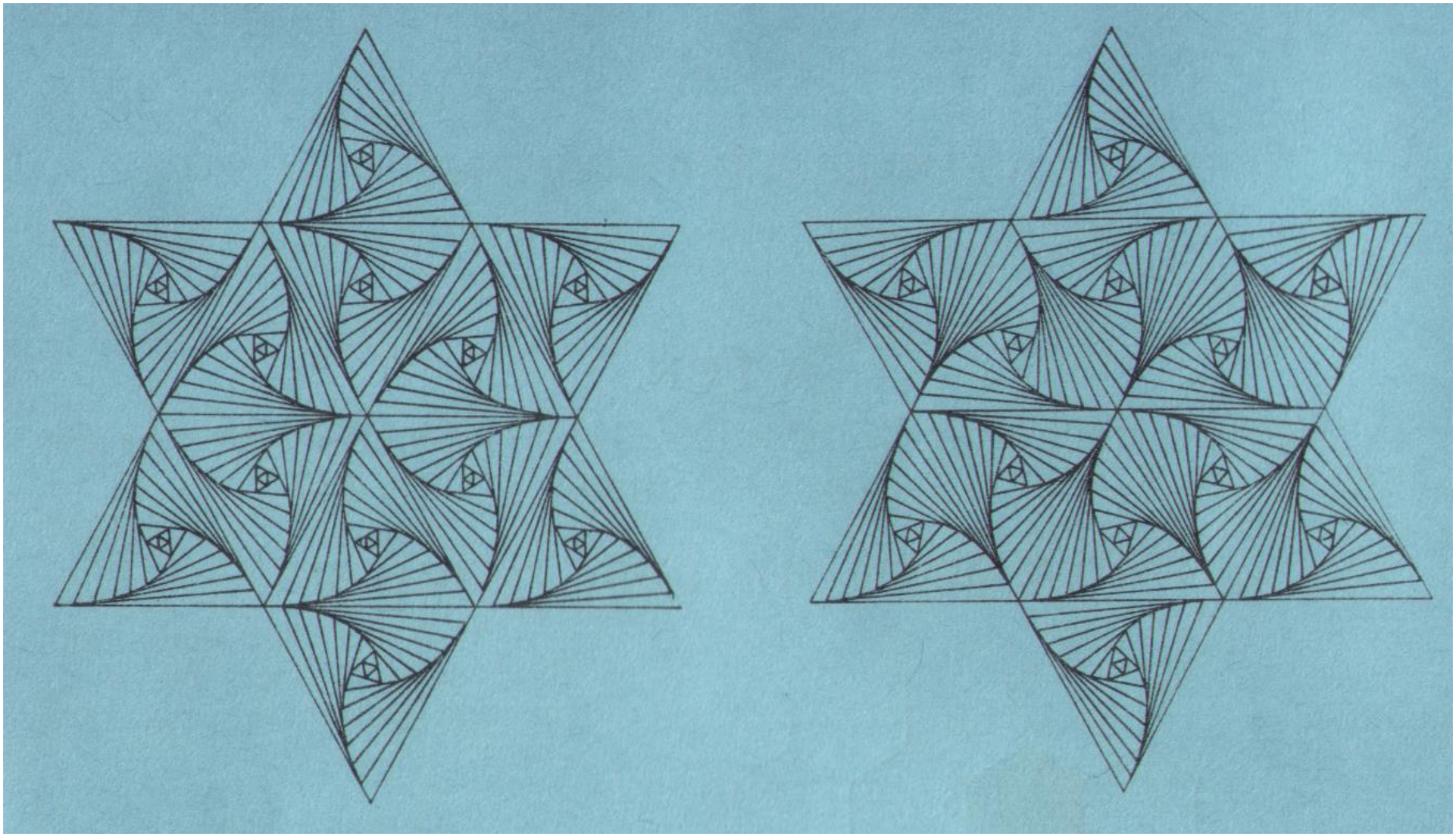

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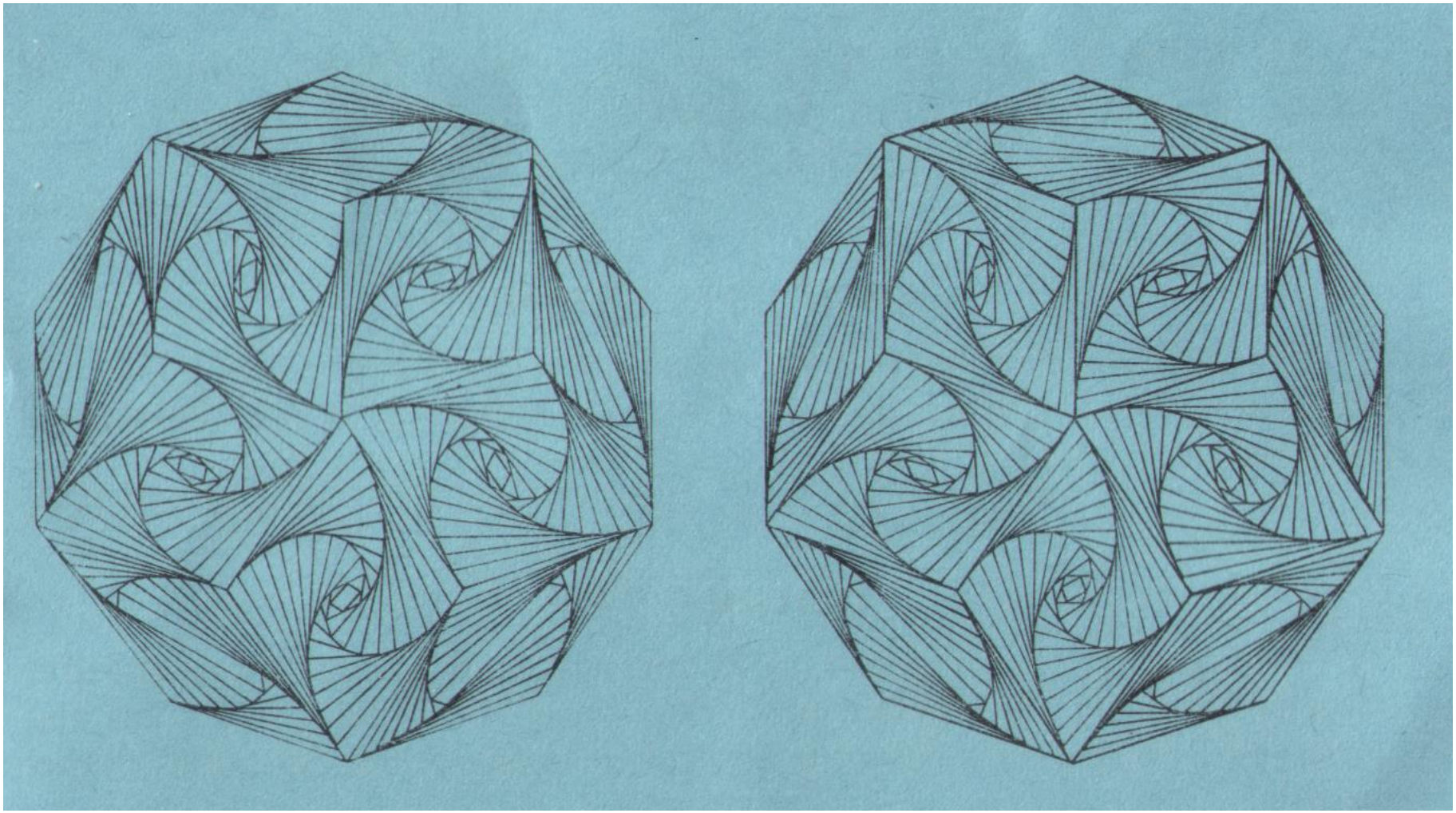


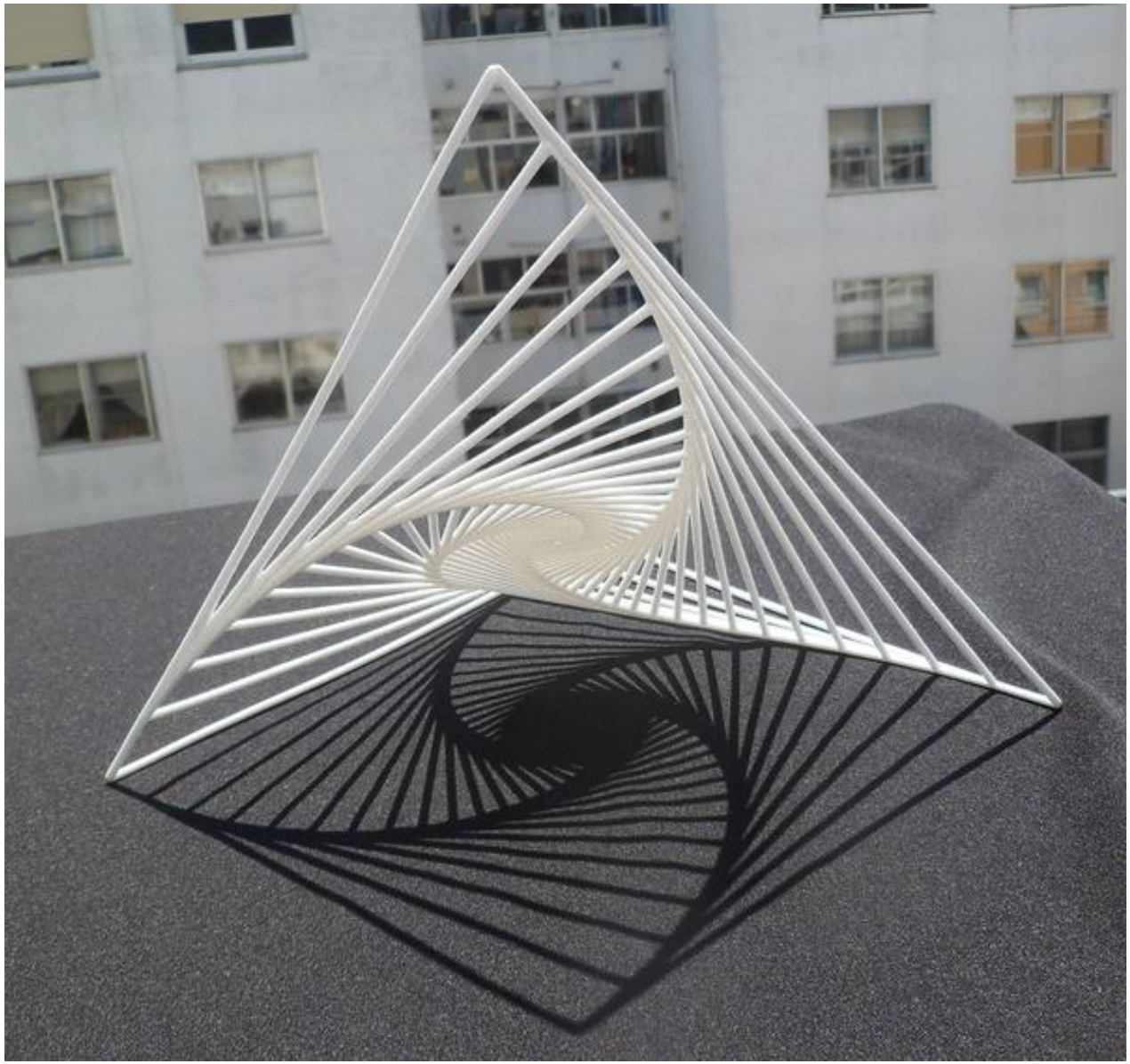
Source unknown

Tape Installation at the Wexner Centre for the Arts, by Megan Geckler

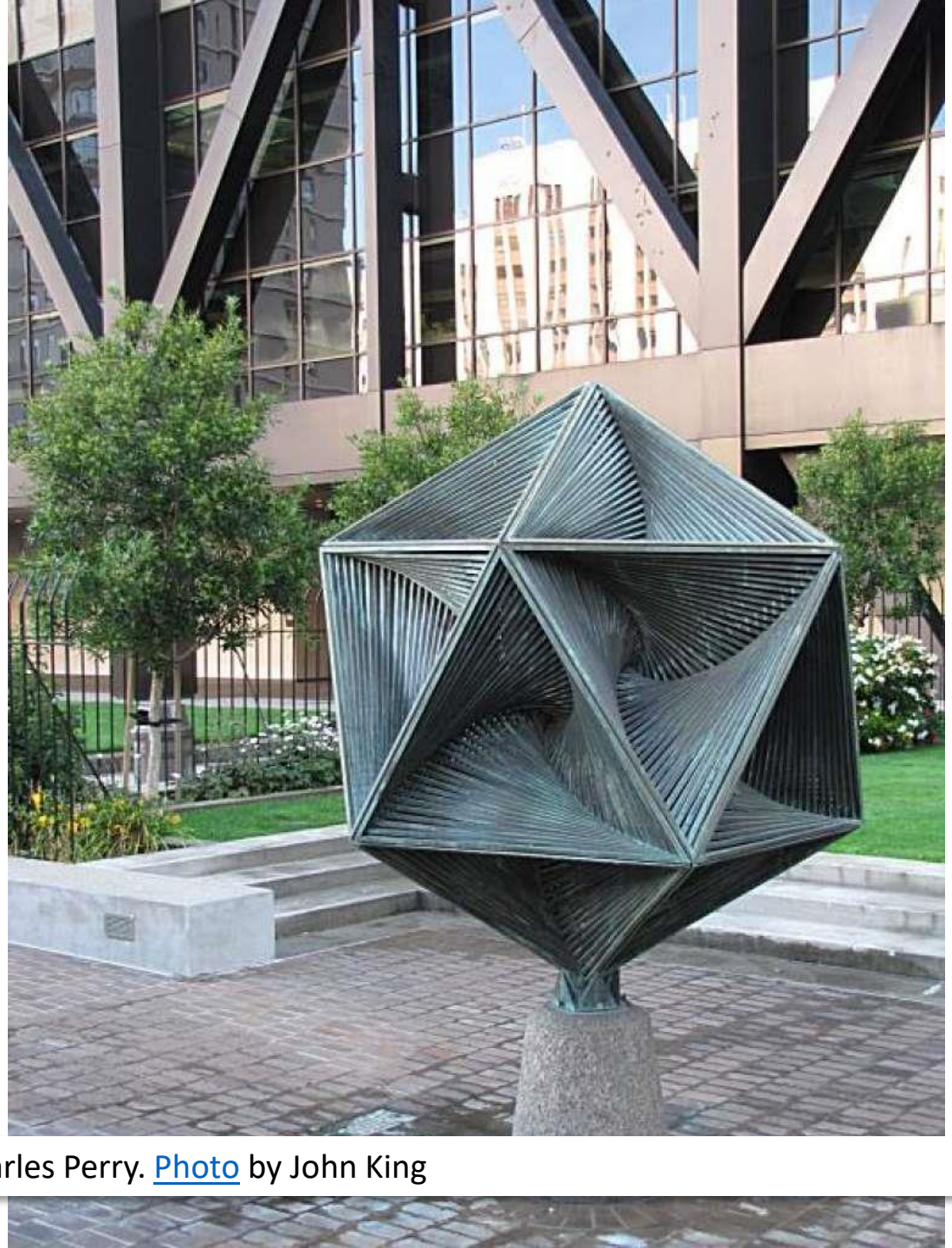
Twisted bridge, Vlaardingen, Netherlands

Bridge of Aspirations, Floral Street, London. Photo: Clarissa Grandi

High Trestle Trail Bridge, Iowa. Photo by Tony Webster

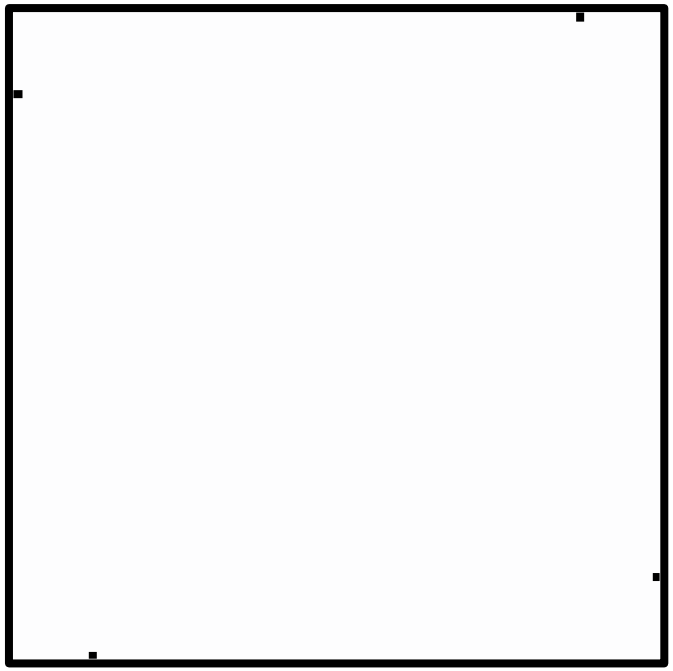


“Logo”, 3D printed artwork by Manuel Diaz Regueiro



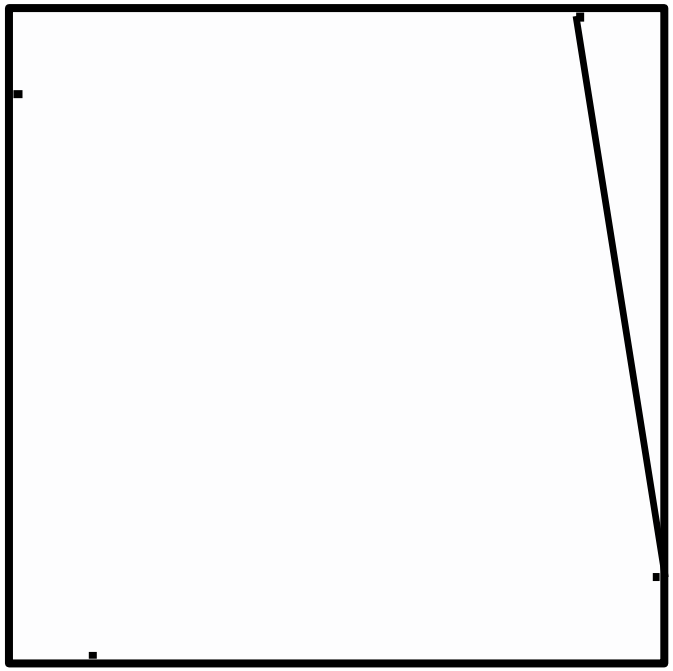
Icosaspirale, by Charles Perry. Photo by John King

Curve of pursuit crop circle. Desenberg, Germany August 2001

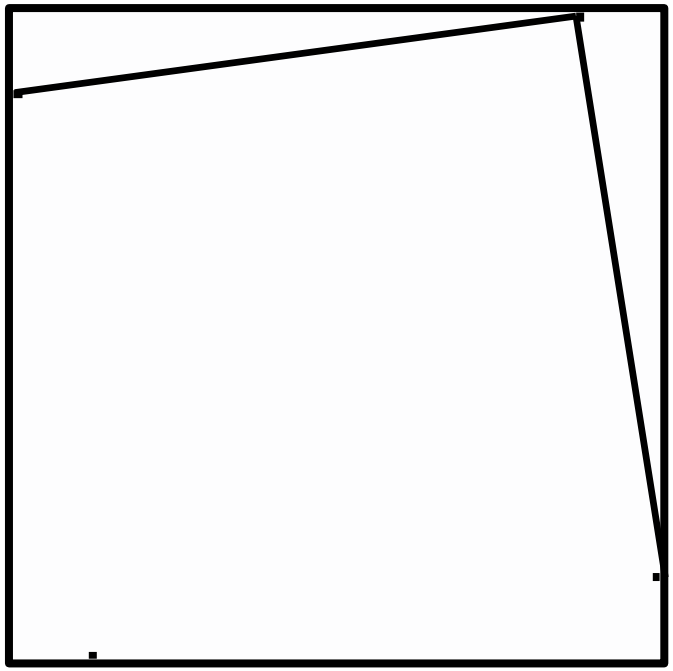


Start by drawing a regular polygon.

Make 4 small marks the same distance in from each side...



then join the marks up...



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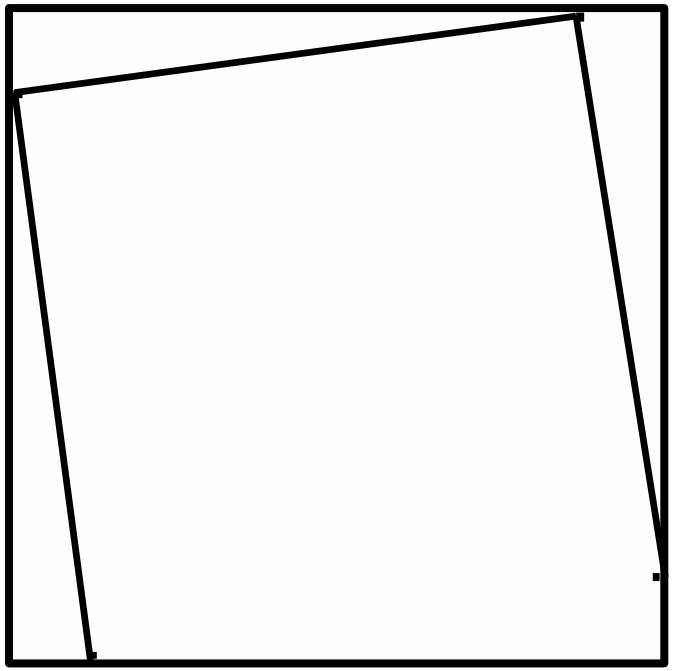
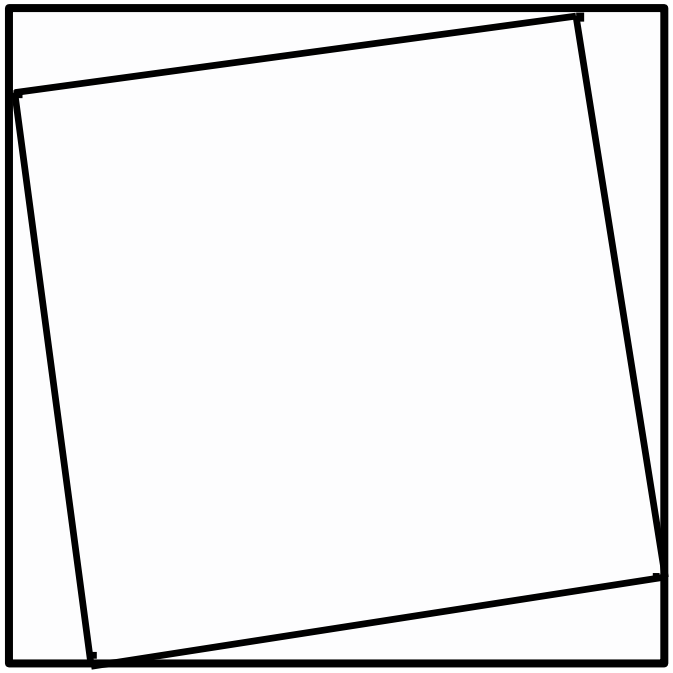
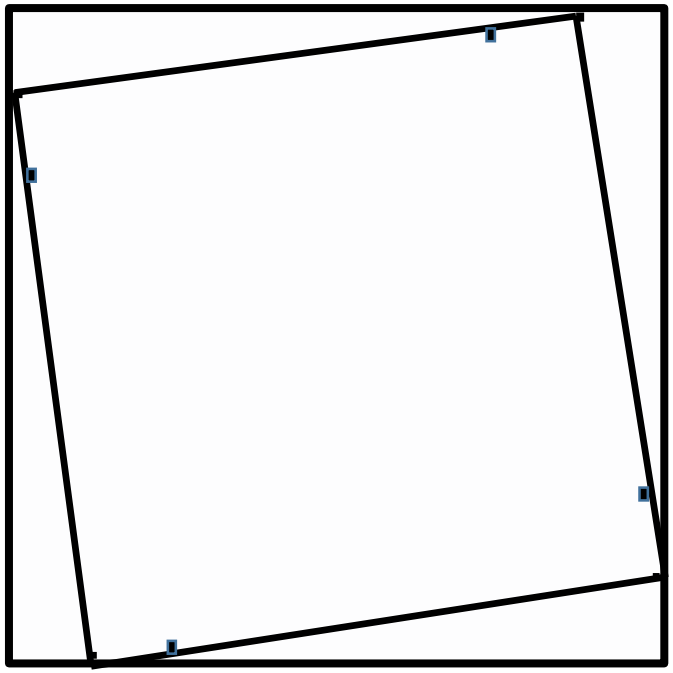


then join the marks up...

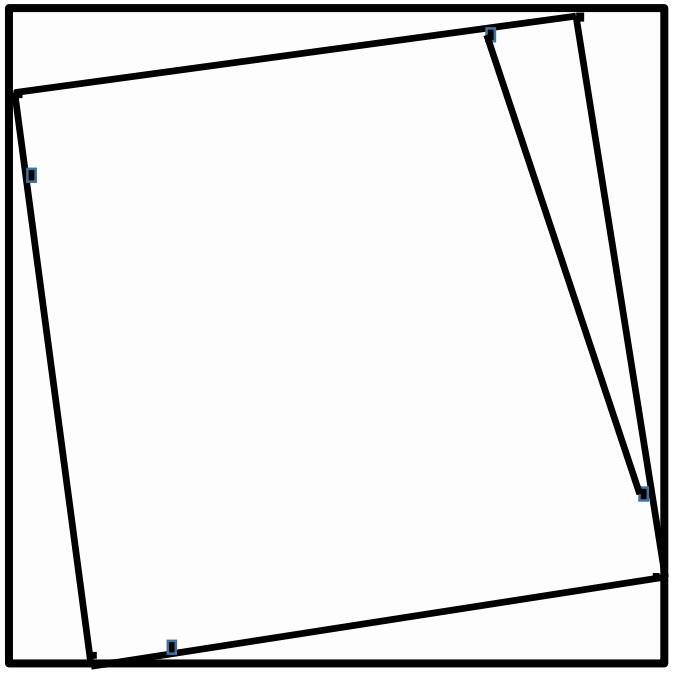


then join the marks up...

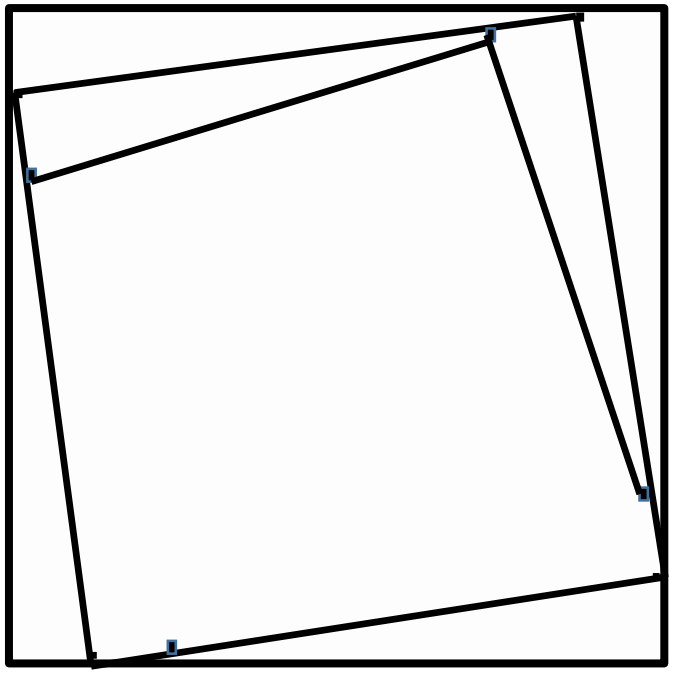
to make a smaller polygon within the larger one.



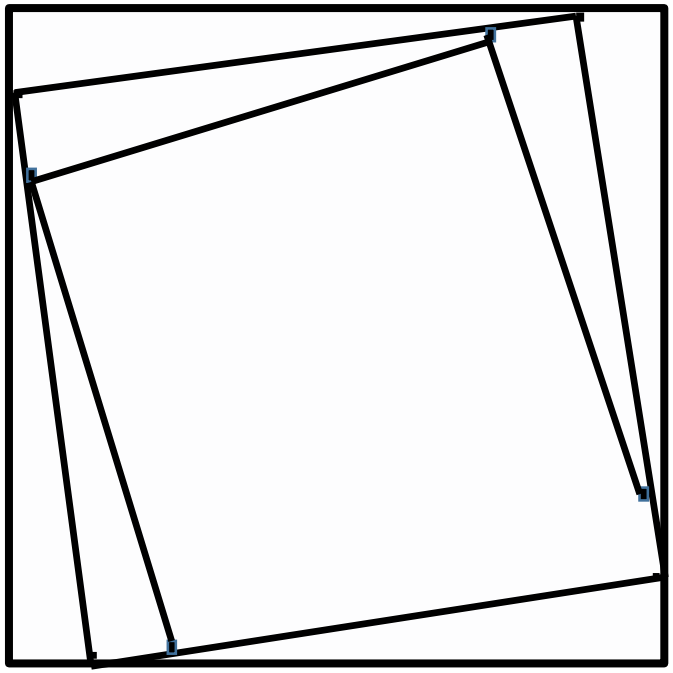
And again, make 4 small marks the same distance from each side of the new polygon...



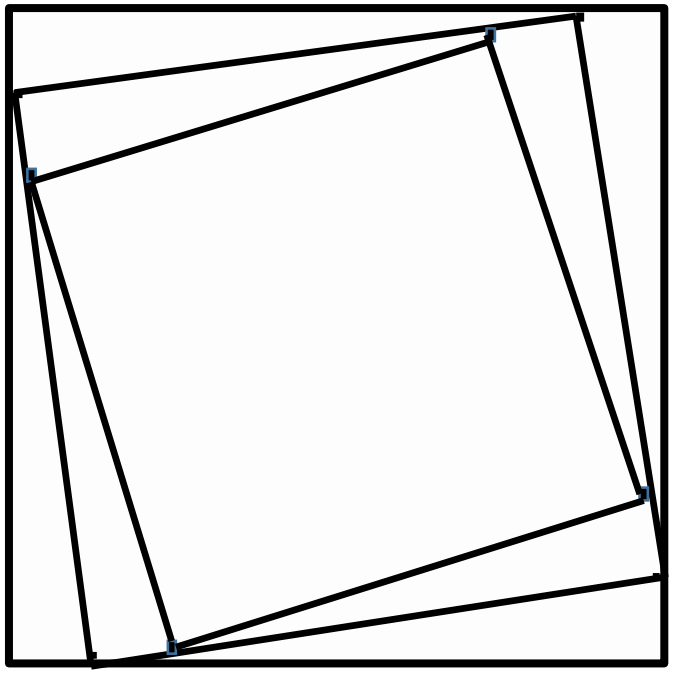
and join the marks up...



and join the marks up...

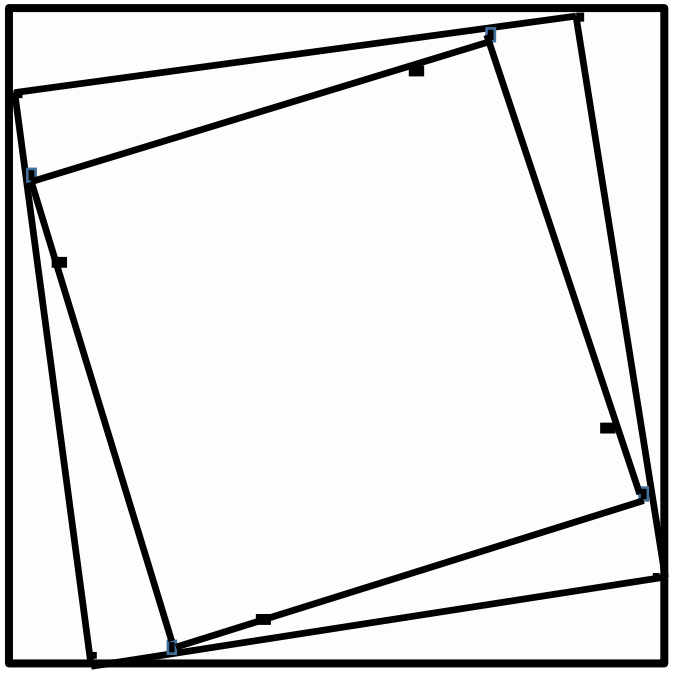


and join the marks up...

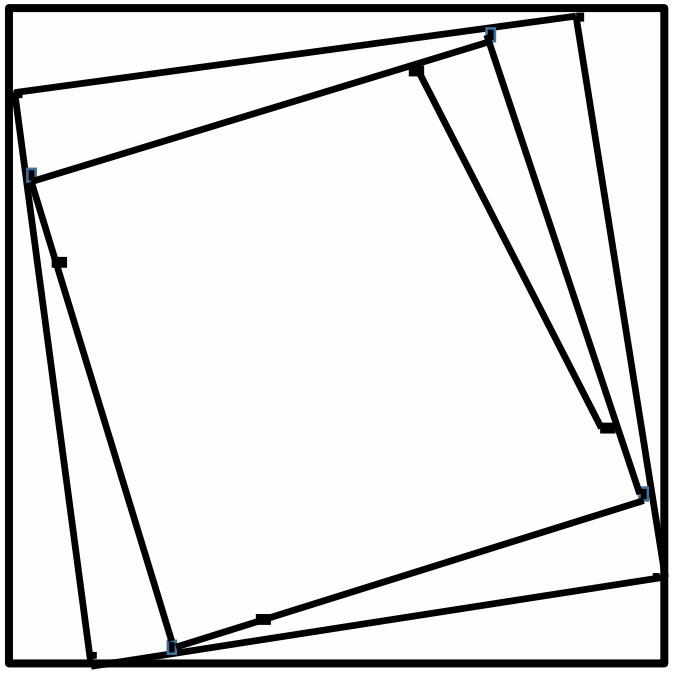


and join the marks up...

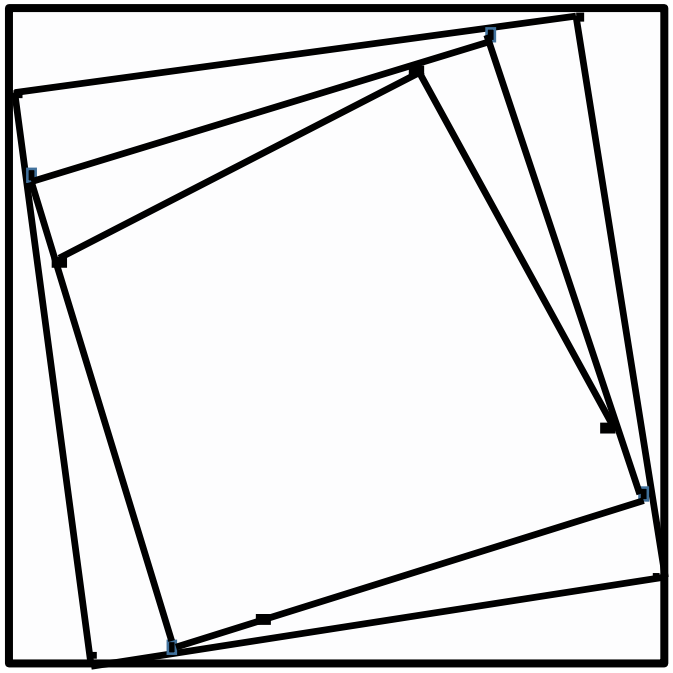
to make a smaller polygon within the larger one.



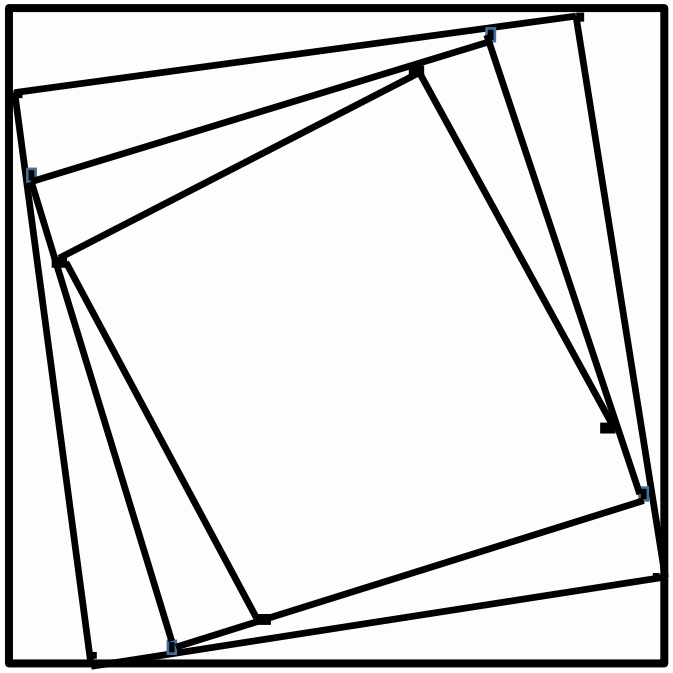
And again, four small marks...



join them up...



join them up...



and on and on....

Constructing a hexagon

Think, pair, share:

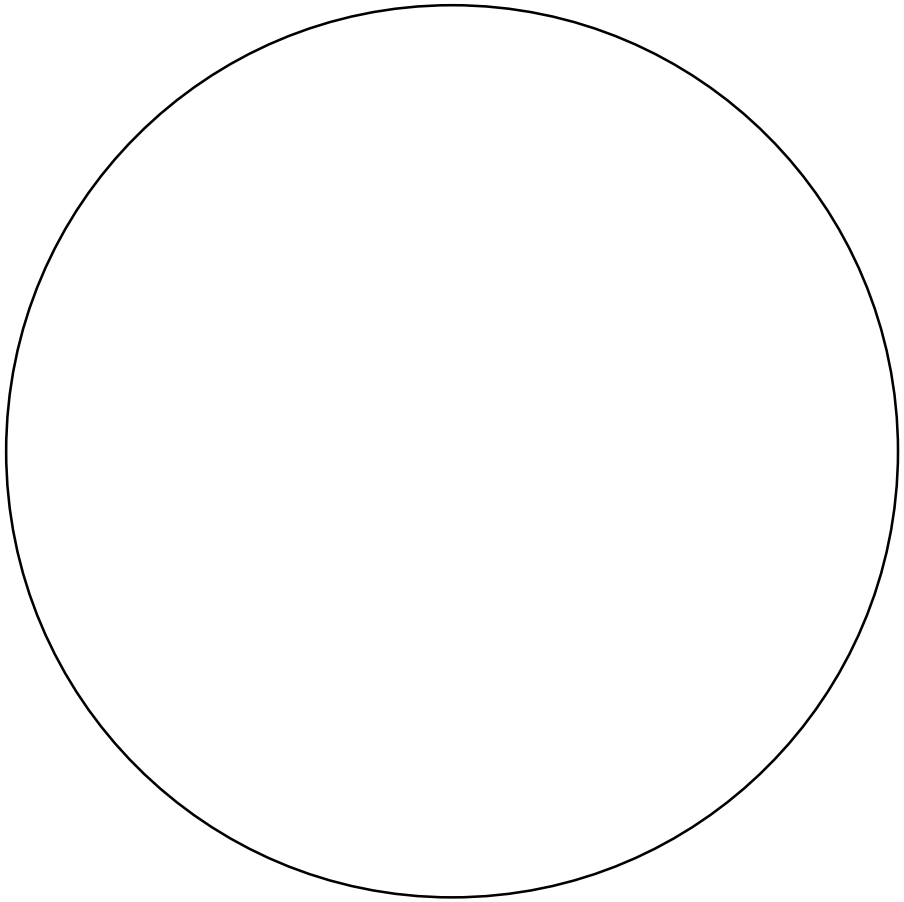
How can you construct a regular hexagon from a circle using only a pair of compasses?

30 secs to think

1 min to discuss in a pair

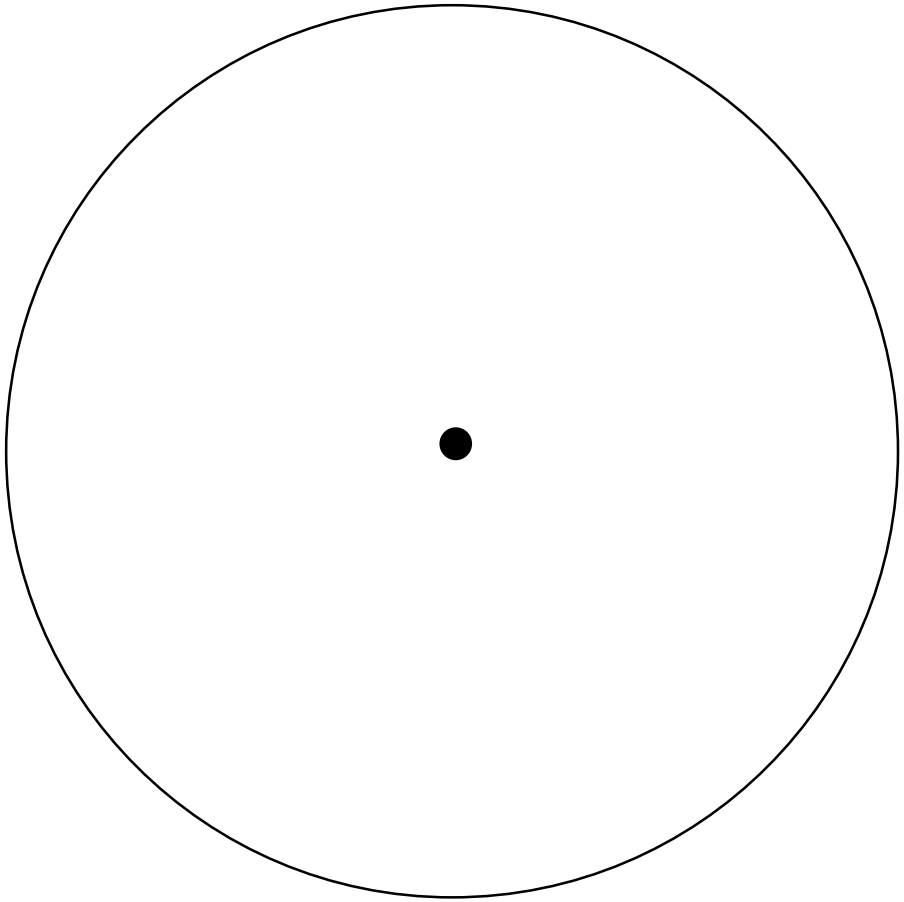
Then we'll share

Constructing a hexagon



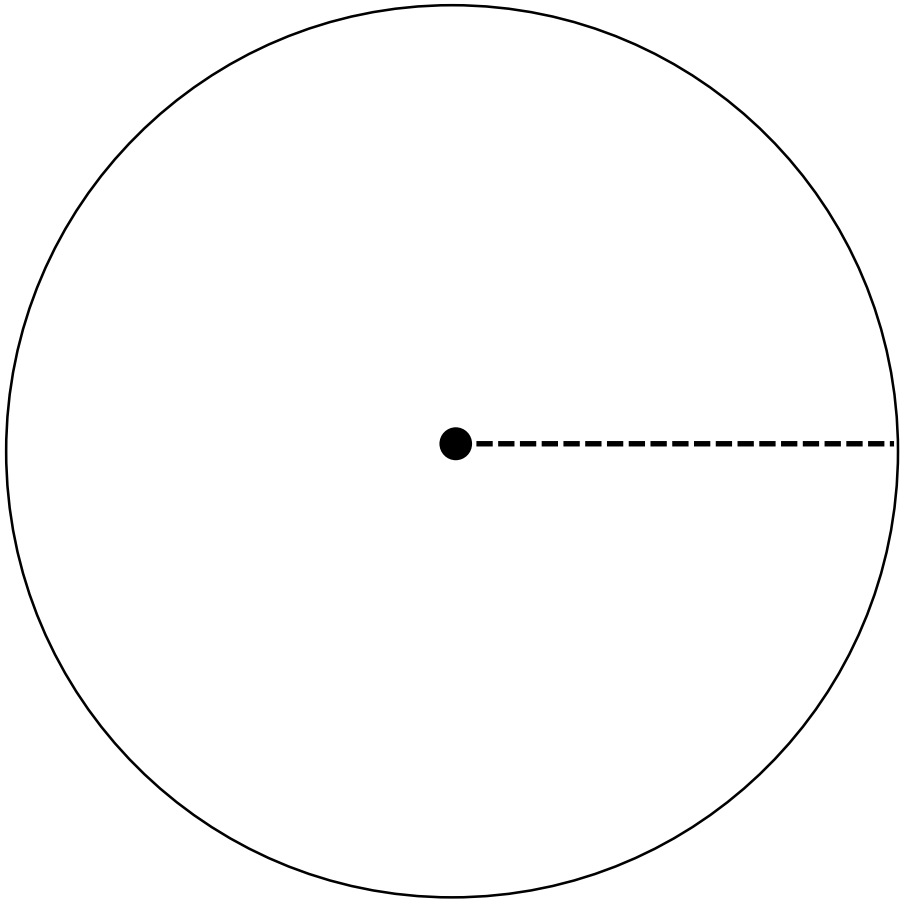
Start by drawing a circle

Constructing a hexagon



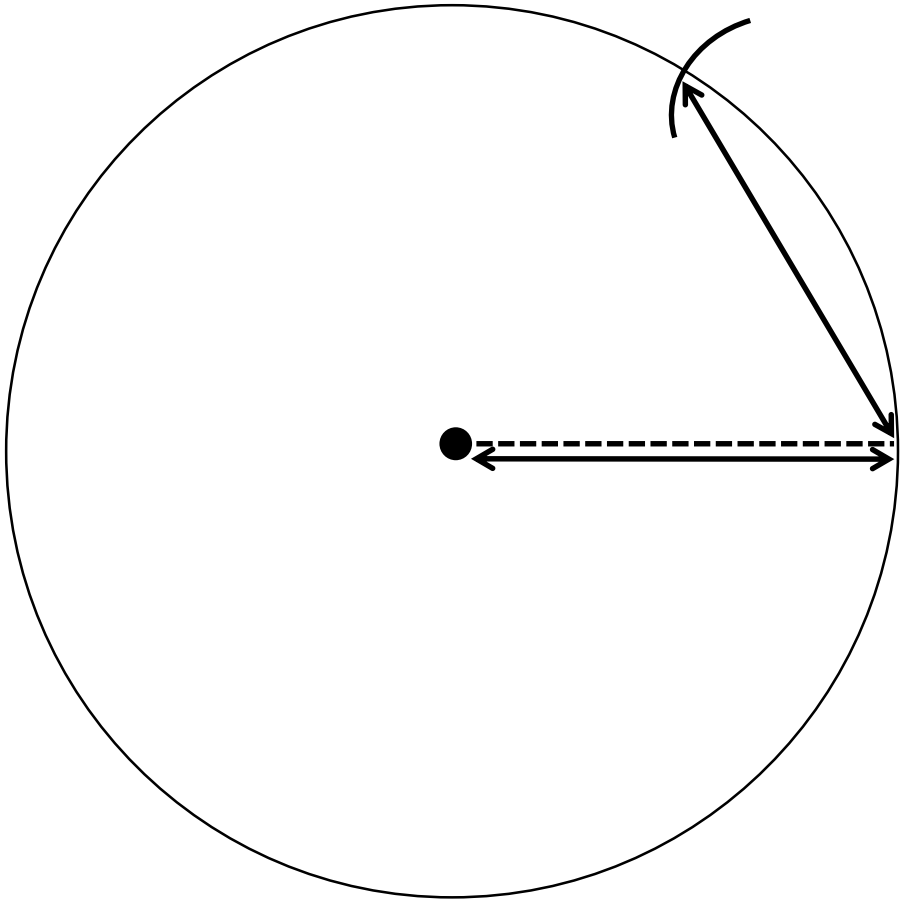
Mark the centre faintly

Constructing a hexagon



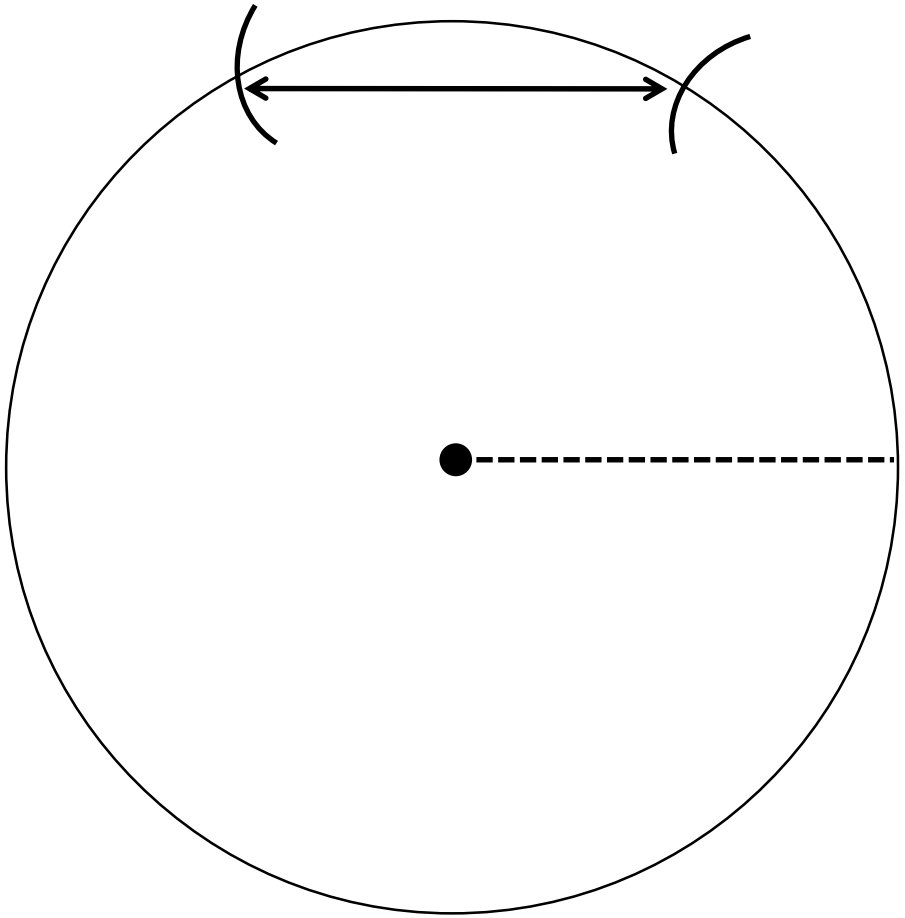
Draw in a faint radius

Constructing a hexagon



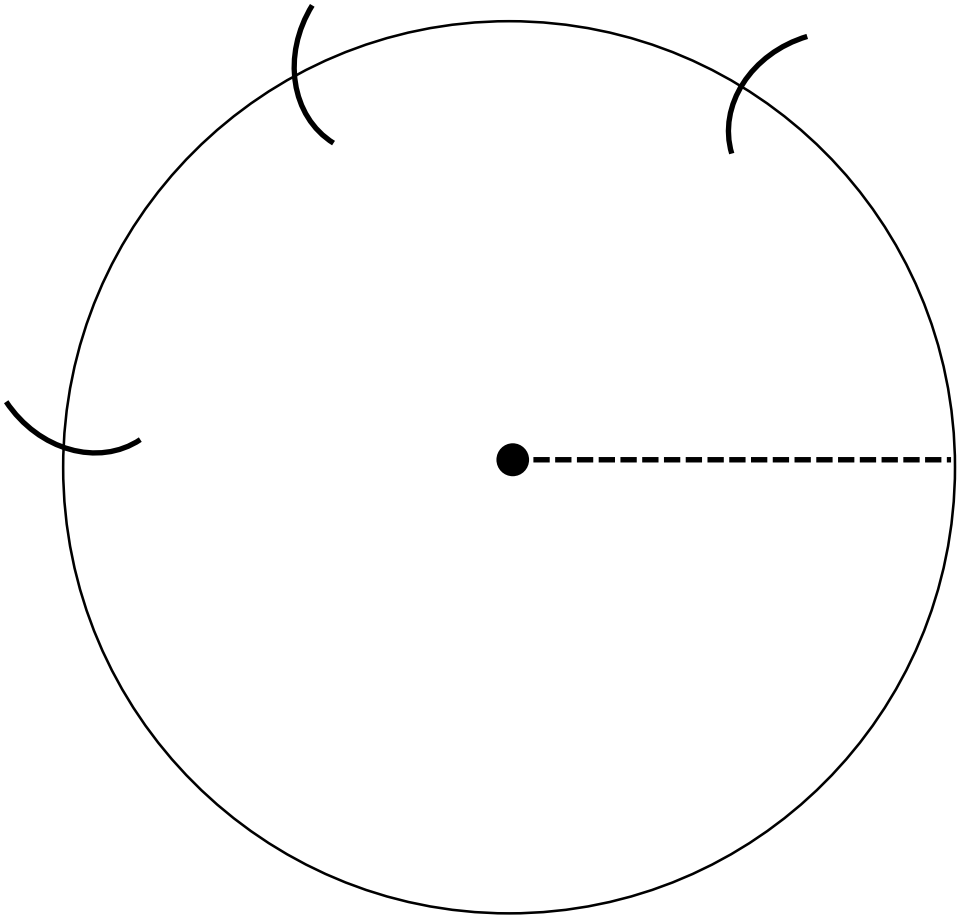
With your compasses, draw an arc the same length as the radius

Constructing a hexagon



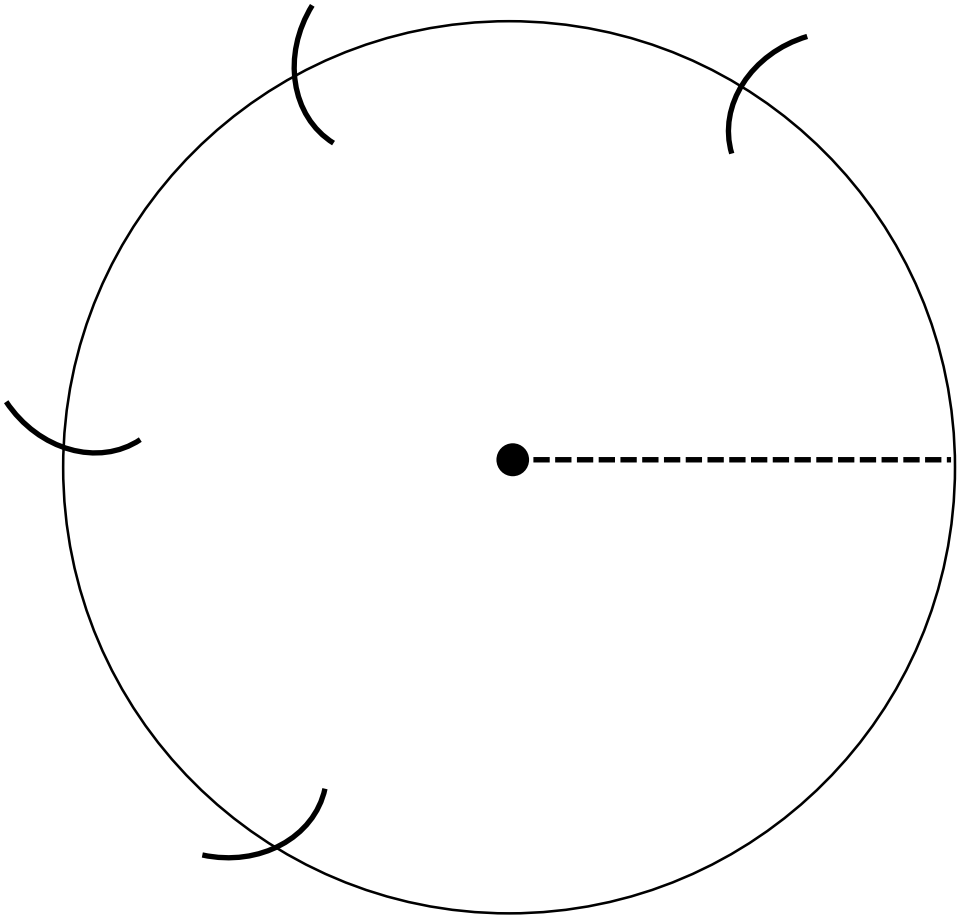
And another …

Constructing a hexagon



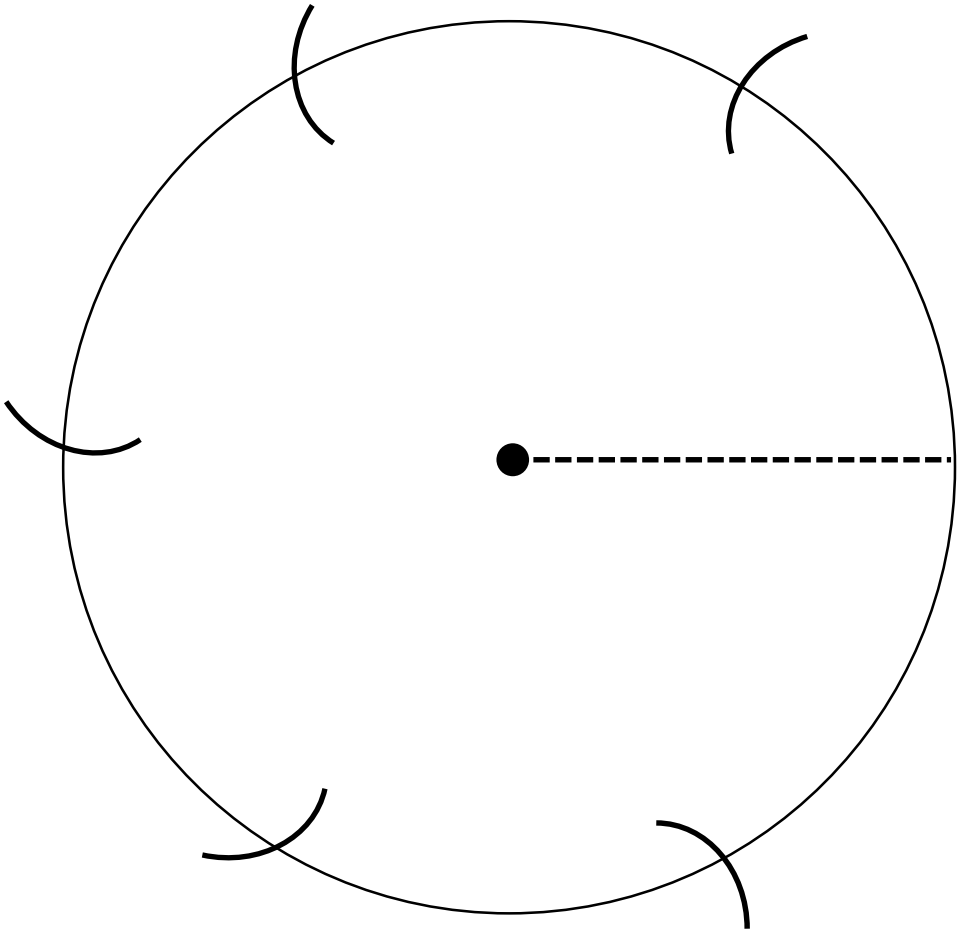
And another …

Constructing a hexagon



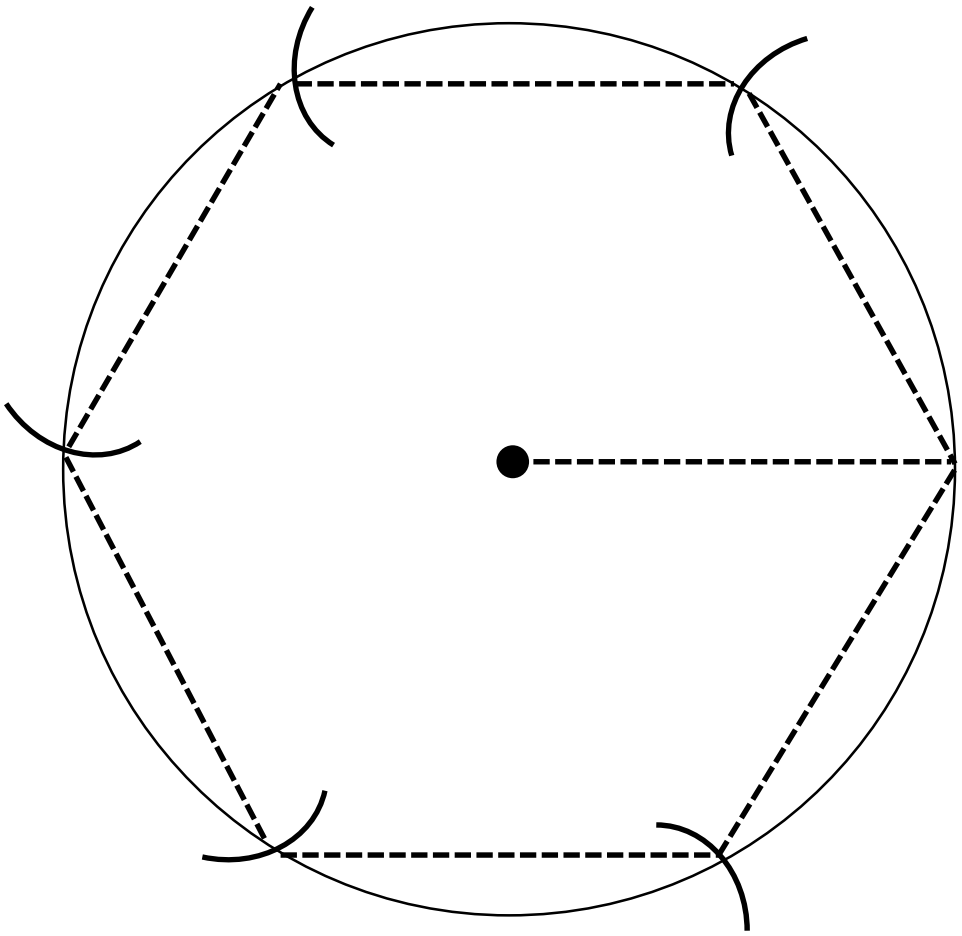
And another …

Constructing a hexagon



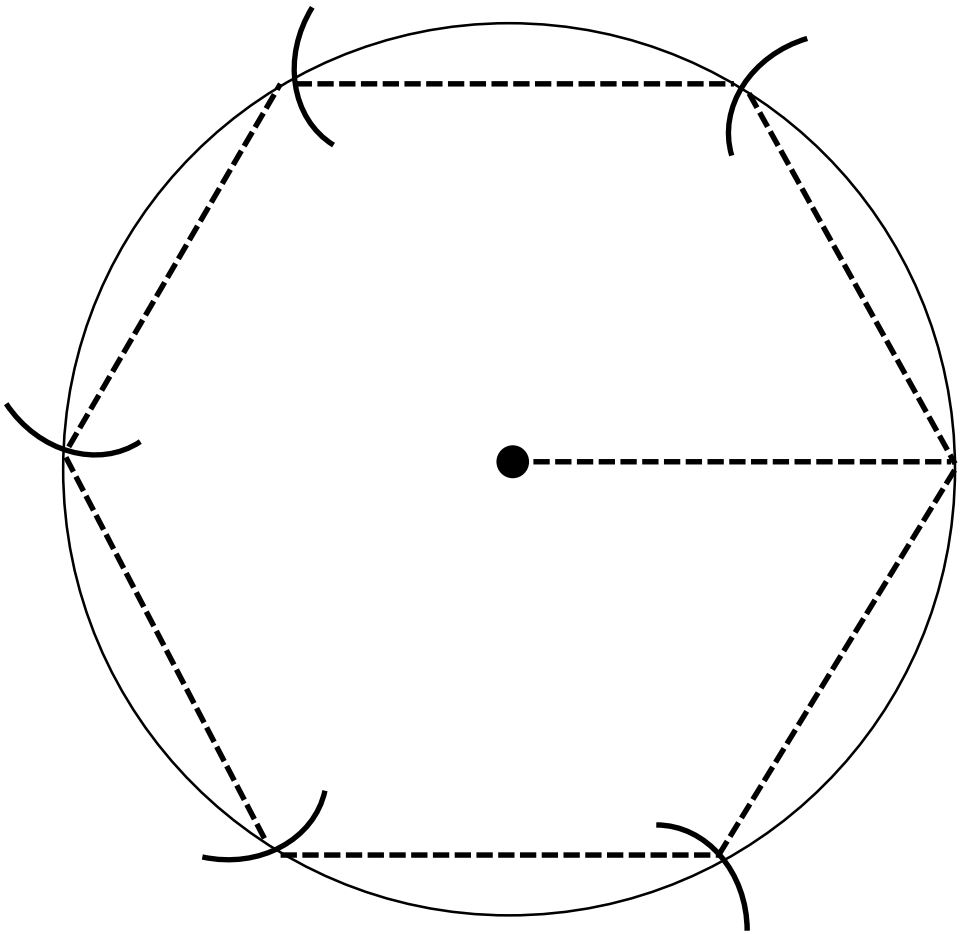
And one more

Constructing a hexagon



Join up the points to create the hexagon

Constructing a hexagon



Why does this method produce a regular hexagon?

Time to experiment with hexagons!