Chapter 2 MA1020 Quantitative Literacy

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A tiling is a covering of the entire plane with a non-overlapping figure.

Question

Given one or more shapes of tiles, can they tile the plan? If so how?

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Examples

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A monohedral tiling is a tiling that uses only one shape and size of tile.

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A polygon is a plane figure consisting of line segments that can be traced so that the starting and ending points are the same and the path never crosses itself.

Exterior & Interior Angles

- Sum of all exterior angles
- Sum of all interior (vertex) angles

A regular polygon is a polygon where all the sides have the same length and all angles are equal.

n-gon

- Exterior angle
- Interior angle
- Pentagon example

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Concavity





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Concave

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Regular Tilings

Definition

A regular tiling is a monohedral tiling with a regular polygon.



Problem

Find all regular, edge-to-edge tilings of the plane.

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A semiregular tiling is an edge-to edge tiling by two or more different types of regular polygonal regions in which vertex figures are the same size and shape no matter where they are drawn in the tiling.

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Tilings Involving Triangles

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Tilings Involving Quadrilaterals

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Tilings Involving Pentagons

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Tilings Involving Hexagons

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Tilings Involving 7-gons or larger

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Pythagorean Theorem

$$a^2 + b^2 = c^2$$

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Pythagorean Theorem



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