MATH 1300, Mathematical Explorations

Geometry and Tessellations

Activity

Questions for class

References and resources

The Art of Mathematics: Truth, Reasoning, Certainty, and Proof

Wikipedia: Tessellation

Method for Creating Tessellations from Rectangles

Tessellations Introduction

Notes

Assignments

The following questions concern the following problem:

> I want to cover the ground on a large plaza with identical tiles. What shapes of tiles can I use for this?

1. The question is put to a vote, and the winning vote is for rectangular tiles. Unfortunately, the machinery for making the tiles went wrong and the tiles end up parallelograms, instead. Can I still cover the plaza?

2. I put in an order for triangular tiles, but and all of the tiles ended up lopsided again, with three sides of different lengths. Luckily, all of the tiles are identical. Can I still cover the plaza? Justify your answer. (Expected length: 1 paragraph.)

3. I try to contact a different company. It turns out that I can only get tiles which are shaped like regular polygons: every tile has all sides the same and all angles the same. What shapes can I use? Justify your answer. (Expected length: 1 paragraph.)

4. The city council decides to take over the problem and tells me that it wants all of the tiles to have five sides, in honor of the five founders of the city. In light of the extra demand, they give me funding to design the tiles myself. Can I do this? In other words, can I cover the plaza with identical copies of some pentagon? If no, explain why not. If yes, draw the pentagon and show how it tessellates.

5. Design a tessellation based on an animal. For ideas, look here, or here, or do your own Google search.

Follow-on activities