Richard Stanley guesses that determining whether or not an arbitrary polyomino can be used to tile a rectangle is undecidable—that is, there is not a general purpose algorithm that can do so. We call such polyominoes "rectifiable."

Here we define something different: we say that a polyomino is "toroidal" if it can be used to tile a rectangular torus grid. All rectifiable polyominoes are toroidal, and all polyominoes that tile the plane with two dimensions of translational symmetry are toroidal.

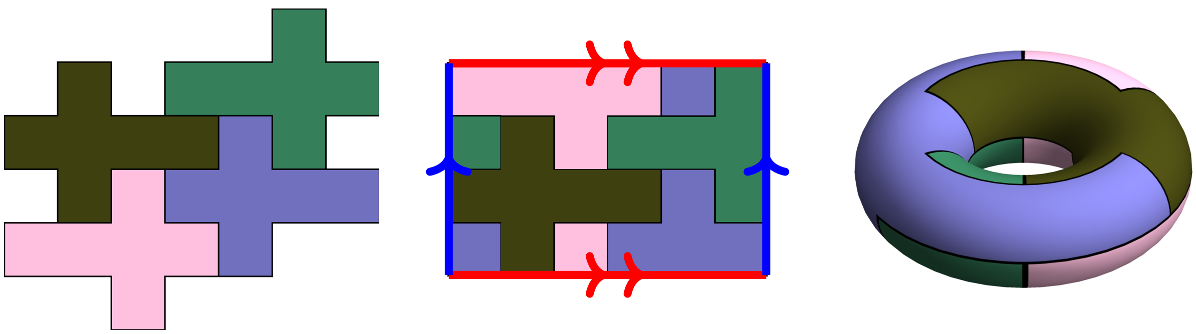

Figure 1: An illustration of a toroidable 6-omino that is not rectifiable.

Question. For each n, what is the toroidable n-omino with the largest minimal torus?

Related.

1. What about polyiamonds? Polyhexes? Other polyforms?
2. Suppose we want to k-color the torus so that no color is adjacent to itself by an edge (alternatively, vertex). What is the largest minimal coloring over all n-ominoes.

References.

MathOverflow.