The 18th Hilbert’s problem concerns the ways in which $n$-dimensional Euclidean space can be “tiled” or “packed” with congruent copies of a single geometric figure. This paper is an attempt to summarize what is known about a particular special case of the tiling problem in two dimension. The only tiles considered are polyominoes, where an “$n$-omino” is any connected figure obtained by taking $n$ identical unit squares, and connecting them along common edges. A typical problem in polyomino theory is to determine which polyominoes have the property that unlimited copies of a specific one will tile the entire plane or a single quadrant or an infinite strip. This paper focusses primarily on the question of which polyomino shapes have the property that some finite number of copies of the basic shape, allowing all rotations and reflections, can be assembled to form a rectangle. This problem, as other tiling problems, is not yet resolved and the author concludes: “This is a subject which is accessible to amateurs but lies close to the very heart of mathematics and continues to provide a seemingly inexhaustible supply of intriguing and provocative questions”.

Reviewer: R. Franci (Siena)

MSC:
01A65 Development of contemporary mathematics
51-03 History of geometry
51M20 Polyhedra and polytopes; regular figures, division of spaces

Keywords:
polyomino; tiling

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