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Autor: Reid, Michael

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THEOREM 7.15. Let $\mathcal{T} = \{ \text{[rectangle with 6 vertical dashed lines]}, \text{[cross shape]}, \text{[L-shaped polyomino]} \}$, where all orientations are allowed.

- (a) If \mathcal{T} tiles an $m \times n$ rectangle, then one of m or n is a multiple of 6.
 (b) A 2×3 rectangle has a signed tiling by \mathcal{T} .

THEOREM 7.16. Let $\mathcal{T} = \{ \text{[trapezoid with 3 dashed lines]} \}$, where all orientations are allowed.

- (a) If \mathcal{T} tiles a triangle of side n , then n is a multiple of 8.
 (b) A triangle of side 4 has a signed tiling by \mathcal{T} .

REMARK 7.17. That \mathcal{T} tiles any triangle is quite interesting. Karl Scherer [15, 2.6 D] has found a tiling of a side 32 triangle by \mathcal{T} .

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REFERENCES

- [1] AKSYONOV, YU. E-mail communication to Torsten Sillke. March 1999 (<http://www.mathematik.uni-bielefeld.de/~sillke/PENTA/qu5-y-right>).
- [2] BERLEKAMP, E. R., J. H. CONWAY and R. K. GUY. *Winning Ways for Your Mathematical Plays*, vol. 2. Academic Press, London, 1982.
- [3] BLACK, M. *Critical Thinking*. Prentice-Hall, New York, 1946.
- [4] CONWAY, J. H. and J. C. LAGARIAS. Tiling with polyominoes and combinatorial group theory. *J. Combin. Theory Ser. A*, 53 (1990), 183–208.
- [5] THE GAP GROUP. GAP – Groups, Algorithms and Programming, version 4.3, 2002 (<http://www.gap-system.org>).
- [6] GAREY, M. R. and D. S. JOHNSON. *Computers and Intractability*. Freeman, San Francisco, 1979.
- [7] GOLOMB, S. W. Checker boards and polyominoes. *Amer. Math. Monthly* 61 (1954), 675–682.
- [8] ———. Covering a rectangle with L -tetrominoes, Problem E1543. *American Mathematical Monthly* 69 (1962), 920.
 Solution by D. A. KLARNER: *Amer. Math. Monthly* 70 (1963), 760–761.
- [9] HALL, M. JR. *The Theory of Groups*. Chelsea, New York, 1976.
- [10] KLARNER, D. A. Packing a rectangle with congruent N -ominoes. *J. Combin. Theory* 7 (1969), 107–115.
- [11] LANGMAN, H. *Play Mathematics*. Hafner, New York, 1962.

- [12] MOORE, C. and J. M. ROBSON. Hard tiling problems with simple tiles. *Discrete Comput. Geom.* 26 (2001), 573–590.
- [13] PAK, I. Ribbon tile invariants. *Trans. Amer. Math. Soc.* 352 (2000), 5525–5561.
- [14] PROPP, J. A pedestrian approach to a method of Conway, or, A tale of two cities. *Math. Mag.* 70 (1997), 327–340.
- [15] SCHERER, K. *A Puzzling Journey to the Reptiles and Related Animals*. Privately published, Auckland, 1987 (<http://karl.kiwi.gen.nz/bkrintro.html>).
- [16] SCHRIJVER, A. *Theory of Linear and Integer Programming*. John Wiley & Sons, Chichester, 1986.
- [17] WALKUP, D. W. Covering a rectangle with T -tetrominoes. *Amer. Math. Monthly* 72 (1965), 986–988.

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Michael Reid

Department of Mathematics
University of Central Florida
Orlando, FL 32816
U. S. A.
e-mail: reid@math.ucf.edu

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