

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 49 (2003)
Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Artikel: TILE HOMOTOPY GROUPS

Autor: Reid, Michael

Bibliographie

DOI: <https://doi.org/10.5169/seals-66684>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Siehe Rechtliche Hinweise.

Conditions d'utilisation

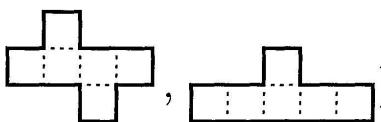
L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. Voir Informations légales.

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. See Legal notice.

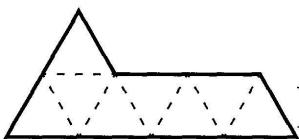
Download PDF: 30.01.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>



THEOREM 7.15. Let $\mathcal{T} = \{ \text{[L-shaped polyominoes]} \}$, 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 $\mathcal{T} = \{ \text{[Right-angled triangle divided into six smaller triangles]} \}$, 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} .

ACKNOWLEDGMENT. I thank Torsten Sillke for some interesting discussions.

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.

(Reçu le 8 décembre 2002)

Michael Reid

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

vide-leer-empty