

Grades 5-8 (S), 9-12 (S)

Duration: 25 min

Tools: one block / student

Individual / Pair work

Keywords: Perimeter, Polygon,
Triangle, Rectangle, Trapezium,
Pythagorean theorem

407 - Perimeter



MATHS / 2D GEOMETRY



LOGIFACES
METHODOLOGY
Erasmus+

TEACHER
Logifaces

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DESCRIPTION

Each student gets a Logifaces block and calculates the perimeters of the polygon faces of the block. They draw and name the polygons, and find the lengths of the edges and the perimeter. For the sake of simplicity, they use the standard units in their calculations.

Additional question: The students form pairs and both members of the pair get a block of the same type (see the solution for the types). They compare the calculated perimeters and discuss the similarities and the differences.

SOLUTIONS / EXAMPLES

base of each block:

equilateral triangle, perimeter: $4 + 4 + 4 = 12$

BLOCKS OF TYPE I.

block 111:

vertical faces are rectangles, perimeter of each face: $4 + 1 + 4 + 1 = 10$

top face: equilateral triangle, perimeter: $4 + 4 + 4 = 12$

block 222:

vertical faces are rectangles, perimeter of each face: $4 + 2 + 4 + 2 = 12$

top face: equilateral triangle, perimeter: $4 + 4 + 4 = 12$

block 333:

vertical faces are rectangles, perimeter of each face: $4 + 3 + 4 + 3 = 14$

top face: equilateral triangle, perimeter: $4 + 4 + 4 = 12$

See exercise [404 - Top Edges](#) for the detailed calculation of the lengths of the edges connecting the top vertices of vertical edges with different lengths, used in the following blocks.

BLOCKS OF TYPE II.

block 112:

vertical faces

- one rectangular face, perimeter: $4 + 1 + 4 + 1 = 10$

- two trapezium faces, perimeter: $4 + 1 + \sqrt{17} + 2 = 7 + \sqrt{17} \approx 11.12$

top face: isosceles triangle, perimeter: $4 + \sqrt{17} + \sqrt{17} \approx 12.24$

block 122:

vertical faces

- one rectangular face, perimeter: $4 + 2 + 4 + 2 = 12$

- two trapezium faces, perimeter: $4 + 1 + \sqrt{17} + 2 = 7 + \sqrt{17} \approx 11.12$

top face: isosceles triangle, perimeter: $4 + \sqrt{17} + \sqrt{17} \approx 12.24$

block 223:

vertical faces

- one rectangular face, perimeter: $4 + 2 + 4 + 2 = 12$

- two trapezium faces, perimeter: $4 + 2 + \sqrt{17} + 3 = 9 + \sqrt{17} \approx 13.12$

top face: isosceles triangle, perimeter: $4 + \sqrt{17} + \sqrt{17} \approx 12.24$

block 233:

vertical faces

- one rectangular face, perimeter: $4 + 3 + 4 + 3 = 14$

- two trapezium faces, perimeter: $4 + 2 + \sqrt{17} + 3 = 9 + \sqrt{17} \approx 13.12$

top face: isosceles triangle, perimeter: $4 + \sqrt{17} + \sqrt{17} \approx 12.24$

BLOCKS OF TYPE III.

block 113:

vertical faces

- one rectangular face, perimeter: $4 + 1 + 4 + 1 = 10$

- two trapezium faces, perimeter: $4 + 1 + \sqrt{20} + 3 = 8 + \sqrt{20} \approx 12.47$

top face: isosceles triangle, perimeter: $4 + \sqrt{20} + \sqrt{20} \approx 12.94$

block 133:

vertical faces

- one rectangular face, perimeter: $4 + 3 + 4 + 3 = 14$

- two trapezium faces, perimeter: $4 + 1 + \sqrt{20} + 3 = 8 + \sqrt{20} \approx 12.47$

top face: isosceles triangle, perimeter: $4 + \sqrt{20} + \sqrt{20} \approx 12.94$

BLOCKS OF TYPE IV.

block 123 or 132:

vertical faces

- trapezium face 12, perimeter: $4 + 1 + \sqrt{17} + 2 = 7 + \sqrt{17} \approx 11.12$

- trapezium face 23, perimeter: $4 + 2 + \sqrt{17} + 3 = 9 + \sqrt{17} \approx 13.12$

- trapezium face 13, perimeter: $4 + 1 + \sqrt{20} + 3 = 8 + \sqrt{20} \approx 12.47$

top face: isosceles triangle, perimeter: $\sqrt{17} + \sqrt{17} + \sqrt{20} \approx 12.72$

PRIOR KNOWLEDGE

Perimeter of a polygon, Pythagorean theorem

RECOMMENDATIONS / COMMENTS

This exercise can be used to differentiate: the blocks of type I. (111, 222, 333) are the easiest to compute, the blocks of type II-III. are more difficult (122, 112, 113, 133, 223, 233), and the blocks of type IV. (123, 132) are the most difficult.