Problemen

Problem Section

All three problems ask for a construction with origami in a limited number of moves.
More precisely, given a collection of points and lines (or *folds*) in the plane, a *move* (cf. the Huzita–Justin–Hatori axioms) consists of adding to the collection one of the following:

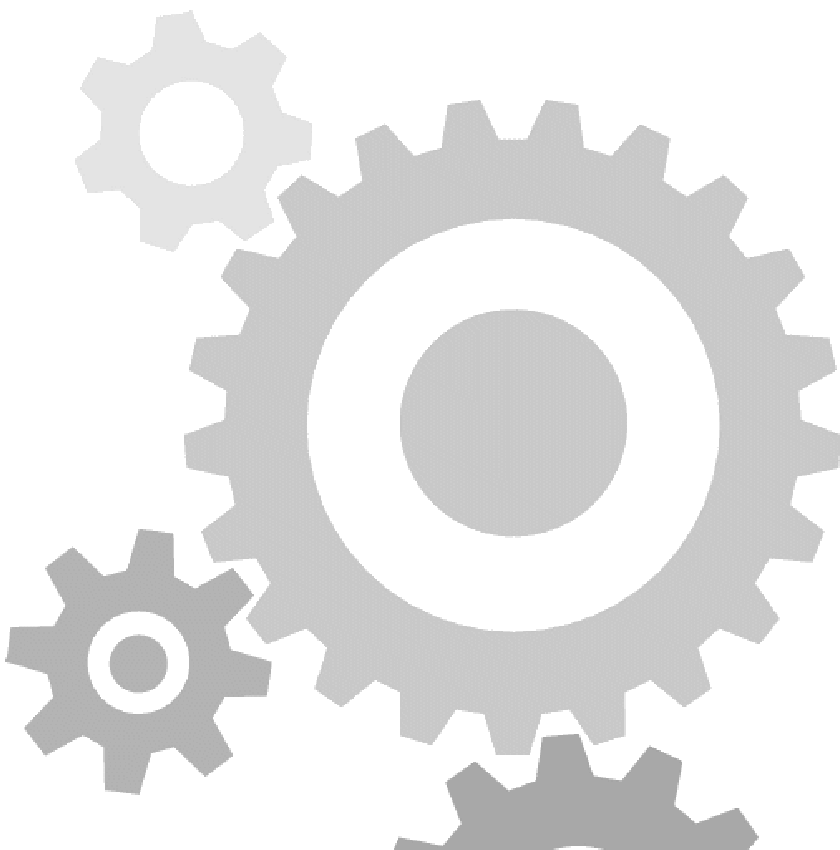
- a fold aligning two distinct points;
- a fold aligning two distinct lines;
- if it exists, a fold having two properties of the following types (except for type 3, one may have two distinct alignments of the same type):
  1. the fold aligns a point with a line;
  2. the fold passes through a point;
  3. the fold is perpendicular to a line;
- a sufficiently general fold having at most one property of types 1, 2 and 3.

For example, given points P_1 and P_2 and lines l_1 and l_2, examples of moves are adding a fold that aligns P_1 with l_1 and P_2 with l_2 (having two properties of type 1), and adding a fold perpendicular to l_2 aligning P_1 with l_1 (having a property of type 1 and one of type 3). (These two example moves correspond to axioms 6 and 7 from the Huzita–Justin–Hatori axioms.) At any time one is allowed to freely add any intersection point among the lines.
For example, one can construct a square (including its sides) in five moves as follows. First, make any fold l. Then make any two distinct folds l_A and l_B perpendicular to l. Let A and B be the intersections of l with l_A and l_B, respectively. Next, make a fold d aligning l and l_A, and denote its intersection with l_B by C. Finally, make the fold m perpendicular to l_A passing through C, and denote its intersection with l_A by D. Then $ABCD$ (together with the lines l, l_A, l_b, m) is a square.

Problem A
Given three points A, B, and C, and a line l passing through C, construct in at most six moves a point D on the line l such that $|CD| = |AB|$.

Problem B
Construct a golden rectangle (including its sides) in at most eight moves.

Problem C
Given two points A and B, construct in at most four moves the point C on the segment AB such that $|AC| = \frac{1}{3}|AB|$.



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