

MATHEMATICAL ORIGAMI IN THE HYPERBOLIC PLANE

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We consider analogues of the Huzita single fold axioms (cf. [3]) for mathematical origami in the hyperbolic plane. There are eight such alignment axioms in the hyperbolic plane.

We discuss the connection of these axioms with ruler and compass constructions in the hyperbolic plane. All ruler and compass constructions can be done with origami including constructions with general ‘cycles’: circles, equidistant curves and horocycles.

The most significant axiom allows for the construction of solutions to certain cubic and quartic equations. We discuss how this extends the possible geometrical constructions beyond ruler-compass constructions (cf. [1]). This main axiom of hyperbolic origami geometry can be interpreted as allowing the construction of the common tangents to two ‘parabolic’ curves. This leads to the origami hyperbolic quartic curve (cf. [2]). The method for solving a quartic essentially locates the intersections of this origami quartic curve and a given line.

REFERENCES

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