

The Brahmagupta's theorem after Coxeter.

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The Heron's formula is well known from the elementary school. It gives the area of an Euclidean triangle in terms of lengths of the sides. The non-Euclidean versions of this theorem can be found, for example, in the book by E. B. Vinberg, *Geometry II: Spaces of Constant Curvature*, Springer-Verlag, 1993. The Brahmagupta's theorem is a direct generalization of the Heron's ones for the case of inscribed quadrilateral.

Following the ideas of Coxeter J. E. Valentine, 1970 gave necessary and sufficient conditions for four points of the hyperbolic plane lie on a circle, line, horocycle, or one branch of an equidistant curve. In this report we use these results to find a few non-Euclidean generalizations of the Brahmagupta's theorem.