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**Geometric loci and homothetic transformations.**

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Summary: In this paper, we use a property of the centroids to study two general types of geometric loci: one in the plane and one in the space. Then from this result, we examine in detail the case of quadrilaterals and tetrahedra and, in particular, we determine some properties of the nine-point circle of a triangle. The study of those geometric loci is carried out by means of the homothetic transformations that facilitate and make more immediate the proofs of the properties.

*Classification:* G45 G55

*Keywords:* geometric loci; homothetic transformations; quadrilaterals; tetrahedra; nine-points circle; dynamic geometry system

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