

Experiments with geometric loci

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ABSTRACT

In elementary geometry, geometric loci define a set of points that exhibit a certain given property. In planar geometry they are usually curves. Occasionally, geometric loci are discussed in school mathematics within the scope of curve sketchings. Due to the availability of dynamic geometry software (DGS) and computer algebra systems (CAS) the question arises if this topic should be viewed from a different perspective. This could potentially stimulate the mathematical education in the following aspects:

- linking geometry, analysis and algebra,
- experimental work,
- learning by discovery.

The study of geometric loci can, at least, be an enrichment in the course of talented student programs and thereby improve distinction. An assessment of the difficulties to solve the respective question is not always, a priori, possible since already for easy looking problems it occasionally turns out that e.g., finding an algebraic description of the geometric locus is difficult. On the contrary, there are also examples that are solvable with elementary school methods. The task for the lecturer is to be aware of the difficulty rating of the respective problem to really provide his students with the desired competency gain. The presentation tries to enlighten this problematic topic and to simultaneously present some examples of geometric loci from triangular geometry.

References

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Keywords

Mathematical Education, Mathematical Problem Solving, Secondary School