Affine Planes, Projective Planes and Latin Squares

Novotny, Jakub

The purpose of this paper is to introduce the reader several unusual areas of mathematics that not many people are aware of. The principles of Latin squares, projective and affine planes can be commonly found all around us. Latin squares can be bought in every tobacconist’s shop or the telephone net could be described by a projective plane. They form an important part of mathematics as well. While Latin square belongs to combinatorics, affine and projective planes lie on the border of geometry and algebra. At first glance, it might seem that these areas are not directly related. For this reason, the goal of my work was to show that it is possible to transform Latin squares into affine and projective planes. From the global point of view, this fact would provide the option of translating the results from geometry and algebra into combinatorics and vice versa. The paper is supplemented with a practical way of transformation of Latin squares into planes which might help students with a penchant for mathematics, as well as for anyone else, who can use it to create puzzles or other mathematical problems, but also as an unusual point of view to various problems of various subjects such as informatics, projecting, logistics, encrypting but also for example in development of card games.

Awards Won: