CONGRUENCE THEOREMS FOR POLYGONS

GEORG GRUETZNER AND ANTONELLA PERUCCA

From Euclid to the XXI century.

We are glad to offer you a very accessible topic which also allows for mathematical research. The aim of the project is proving new congruence theorems.

As you know, two triangles having the same side lengths must be congruent. On the other hand, knowing two side lengths and one angle is, in general, not sufficient.

Project outline: We will consider various potential congruence theorems that involve not only side lengths and angles but also heights, medians, angle bisectors... For any reasonable set of conditions we will either look for a counterexample (namely, that the given properties do not determine the polygon up to congruence) or for a proof. We will focus first on triangles and convex quadrilaterals. If we manage to prove interesting statements, we can collect them in a mathematical article.

Experimental component: In a previous similar project, experiments with GeoGebra led to the discovery of a tricky counterexample for convex hexagons.

Prerequisites: No specific prerequisites, just the willingness to prove mathematical theorems. Motivated students only.

EML Project for any Semester - Bachelor Thesis - Master Thesis
(Teamwork for up to 4 people)