

Supplementary Material 1: The Triangle Problem

The *triangle problem* (Novotná, 2017; Schindler, Joklitschke & Rott, 2018) is a multiple solution task: a mathematics problem that is supposed to be solved in different ways (Leikin, 2009). In the triangle problem, the students are asked to find different ways to reason a certain fact (that one area is a third of another one). The problem affords PP&PS in way that students are supposed to find different perspectives, to pursue them, then again find new angles, etc.

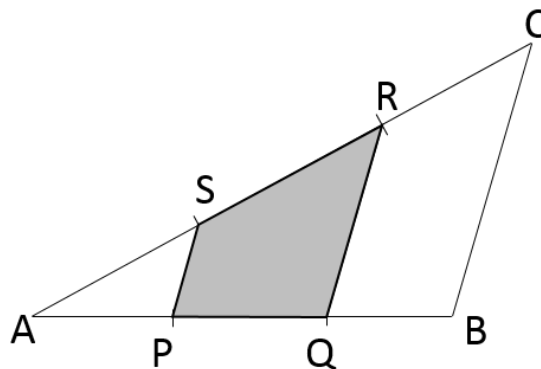
The triangle problem

Solve the following problem. Can you find different ways to solve the problem? Note all ways that you can find.

Given is an arbitrary triangle:

The points P , Q resp. R , S divide the sides AB and AC into three equal line parts.

How big is the area of the grey quadrilateral in comparison to the area of the whole triangle?



This problem was used in this form also in the project MBF₂. See Schindler, Joklitschke, and Rott (2018) for a project description.

References

- Leikin, R. (2009). Exploring mathematical creativity using multiple solution tasks. In R. Leikin, A. Berman, & B. Koichu (Eds.), *Creativity in mathematics and the education of gifted students* (pp. 129–145). Rotterdam, the Netherlands: Sense.
- Novotná, J. (2017). Problem solving through heuristic strategies as a way to make all pupils engaged. In B. Kaur, W. K. Ho, T. L. Toh, & B. H. Choy (Eds.), *c* (Vol. 1, pp. 29–44). Singapore: PME.
- Schindler, M., Joklitschke, J., & Rott, B. (2018). Mathematical creativity and its subdomain-specificity. Investigating the appropriateness of solutions in multiple solution tasks. In M. Singer (Ed.), *Mathematical creativity and mathematical giftedness. Enhancing creative capacities in mathematically promising students* (pp. 115–142). New York: Springer.