605 - Stacking Toblerone 9pcs

MATHS / COMBINATORICS

Erasmus+

TEACHER

Logifaces

DESCRIPTION

Students stack all the blocks in the 9 pcs Set into a regular prism then consider the number of different stackings (two packings are different if the order of the elements is different).

SOLUTIONS / EXAMPLES

$5! \times 2^2 = 480$.

DETAILS Each stacking has 4 fixed pairs: 112-122, 113-331, 123-123, 132-132 (see exercise 602 - Pairing 9pcs). The 4 pairs and the piece 222 have 5! permutations. In the pairs consisting of two different elements the order can be switched, that gives the factor 2^2.

ASSISTANCE FOR STUDENTS

First arrange the blocks into pairs! (This is exercise 602 - Pairing 9pcs.)
Calculate the number of the different orders of the 4 pairs and the block 222! (There are 5! permutations.)
In some pairs, the order of the blocks of the pair can be switched. Which pairs are these? (112-122 and 113-331)

PRIOR KNOWLEDGE

Basic exercises in combinatorics

RECOMMENDATIONS / COMMENTS

This is a difficult Combinatorics problem.

Exercise 602 - Pairing 9pcs is recommended before this exercise.