608 - Four Block Triangles
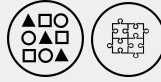
MATHS / COMBINATORICS

DESCRIPTION

Using the 9 pcs Set, students find the number of possibilities of arranging blocks in the form shown in the diagram with a continuous surface. (We say that two arrangements are the same, if they can be rotated into each other.)
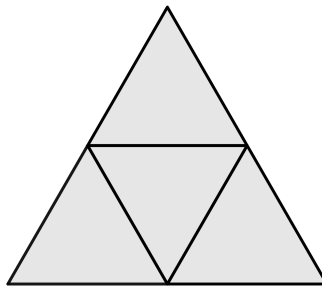
LEVEL 1   Let block 112, 113 or 122 be in the middle. How many arrangements are there with this fixed middle block?

LEVEL 2   Let block 123 or 132 be in the middle. How many arrangements are there with this fixed middle block?

LEVEL 3   Count the number of arrangements for all possible middle blocks.
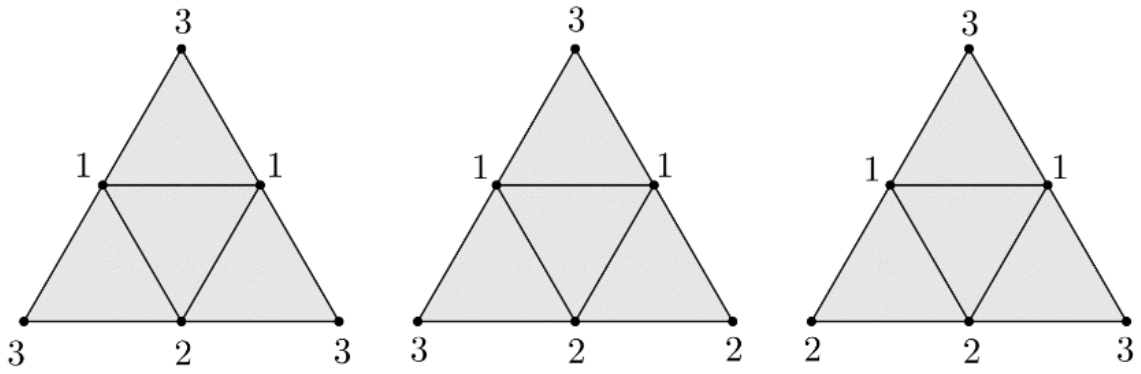
SOLUTIONS / EXAMPLES

There are 25 arrangements altogether.

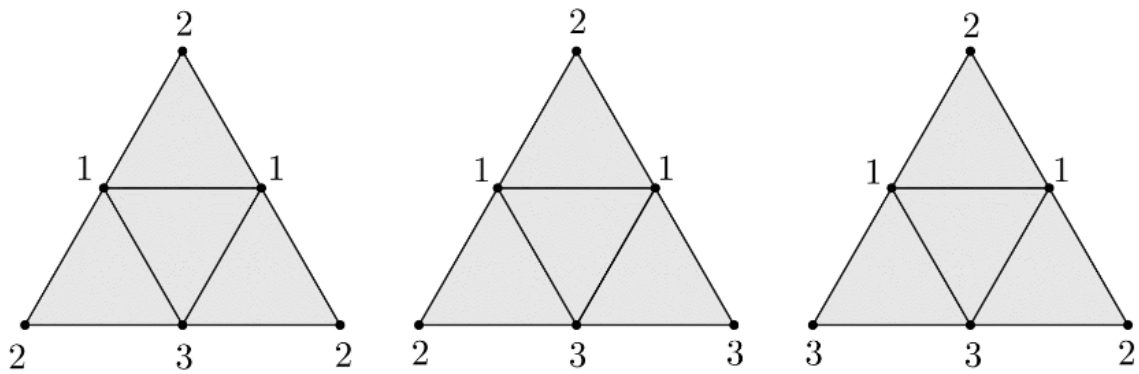Blocks 222, 331 cannot be in the middle, the others can (see exercise 607 - Block in the Middle).

Number of arrangements by the block in the middle (block in the middle - number of arrangements):

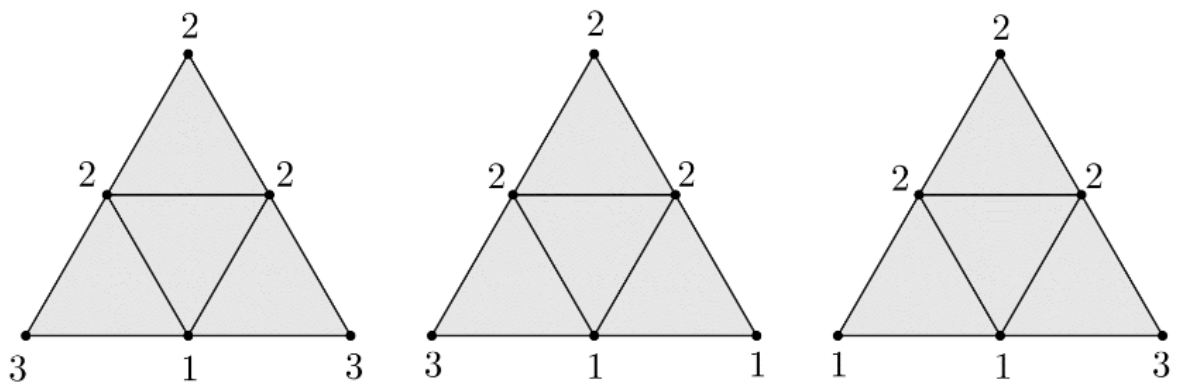112 - 3, 113 - 3, 122 - 3, 123 - 8, 132 - 8, see the Figures.

112 in the middle: 3 arrangements

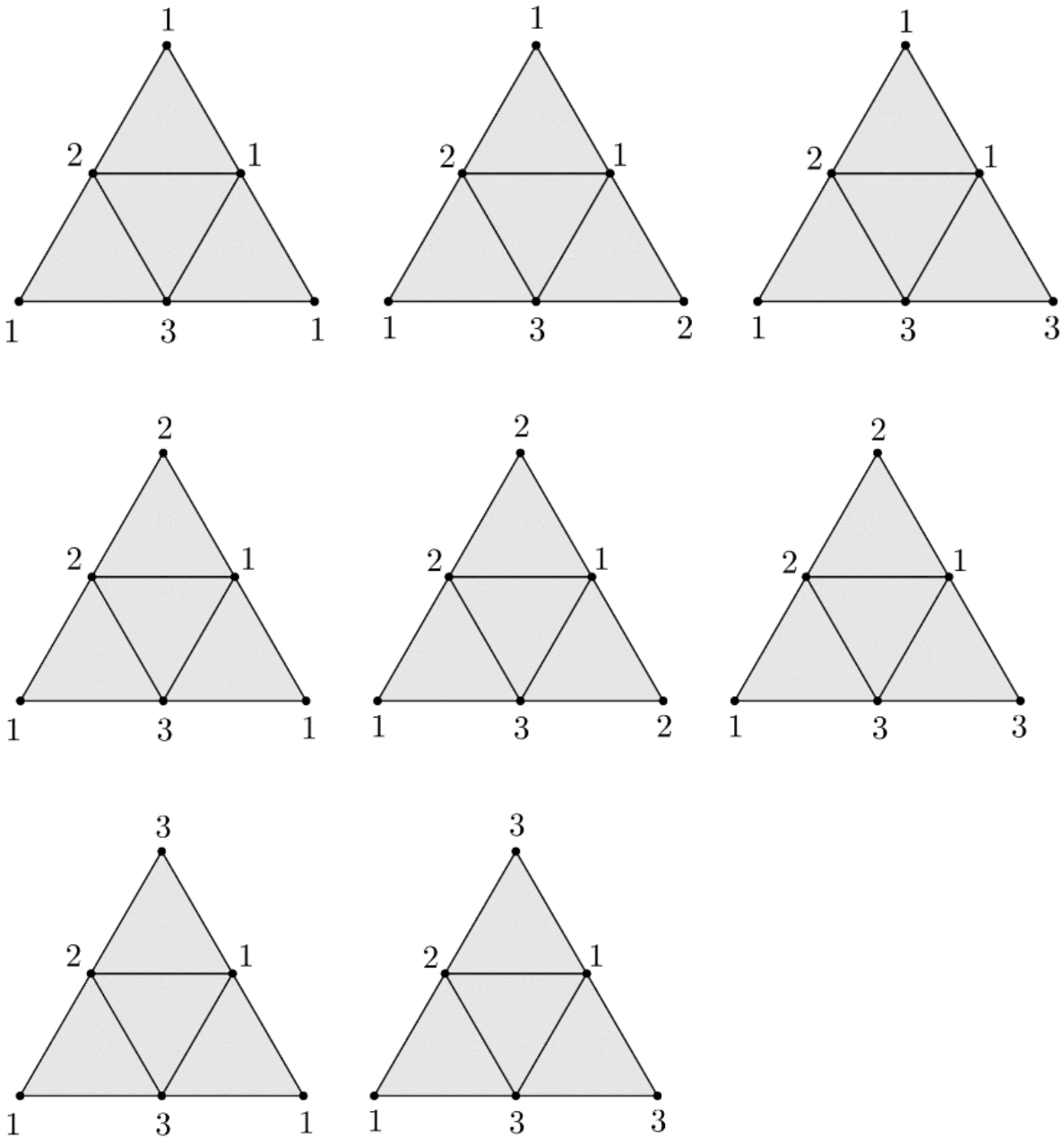113 in the middle: 3 arrangements

122 in the middle: 3 arrangements

123 in the middle: 8 arrangements
Arrangements with 132 in the middle are the reflexions of these arrangements.

RECOMMENDATIONS / COMMENTS

We recommend exercise 607 - Block in the Middle before this exercise as a warm up.

Tasks with different blocks fixed to be in the middle can be given to different students/groups.