Grades 11-12 (AS)

Duration: 15 min

Tools: one 16 pcs Set / group

Individual / Group work

Keywords: Probability, Favourable outcome, Total outcome

619 - Probability of Given Height

MATHS / PROBABILITY

LOGIFACES METHODOLOGY
Erasmus+
TEACHER
Logifaces

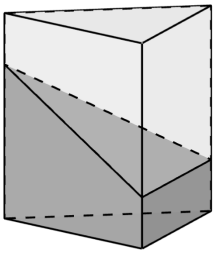
2019-1-HU01-KA201-0612722019-1

DESCRIPTION

Students put aside the repeated blocks of the 16 pcs Set and work with the remaining 10 blocks. They choose two blocks at random and find the probability that the selected pair of blocks can be joined to form a regular prism of

- height 5

- height 4 (For example the blocks 113 and 331 are chosen, see the figure.)



SOLUTIONS / EXAMPLES

As there are 10 different blocks in the 16 pcs Set, the total number of outcomes is the number of ordered pairs, which is $10 \times 9 = 90$.

For the first question, the favourable outcomes are (223, 332) and (332, 223), hence the probability is $\frac{2}{90} = \frac{1}{45} \approx 0.0222$.

For the second question, the favourable outcomes are (111, 333), (333, 111), (113, 331), (331,113), (112, 233), (233, 112), (122, 223) and (223,122), hence the probability is $\frac{8}{90} = \frac{4}{45} \approx 0.0889$.

Note that the blocks 123 and 132 do not form a prism.

The questions can be answered also by considering unordered pairs. In that solution, the probabilities are the same, but the total outcome is 45, and the numbers of the favourable outcomes are 1 and 4, respectively.

PRIOR KNOWLEDGE

The traditional model of probability

RECOMMENDATIONS / COMMENTS

Exercise 603 - Pairing 16pcs is recommended before this exercise to find the possible pairs of blocks that can be combined into a regular prism of height 4.