Name:

Date:

Tools: one Logifaces Set / 2-3 pairs or 4-6 students

537 - Ratio of Heights

MATHS / TRIGONOMETRY

LOGIFACES METHODOLOGY

Erasmus+

STUDENT

Logifaces

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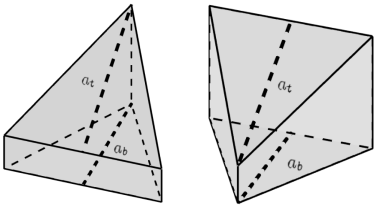
DESCRIPTION

In the 9 pcs or 16 pcs Set students choose those blocks that have two vertical edges with the same height and one with different height. These are blocks 112, 113, 122, 133, 223 and 233.
They denote the altitude of the base triangle by a_1 and the altitude of the top triangle starting from the vertex of the different height by a_t. The following connection holds between the angle of the planes of the top and base triangles (α) and the altitudes a_b and a_t:

$cos(\alpha) = \frac{a_b}{a_t}$.



LEVEL 1 Students use this formula to complete the table below. The two altitudes can be measured or calculated (see exercise 411 - Area of Triangles for the calculated values), the angle in the last column (with grey background) can be found using the formula above .

Block	a_b	a_t	α
112			
113			
122			
133			
223			
233			

LEVEL 2 Students prove the formula $cos(\alpha) = \frac{a_b}{a_t}$.

HINT Use the fact that both triangles have an edge that is parallel to the common line of the two planes and the heights a_b and a_t are perpendicular to that edge. In fact, the proof works for any triangle with this property.

SOLUTION(S)