Project Number: 2021-1-ES01-K220-SCH-000034434

PR2.A – TEACHING SOURCES

Title	TETRAGLE RATING: $(a+b)^2 = a^2 + 2ab + b^2$
Duration	1 session
Age Group	14-15
Dimension of the advised group of students	15 - 20 students, divided in 5 groups
Area	☐ *Area 1: Reading, writing and literature* ☒ *Area 2: Math* ☐ *Area 3: Second language learning* ☐ *Area 4: Sciences and geography* ☐ *Area 5: Soft skills*
Specific objectives	*The mathematics course should be accessible and enjoyable to all students. Through observation and interaction, students should be able to discover and understand that $(a+b)^2$ differs from a^2+b^2 and ultimately deduce what $(a+b)^2$ equals.* *The students' cooperation in groups, observation, observation skills, the observation, reflection, the discovery method and critical thinking help* *The students' understanding and achievement of the objective of the lesson.*
Needed Materials	Computer or laptop, internet, notebook and pen
Software	*The activities are carried out online and students can take notes if they wish.*
Description	*Students are asked to find out whether the representations $(a+b)^2$ and a^2+b^2 are equal or unequal. At the end they should be able to prove that the equality $(a+b)^2 = a^2 + 2ab + b^2$ holds for any values of a and b. They have the opportunity to find out in two ways either algebraically or geometrically.*
Procedure on how to put in practice	*Students who choose the geometric mode are given two activities. In the first activity they are given three squares with sides a, b and $(a+b)$ respectively, where a and b are positive numbers. First, they calculate the area of each square and observe whether the sum of the areas of the side squares a and b respectively, where a and b are positive numbers, equals the area of the side square $(a+b)$. They experiment by moving the two cursors a and b that change the sides of the squares and record their findings.* *In the second activity, students can move points E, A, B and observe what happens. Discover geometrically what the representations a^2, b^2, $a\cdot b$, $(a+b)^2$ express, and what the representation $(a+b)^2$ equals. In algebraic mode, students are asked to give various values to a and b and to test whether the equality $(a+b)^2 = a^2 + 2ab + b^2$ holds for any value of a and b. Finally, they can prove the equality by doing operations in their notebook:* *$(a+b)^2 = (a+b)\cdot(a+b) = \ldots$* *The identity $(a+b)^2 = a^2 + 2ab + b^2$ is proved!*
Link	https://photodentro.edu.gr/v/item/ds/8521/1890

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