Perfect Triangle Research and Exploration of Expansion to Four Dimensions with Using Code Design

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The contents of the partial fractions contained in high school textbooks are presented in the form of formulas, and there is no explanation of the meaning. When we learn mathematics, formulas are often understood only as convenience in calculating expressions, and they do not often understand and think deeply about their meaning. Therefore, it is intended to think about the meaning of the partial fraction expression and use it to study the perfect triangle and expand it to the dimension. In this process, it is planning to conduct a convergence study of AI and SW utilization capabilities and mathematics required in the era of the fourth industrial revolution by utilizing computer code design.The research procedures are as follows. 1) Partial fraction study 2) Perfect triangular study 3) If the outer width and volume are the same for three-dimensional cubes, study 4) If 4D Surface Area and Volume are the same 5) Using code design, study the number of cases in 2D, 3D, and 4D In addition to understanding the expression of partial fractions only as a formula, the idea of representing fractions as the sum of smaller fractions allowed us to study perfect triangles. Using the meaning of the fractional fraction and Heron's formula, five fully triangular cases could be found. In addition, the code design directly identified the five perfect triangles. Furthermore, the idea in two dimensions was identified in 10 three dimensional cubes, and the four-dimensional figure identified the number of 108 cases. This research is expected to serve as a springboard for convergent academic research in the era of the Fourth Industrial Revolution, which requires AI, SW capability in the future.

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