PROCEEDINGS OF THE 47th CONFERENCE OF THE INTERNATIONAL GROUP FOR THE PSYCHOLOGY OF MATHEMATICS EDUCATION

Auckland
Aotearoa New Zealand
July 17-21
2024

EDITORS

Tanya Evans
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VOLUME 1

Plenary Lectures
National Presentation
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Working Groups
Seminar
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Poster Presentations

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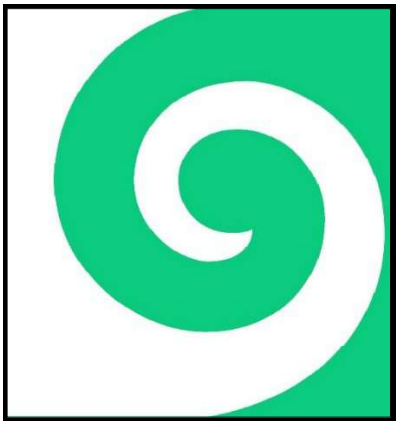

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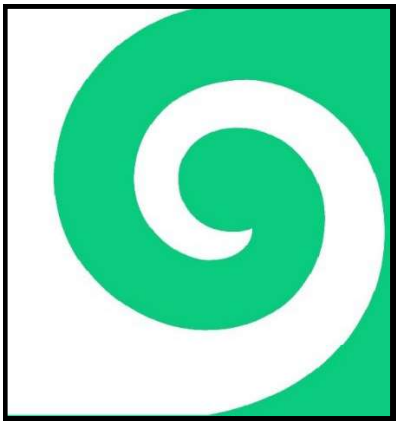

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RETHINKING MATHEMATICS EDUCATION TOGETHER

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TEACHING AND LEARNING THE DERIVATIVE TO FUTURE COMMERCIAL ENGINEERS

Maritza Galindo Illanes[1], Adriana Breda[2], Gemma Sala-Sebastià[2], and Vicenç Font[2]

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Several studies concerning the complexity of its meanings, its multiple representations, the teaching and learning processes, the suitability of the meaning of the derivative in the different curricula and the partial meanings in university teaching texts for engineering (Galindo Illanes & Breda, 2023). Working on the different meanings of a mathematical object is an aspect proposed by the Ontosemiotic Approach (Godino et al., 2007) to achieve a better understanding and competence of students in solving a greater variability of problems, which proposes to analyze the complexity of mathematical objects through their many meanings (partial meanings). Based on the above, this paper aims to present the results of a teaching and learning process of the derivative with future commercial engineers, which considers diverse epistemic configurations in the situation-problems on tangents, the calculation of derivative following derivative rules, applications of the derivative for the calculation of maximum and minimum and analysis of function graphs.

The research involved 90 commercial engineering students from the Faculty of Economics and Business of a Chilean university. For this study, three types of problem fields were considered: tangents; the calculation of the derivative from their rules and theorems; and applications of the derivative for the calculation of maximums and minimums, and analysis of function graphs. The results show that the students who participated in this implementation, although they presented some limitations, such as difficulty in sketching the utility function or the application of the derivative for decision-making, learned the relationship between the tangent to a curve and the geometric interpretation of the derivative and the application of the derivative in marginal analysis, showing, in addition, an improvement in the construction of the Cartesian conception of the tangent line.

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