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Analysis of Engineering Students' Understanding in Differentiate Derivative and Integral

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Abstract

Derivative and integral are such fundamental concepts for Engineering students for their advanced coursed. These two concepts are opposite each other, since Integral as an antiderivative of a function $f(x)$ is a function, whose derivative is equal to $f(x)$. However the Engineering students still confused to identify the difference between derivative and integral. This study aimed to examine how students distinguish the understanding between derivative and integral in a sample of second-year aerospace engineering students in one of the private universities in Yogyakarta, Indonesia, and how they solve it. These two concepts have been taught in their high School and first-year in university. The instrument of this study applied the same problems for two questions, to derived and also to integrated, in order to find students understanding in distinguishing the concepts. Qualitative research was chosen as it can describe the students thinking in answering the test. The result reveals how students differentiate solving Derivative and Integral. One-third of these students do not use the symbol of derivative or integral in solving the question. Most of them just use one symbol, which the majority is derivative, the rest do not use any symbol. Using symbol helps students to answer correctly when dealing with two opposite concepts such as derivative and integral. Thus, conceptual and procedural understanding play a further important role. Integral procedures appear to be avoided because of the complex formulas that involve fractions.