

LEARNING GUIDANCE BASED ON THE OVERLAP SINGULARITY PHENOMENON

TOMOHIRO WASHINO

SHINYA OHASHI

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ABSTRACT. In the study of mathematics, when the concepts of two items share a common concept, understanding the relation between them can lead to a deeper understanding. In this paper, our focus is on the process of understanding the concepts of “permutation” and “combination” as found in the unit “permutations and combinations” in the high school mathematics curriculum. Particular attention is paid to the phenomenon of “overgeneralization,” which is one of the reasons that students make mistakes. A mathematical modeling of loss surfaces is applied using neural networks and a simulation of overlap singularity, one of the singular regions based on overgeneralization, on the surfaces. Findings from this analysis are used to formulate learning guidance for teachers of mathematics.