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Title: Understanding calculus beyond computations: A problem of content and for evaluation

Calculus is an important tool for building mathematical models of the world around us and is thus used in a variety of disciplines, such as physics and engineering. These disciplines rely on calculus courses to provide the mathematical foundation needed for success in their courses. Unfortunately, due to the parallel nature of the calculus taught, many students leave their calculus course(s) with an understanding misaligned with what is needed in the discipline courses and are thus ill-prepared. By working with presumed experts (undergraduate mathematics and other discipline faculty members), this study developed a small number of prototype tasks that elicit, document, and measure students' understanding of a few calculus concepts the faculty participants believe to be essential to successful academic pursuits within their respective disciplines. This manuscript details the data and analysis from the three cycles of data collection. Implications of this research for calculus instruction and curriculum are mentioned.