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Student understanding of calculus within physics and mathematics classrooms[1] WARREN CHRISTENSEN, North Dakota State University, JOHN THOMPSON, University of Maine — The earliest results in Physics Education Research demonstrated the challenges facing students in understanding the graphical interpretations of slope, derivative, and area under curves in the context of kinematics. As part of ongoing research on mathematical challenges that may underlie documented physics difficulties, we developed and administered a brief survey on single- and multivariable calculus concepts to students within physics and mathematics classrooms at both the introductory and advanced levels. Initial findings among students in multivariable calculus show that as many as one in five students encounter some type of difficulty when asked to rank the slopes at five different points along a single path. We will present further data on the extent to which students in a first semester calculus course and an introductory calculus-based physics course encounter similar challenges.

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