

**ZMATH 2016c.00527**

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**A characterization of Calculus I final exams in U.S. colleges and universities.**

Int. J. Res. Undergrad. Math. Educ. 2, No. 1, 105-133 (2016).

Summary: In this study, we developed a three-dimensional framework to characterize post-secondary Calculus I final exams. Our *Exam Characterization Framework* (ECF) classifies individual exam items according to the cognitive demand required to answer the item, the representation of both the task statement and the solution, and the item's format. Our results from using the ECF to code 150 post-secondary Calculus I final exams from across the United States revealed that the exams generally require low levels of cognitive demand, seldom contain problems stated in a real-world context, rarely elicit explanation, and do not require students to demonstrate or apply their understanding of the course's central ideas. We compared the results from analyzing individual instructor's exams with survey data of their beliefs about the conceptual orientation of their exams. Our analysis revealed inconsistencies between our characterization of Calculus I final exams and instructors' perceptions of their final exams relative to their conceptual focus and the extent to which the exam items ask students to explain their thinking. We also compared the characteristics of our sample of final exams with post-secondary Calculus I final exams administered in 1986/87. We found that Calculus I final exams in U.S. colleges and universities have changed very little in the past 25 years with respect to the percentage of exam items that require students to apply their understanding of foundational concepts, which suggest that the calculus reform movement of the late 1980s has had little effect on what is being assessed in current Calculus I courses in U.S. postsecondary institutions.

*Classification:* D65 I15

*Keywords:* calculus; assessment; mathematical reasoning; university level mathematics

doi:10.1007/s40753-015-0023-9