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"Points"-less Calculus

After a set of meetings outlining a set of both content and process learning goals, the calculus 1 instructors decided to reinvent our course. In order to address notions that math problems can be solved "quickly," we implemented long group-based labs, and made all homework problems context-based. In order to encourage students to revisit and revise prior work, all work would be graded as either correct or incorrect, with no partial credit, allowing for revisions. This was implemented as a part of a specifications/standard based grading scheme, which allowed for grading to be based on specific numbers of tasks accomplished. The homework problems were each designated with learning goals which were provided to the students so they could record which of the learning goals had been completed. This allowed for a much higher degree of transparency in assessment, allowing students to see and participate in the process of analyzing their learning throughout the course. In order to ensure that these changes were not made at the expense of procedural fluency, two gateway exams were created, which students were able to retake until they were successful. To address student beliefs about the nature of mathematics, bi-weekly readings on topics such as growth mindset were assigned for reflection and were discussed during class. In the talk, we will discuss the changes we made, including examples, as well as the results we have seen so far, and initial student impressions, as well as how we envision changing the course in subsequent semesters.