## Assessment Instrument(s):
1a. Rubric from Math 101 (College Algebra) on student performance on four essential learning outcomes: Computation, Methodology, Representation, Interpretation

1b. Examination of achievement levels of outcomes for calculus bound students vs. non-calculus bound students

2. Results of gateway exam with ten essential concepts for students progressing from Calculus I to Calculus II

## Assessment Results:
1a. Assessment results from MATH 101 indicate that the majority of the students (nearly 70%) have achieved at least the basic competency in College Algebra, but had difficulty grasping the third concept, “Representation,” where 45% of the students failed to achieve the expected learning outcomes (see Table 1 of attached report).

1b. Non-calculus-bound students (i.e. who will take a statistics or a topics course as a second level math course) have more challenges in achieving the learning outcome, and are four times more likely to withdraw from the course than students who expect to take calculus.

2. Students in Calculus I must pass the gateway exam in order to progress to Calculus II. The exam tests ten concepts (see Table 2). We found that students had the most trouble with Concept 9: Compound Problems. Figure 2 shows that pass rates vary by modality of test (online or in class).

## Explain how your institution makes use of the assessment results:
1. Our examination of performance on essential outcomes in College Algebra has led us to develop and pilot a data-driven College Algebra course. This course has the same essential learning outcome but takes a more data analytic approach to the material. We continue to analyze the success of this new approach to non-calculus bound students, but early signs are that students engage more with the material and succeed at a higher rate (77% attainment of skills in data driven sections vs. 64% attainment in traditional sections, see Figure 1).

2. For the more difficult concepts in the calculus gateway exam, we are examining ways to provide more tutoring help and practice in compound problems. In addition, we are re-structuring the calculus sequence to be a three-course sequence; this should help to provide the instruction that students need in these more complex areas in addition to being more in line with the calculus sequences in the state and across the country. Ultimately, this will help students be able to transfer in calculus courses and be successful as they progress through the sequence.

## Comments:
The assessment of student learning reported here will allow us to adjust instruction in both Math 10 College Algebra and Math 121 Calculus I to emphasize the specific concepts that students have the most difficulty with. Additional practice opportunities, such as assignments and group work, will be used to pinpoint students' learning barriers and offer students concrete feedback for improvement.
Please see full report, attached, for more information.