

**Changes Resulting from Assessment of General Education Mathematics**  
**“Closing the Loop”**  
**February 2010**

During the fall 2008 term, OIT conducted an assessment in general education mathematics. The full report for this institutional student learning outcome (ISLO) is available at [www.oit.edu/provost/islo/reports](http://www.oit.edu/provost/islo/reports).

The Math Department and the Executive Committee of the Assessment Commission identified two areas in student learning that warranted focused efforts for improvement. These two areas were 1) student performance in graphical comprehension in Math 111, College Algebra, and 2) student performance in interpreting math results in Math 361, Statistical Methods I.

**Math 111**

The math faculty developed performance criteria for graphical comprehension in Math 111 in spring 2009. At the start of the fall 2009 term, all faculty teaching Math 111 were reminded of the criteria, and the assessment process was repeated for graphical comprehension at the end of the fall 2009 term. The faculty devised five questions that were included in final exams for six sections of Math 111. The results for this re-assessment are shown below in Table 1.

<b>Term of Assessment</b>	<b>Percent of students performing at proficiency or higher</b>
Fall 2008	54.6
Fall 2009	58.7

Table 1. Assessment of graphical comprehension in Math 111

The math faculty examined the re-assessment data for graphical comprehension, and they felt that the results were no better than last year overall. To explore the data further, the faculty analyzed each of the five exam questions individually. While the faculty has not yet decided on acceptable proficiency standards, they generally felt that the results from the first, second and fifth test items were lower than desired.

The first two test items were related to evaluating a function from its graph. Although all department members address these concepts in class lectures, the textbooks do not support the agreed-upon performance criteria. Additionally, most members of the department did not include similar questions of this nature on any quizzes or hour exams. The math faculty agreed that in the fall 2010 term each person teaching Math 111 will include similar questions on either a quiz, hour exam, or both. The department will then reassess these items again on fall 2010 final exams.

For the fifth item, on the graph of an inverse function, the faculty decided that initial efforts will focus on trying to determine what caused the difficulty for the students. One department member suggested that students might do better if the question was not a multiple choice question. Several instructors intend to use the same question, but not in multiple choice format, during the winter 2010 term, and then compare those results with the fall assessment results to see if that could in fact have been the difficulty. This item will also be re-assessed in fall 2010.

### **Math 361**

The math faculty also developed performance criteria for interpreting math results in Math 361 in spring 2009, including examples of problems for each criterion. The department focused on math interpretation through class discussion and assigned problems. At the start of the fall 2009 term, all faculty teaching Math 361 were reminded of the criteria, and the assessment process was repeated for interpreting math results at the end of the fall 2009 term. The faculty devised three questions that were included in the finals for four sections of Math 361. The results for this re-assessment are shown below in Table 2.

<b>Term of Assessment</b>	<b>Percent of students performing at proficiency or higher</b>
Fall 2008	55.5
Fall 2009	67.2

Table 2. Assessment of interpreting math results in Math 361

The math faculty felt that the results from this year are clearly better than those from last year. This was most likely due to the attention given by those teaching 361 to the particular performance criteria. Efforts in this area will continue, as it is felt that the interpretation of results is an important performance criterion.

The Executive Committee of the Assessment Commission reviewed these results and concur with the Math Department.

The next full assessment of general education mathematics is scheduled for the 2011-12 academic year.