Assessment Data is from what semester? ___Spring 2014_____________________

Faculty Name(s): ___Andy Bloom_______________________________________________________

1. Course Name and Number:
Math 188

2. List all Course SLOs from the Course Outline of Record:
Upon Successful completion of this course, students will be able to:
1. Manipulate algebraic and transcendental functions at the mastery level.
2. Solve equations involving algebraic and transcendental functions, and systems of equations at the mastery level.
3. Use algebraic and transcendental functions for mathematical applications at the intermediate level.
4. Analyze the qualitative behavior of the graphs of algebraic and transcendental functions at the intermediate level.
5. Use technology to graph algebraic and transcendental functions at the intermediate level.

3. Specific Course SLO(s) assessed as part of this project:
4. Analyze the qualitative behavior of the graphs of algebraic and transcendental functions at the intermediate level.

4. Is this course on GE Plan A? _X___Yes   ____ No (See Catalog pages 49-51 & page 55)
If Yes, identify what area. (All GE course assessments count as GE assessments.)
___Area I Natural Sciences
___Area II Social and Behavioral Sciences
___Area III Fine Arts/Humanities
X_Area IV Language and Rationality
___Area V Physical Education/Wellness
___Area VI Intercultural/International Studies
___Area VII Information Competency

5. How did you assess the SLO(s)? (Attach any related documents at end of form.)
Students were asked a variety of questions over the course of the semester on tests and assignments that required them to analyze the behavior of the graph of a function. A summary list of the assessed questions is at the end of this form.
6. Results and analysis of the data. (Attach any related documents at end of form.)

Questions were asked in three forms:

1. Those that required students to evaluate behavior of a function when given a graph (Questions 1-3 attached)
2. Those that asked students to determine how the graph of the function would be altered by changing the function (Questions 4-5)
3. Those that asked students to determine information about the graph when given the function. (Questions 6-10)

In general, students did well on these questions. The questions were split between assignments, chapter tests, and the final exam. Students were encouraged to seek help on the assignment questions from the instructor, the tutors in the math lab, or other students in the class. Many students sought help and clarification from the instructor.

Course data:
30 students completed the course and received a grade.
27 students received grades of A, B, or C, 1 student received a D, 2 students received an F in the course.
Of the 4 questions asked on assessments, 75% were answered successfully.
Of the 6 questions asked on exams, only 54% were answered successfully.

It is important to note that those questions asked on assignments were not repeated on exams, although there was conceptual carryover between the two. Understanding the concept on the assignment question would be very helpful in being able to answer the exam question successfully. Of the students who successfully answered the assignment question, 84% successfully answered the majority of the questions on the exams (more than 4 of the 6 exam assessment questions correct).

There was a strong correlation between those students who took the time and put forth the effort to understand the assessment questions that were asked on the assignments and those who were able to successfully complete the assessment on the tests. Students who did not take the time to understand the assessment questions on assignments were largely unsuccessful on exams. It was not enough to successfully complete the assignment questions, students needed to spend time on the material and take steps to understand it. Too many students were content to get the tutors to do the majority of the work or lean on a friend for help. I strongly encouraged students to use the assignment in preparation for the tests and gave each student who turned in the assignment the correct solution to the assignment problems. The majority of the successful students did this and it was reflected in their success in the assessment exercises and their grades in the course.

7. What are you going to do based on the results of the data? (Any planned revisions?)

I believe that creating challenging assessments that require students to fully understand a concept can greatly further their understanding and performance on exams. The evidence here seems to point in that direction; particularly the struggles exhibited by those students who chose not to complete the assignment or did not take the time to fully understand the work they turned in. I see two issues that will need to be addressed in the future. First, students need to successfully complete the assignment. At this time, each assignment is worth 15 points and I am hesitant to make it worth more. Because students can get help on the assignment, making it too valuable in the calculation of their grade will unnaturally inflate grades. Second, students need to understand the value in fully understanding the concepts of the assignment questions. I tell students that the questions are intentionally more difficult than they will see on the test and give them at least 5 days to complete the assignment (which are usually around 5 or 6 problems). Students who wait
until the last minute to attempt the assignment are rarely successful; nor are the students who do
not ask for help. I will continue to encourage students to work hard to understand the assignment
and not just complete it. It may be valuable to give students time on the day before the
assignment is due to collaborate in class. That would allow students who have begun to ask
questions and would allow students who have not begun to see where they should focus their
attention. Perhaps students would begin to see the need for steady, consistent work at completing
the problems and understanding the concepts.

Please save your finished document in the following format. (Date should be for the
semester in which data was collected; same date should be listed at top of this form.)

yyyysemester-sloa-courseid.doc
Example: 2014spring-sloa-engl101c.doc
1. Use the picture below to answer the questions. (Assignment)

![Graph](image)

a. Is the degree of the polynomial even or odd? How do you know?
b. Is the leading coefficient positive or negative? How do you know?
c. Is the function even, odd, or neither? How do you know?
d. How do you know that $x^2$ must be one of the factors of the function?

2. Write the equation of the function pictured: (Exam)

![Graph](image)

3. Use the following graph of $f(x)$ to draw the graph of $g(x) = 2|f(x)|$ (Exam)

![Graph](image)
4. Describe the transformations necessary to convert the graph for \( f(x) = x^2 \) into \( f(x) = -3(x - 4)^2 + 1 \) (Exam)

5. Describe the transformations for the function \( y = 0.25\sin(4x + \pi) \) (Exam)

6. What is the domain of the function \( f(x) = \frac{e^{|x|}}{1 + e^{-x}} \)? (Assignment)

7. A one lane highway runs through a tunnel in the shape of one-half of a sine curve. The opening is 28 feet wide at road level and 15 feet tall at its highest point. Find an equation for the sine curve that fits the opening. Place the origin at the left end of the sine curve. If the road is 14 feet wide and there is a 7 foot shoulder on either side of the road, what is the height of the tunnel at the edge of the road? (Assignment)

8. Determine the zeros, their multiplicity, and the end behavior of the function

\[
f(x) = -x(4x + 3)(x - 2)^2
\]

and then sketch the graph. (Assignment)

9. Is the function \( f(x) = \tan(x) - x^3 \) even or odd? (Final Exam)

10. Draw the graph of \( g(x) = \frac{2x^2 + 7x - 15}{x - 2} \) (Exam)

   a. What are the x-intercepts?
   b. What is the y-intercept?
   c. Give the equation of any vertical asymptotes.
   d. Give the equation of any horizontal or oblique asymptotes.