### SLO #2 Solving Equations and Manipulating Expressions
- Students will be able to use numerical and symbolic representations to correctly perform operations (addition, subtraction, multiplication, division, exponentiation, factoring, and order of operations) on non-negative real numbers to simplify expressions.
- **Course SLO Status**: Active
- **Course SLO Assessment Cycle**: 2013-14 (Spring 2014), 2017-18 (Spring 2018)
- **Input Date**: 11/20/2013

**Exam/Test/Quiz** - The planned SLO is a common topic in arithmetic: Order of Operations. An arithmetic problem with 5 operations was presented to students; they were given points based on the proportion of operations they performed in the correct order.

**Assessment:**
- Solve by describing each step following the proper order of operations:
  - **Step 1:**
  - **Step 2:**
  - **Step 3:**
  - **Step 4:**
  - **Step 5:**

**Final Answer:**

### Standard and Target for Success:

<table>
<thead>
<tr>
<th>Assessment Method Description</th>
<th>Results</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exam/Test/Quiz</strong> - The planned SLO is a common topic in arithmetic: Order of Operations. An arithmetic problem with 5 operations was presented to students; they were given points based on the proportion of operations they performed in the correct order.</td>
<td><strong>Math 12 Sp14</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>Pass SLO</strong></td>
<td>206</td>
<td>29</td>
</tr>
<tr>
<td><strong>Not Pass SLO</strong></td>
<td>57</td>
<td>29</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>263</td>
<td>79</td>
</tr>
</tbody>
</table>

**Semester and Year Assessment Conducted**: 2013-14 (Spring 2014)

**Pass Course**

| **Pass SLO** | 0.60 | 0.08 | 0.69 |
| **Not Pass SLO** | 0.17 | 0.15 |
| **Total** | 0.77 | 0.23 | 1.00 |

The results are generally positive: 60% of students passed the SLO and the course which is a decent outcome, more impressive is that 69% of all students passed the SLO regardless of their grade in the course, and what is also encouraging is that only 15% of students failed both SLO and the course.

There is room for improvement, but these results are not bad and this seems to be a topic most students are
<table>
<thead>
<tr>
<th>Course SLOs</th>
<th>Assessment Method Description</th>
<th>Results</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standards or Rubric</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 points  The solution is completely correct in its entirety and the student has demonstrated a full understanding of the concepts involved (a) used notation correctly (b) has clearly shown all the steps (c) made no algebraic errors</td>
<td></td>
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<tr>
<td></td>
<td>2 points  The solution demonstrates some conceptual understanding of the skill or concept involved, but has not thoroughly mastered it. One or more major errors are present in the solution: (a) not completely answering the question (b) not using consistent notation (c) making multiple errors in computation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 points  The solution demonstrates minimal conceptual understanding of the skill or concept involved. One or more major errors are present in the solution: (a) not completely answering the question (b) showing confused reasoning (c) not using consistent notation (d) making multiple errors in computation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 points  No solution presented</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A passing grade is a grade of 2 or greater. The target for success is 65%: If 65% of students pass this SLO we will consider this SLO successful.

Faculty Assessment Leader: Art Martinez
Faculty Contributing to Assessment: G. Scott, V Tim, B Bayssa, T Huang, W Chen, V Avakyan, A Yu, J Gill, G manikandan, D Roach, O Avanassian
Related Documents: SLO SP14 MATH 12.xls.doc

Exam/Test/Quiz - The assessment Semester and Year Assessment Conducted: 2017-18
Action: Continue to share teaching
<table>
<thead>
<tr>
<th><strong>Course SLOs</strong></th>
<th><strong>Assessment Method Description</strong></th>
<th><strong>Results</strong></th>
<th><strong>Actions</strong></th>
</tr>
</thead>
</table>
|                | tests the students' understanding of the Order of Operations with whole numbers and how adding parentheses can change the value of an expression. The problems were: Use the Order of Operations to Simplify the Expressions: 1) $9+12÷3·4$  2) $3(4+1)^2-2^2$  3) Add parentheses so the expression evaluates to 14: $24÷3·2+2·5$ **Standard and Target for Success:** The assessment consists of 3 questions. Students are considered to have passed this assessment by completing at least 2 out of 3 questions correctly. The goal is for at least 65% of the students to be successful. | (Spring 2018) **Standard Met?**: Standard Met  All fourteen sections of Math 12, with a total of 324 students, participated in this assessment. The number of questions answered correctly were recorded for each student. The following table shows the breakdown of scores:  
<table>
<thead>
<tr>
<th>Score</th>
<th>Number of Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>35</td>
<td>10.8%</td>
</tr>
<tr>
<td>1</td>
<td>66</td>
<td>20.4%</td>
</tr>
<tr>
<td>2</td>
<td>109</td>
<td>33.6%</td>
</tr>
<tr>
<td>3</td>
<td>114</td>
<td>35.2%</td>
</tr>
<tr>
<td></td>
<td>A total of 223 students or 68.8% answered 2 or 3 questions correctly. Instructors were asked how they felt about their students' results, 5 were pleased with the results, 8 felt that the students were doing ok and making progress, while only one was disappointed. Suggested teaching strategies included using PEMDAS (an acronym for simplifying by first working on Parentheses, then Exponents, then Multiplication &amp; Division, last Addition and Subtraction) as well as NOT using PEMDAS because it is confusing. Most of the suggestions were for more practice including working problems at the board, additional worksheets, word problems, group work and computer exercises. One instructor suggested more collaboration with other teachers. Individual instructors comments and results are in attached file. (09/11/2018)</td>
<td><strong>% of Success for this SLO</strong>: 68.8  <strong>Faculty Assessment Leader</strong>: Anna Hockman  <strong>Faculty Contributing to Assessment</strong>: Alexander Bojkov, Abdel El Abyad, Dominic Fanelli, Jack Gill, Laura Hinckley, Matin Lackpour, Terri Malouf, Ashod Minasian, Miguel Ornelas, Aida Ovanessian, James Wan, Richard Wong  <strong>Related Documents</strong>: <a href="#">Math 12 SLO Results Spr 18.xlsx</a></td>
</tr>
</tbody>
</table>
### Course SLOs

**SLO #2 Solving Equations and Manipulating Expressions** - Students will use numerical and symbolic representations of mathematical ideas to simplify linear expressions and solve linear equations.  
**Course SLO Status:** Active  
**Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2017-18 (Spring 2018)  
**Input Date:** 11/20/2013

<table>
<thead>
<tr>
<th>Assessment Method Description</th>
<th>Results</th>
<th>Actions</th>
</tr>
</thead>
</table>
| **Exam/Test/Quiz - Sample Question:** Given:  
(i) \(4x + 3 = 8\)  
(ii) \(4x + 3 = 8\)  
A) Which of the above is a linear equation? Which is a linear expression?  
B) Simplify the linear expression.  
C) Solve the linear equation.  
**Standard and Target for Success:** Based on the rubric below, it is expected that 70% of the students will score 2 or 3 on this SLO.  
**GRADING RUBRIC** (problem worth a maximum of 3 points):  
Part (A) (worth 1 point)  
1 point (student correctly identifies which is an expression and which is an equation)  
0 points (student incorrectly identifies which is an expression and which is an equation)  
Part (B) (worth 1 point)  
1 point (student correctly simplifies the expression)  
0 points (student makes mistakes simplifying the expression, or treats expression like an equation)  
Part (C) (worth 1 point)  
1 point (student correctly solves the equation)  
0 points (student makes mistakes in solving the equation)  
| Semester and Year Assessment Conducted: 2017-18 (Spring 2018)  
Standard Met? : Standard Met  
- Number of students and sections participating in the assessment  
351  
- Number of students and percentage of students scoring at the different levels of the rubric  
<table>
<thead>
<tr>
<th>Score</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>163</td>
<td>46.4</td>
</tr>
<tr>
<td>2</td>
<td>105</td>
<td>29.9</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
<td>17.1</td>
</tr>
<tr>
<td>0</td>
<td>23</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| The percentage of students achieving a score of two or three was 76.3 which exceeded the standard met. Though many instructors felt that the student had met their expectations, a significant proportion felt that given the question, a higher number of students should have gotten a 2 or 3. Strategies for improving the scores include introducing the material earlier in the semester, repeating the lesson multiple times in different contexts.  
(09/13/2018)  
**% of Success for this SLO:** 76.3  
**Faculty Assessment Leader:** Oscar G Villareal  
**Faculty Contributing to Assessment:** Christina Watson, Ralph Taylor, Kaysa Moreno, Laura Hinkley, Aida Ovanessian, Tadele Gizaw, Tatiana Roque, Megan Granich, Christine Yang, Junko Forbes, Marilyn Cortez, Juan Martinez  
| Semester and Year Assessment Conducted: 2013-14 (Spring 2014)  
Standard Met? : Standard Met  
23 of the 26 sections of Math 23 participated in this SLO (sections 0192, 0196, 9734 did not).  
Here are the results:  
605 students in total were assessed  
Action: To raise the success target from 70% to 72%.  
(04/16/2015)  
**Action Category:** Teaching Strategies  
**Follow-Up:** While SLO #2 has not yet been re-assessed since this...
<table>
<thead>
<tr>
<th><strong>Course SLOs</strong></th>
<th><strong>Assessment Method</strong></th>
<th><strong>Description</strong></th>
<th><strong>Results</strong></th>
<th><strong>Actions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>solving the equation, or treats the equation like an expression)</td>
<td>54.9% (332) scored a 3 23.8% (144) scored a 2 12.9% (78) scored a 1 8.4% (51) scored a 0</td>
<td>Action was written, the following strategies are currently being implemented in order to reach this new success target: 1. Clearly identify the difference between an expression and an equation. Have students analyze problems as part of their classwork/homework in a manner similar to the SLO question. 2. Group work; constantly ask them to identify whether the problem is an equation or an expression. 3. Go over how an equation has an equal sign because the both start with 'equa.' Thus, an expression does not have an equal sign. 4. Student practice (in class and home), and periodic in-class review worksheets 5. When solving linear equations, teach students to write out the steps that they are doing, such as adding and subtracting to balance the equations. Keeping track of which step of the process the student is doing gives them a guide for solving the problem. (05/05/2015)</td>
</tr>
</tbody>
</table>

**Related Documents:**
Math 23 SLO sample problem

**Faculty Assessment Leader:** Megan Granich
**Faculty Contributing to Assessment:** J. Wan, M. Granich, T. Malouf, M. Formanes, A Stillson, L. Saakian, R. Taylor, R. Caldwell, R. Wong, F. Faridpak, E. Skorka, N. Bibb, A. Tatlılıglu (only completed 1 of 2 sections), T. Tran, D. Roach, A. Abbassi, R. Webb, S. Carter

20 instructors were pleased with the results, while 3 were not. (04/16/2014)

Therefore, 78.7% of those surveyed scored a 2 or 3 on this SLO. This exceeds the target of 70%.

Exam/Test/Quiz - Given:
(i) 4x + 3 = 8
(ii) 4x + 3 = 8
<table>
<thead>
<tr>
<th>Course SLOs</th>
<th>Assessment Method Description</th>
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<th>Actions</th>
</tr>
</thead>
</table>
|             | A) Which of the above is a linear equation? Which is a linear expression?  
B) Simplify the linear expression.  
C) Solve the linear equation. |         |         |
|             | **-Grading Rubric**  
Score of 3: Student solves the problem completely and correctly.  
Score of 2: Gets A wrong but is able to solve B) and C) correctly.  
or gets A right and solve one of B) or C) correctly.  
Score of 1: Gets A wrong and is able solve only one of B) or C) correctly.  
Or gets A right and solves both B) and C) incorrectly.  
Score of 0: Gets A wrong and is unable to simplify/solve both expression/equation correctly. |         |         |

**Standard and Target for Success:**  
70% of students are expected to score 2 or 3.
## SLO #2 Solving Equations and Manipulating Expressions
- A student will be able to demonstrate the ability to identify and correctly implement techniques to symbolically solve equations, with an emphasis on linear equations, and manipulate expressions.

**Course SLO Status**: Active  
**Course SLO Assessment Cycle**: 2013-14 (Spring 2014), 2017-18 (Spring 2018)  
**Input Date**: 02/26/2015

### Exam/Test/Quiz - Math 37 includes an online component where students are required to complete quizzes via the My Math Lab Pearson Publishing software. The Spring 2014 SLO was assigned as an online exam with 9 linear equation problems using integer and rational coefficients.

The 9 problems are given below:

1. \(-9 = x + 7\)
2. \(-8x - 4x = -7\)
3. \(x + 5y = 20\)
4. \(7x = 33 + 4x\)
5. \(6 - 4x = -8x + 18\)
6. \(5x - 7 - 3x = 3x - 2\)
7. \(5(5x - 3) + 10 = -3\)
8. \(-3(x + 2) + 4 = 5(x + 3) + 6\)
9. \((x - 7)/3 = 1 - x/7\)

**Standard and Target for Success:**
- Where the typical SLO is a single problem, we chose to assess 9 problems, where one included fractional coefficients and another problem included multiple variables. Considering the degree of difficulty of this SLO we felt a passing grade should be getting 6 of these 9 problems correct.

Our target for success was for 2/3 of our students to pass this SLO.

### Exam/Test/Quiz - Student will

**Semester and Year Assessment Conducted**: 2013-14 (Spring 2014)  
**Standard Met?**: Standard Met

We considered a passing grade to be the case where a student correctly answered 6 of the 9 problems in the SLO.

**Results:**
- a) 73% of our students correctly answered 6 of the 9 problems.
- b) the average grade was a 72%, the median was 78%
- c) 137 students were surveyed
- d) the standard deviation was 20%
- e) 12% of our students received a score of 100%

The target goal was met. We are very satisfied with the results of this SLO. (05/11/2014)

**Faculty Assessment Leader**: Art Martinez  
**Faculty Contributing to Assessment**: Alice Martinez, Dominic Fanelli, Lars Kjeseth, Ruth Zambrano, Juan Ortiz, Jose Villalobos,

**Action**: The results of this SLO will be shared with the Fall 2014 Math 37 instructors for feedback. We will determine as a group whether our instructional materials need revision. (12/11/2014)

**Action Category**: Teaching Strategies

**Follow-Up**: We have, over the past two years, rearranged and will continue to rearrange course material to better serve students. (09/20/2016)

**Follow-Up**: After discussing the results with the Fall 2014 Math 37 instructors, we determined that no new instructional materials were needed, but that we should organize the material we have so that students who are struggling with solving linear equations will have easier access to supplemental material offline. Work on this began in Spring 2015 and continues as one aspect of a larger reshaping of our course material that should be completed by Summer 2016. (09/09/2015)
<table>
<thead>
<tr>
<th>Course SLOs</th>
<th>Assessment Method Description</th>
<th>Results</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>demonstrate ability to solve equations. Please see attached related document</td>
<td>(Spring 2018) <strong>Standard Met?</strong>: Standard Not Met</td>
<td>instructors to teach math 37 for both parts of the course lecture and lab. It appears that having two instructors teaching the one class (one the lecture portion and the other the lab portion) is not as effective as having one instructor teach both portions. There is also a high drop rate from the course, especially those with two instructors. However, the pass rate from this course where students complete two levels of math in one semester still appears to outdo the pass rate for the math 12, 23, 40 pipeline. Due to AB705 we are seriously considering inactivating this course. If we do decide to keep the course we need to reconsider how the instructor assignments are done in order to improve the pass rate in the courses. (09/12/2018) <strong>% of Success for this SLO</strong>: 65.3</td>
<td></td>
</tr>
<tr>
<td>Level A: Simple Linear Equations</td>
<td>Data was turned in from 5 of the approximately 11 sections of math 37. There were 75 students total who attempted the SLO questions of which 49 had an average score of 2 or higher. Overall the average score was 2.06, however only 65.3% of the students scored a 2 or higher. It has been difficult to get instructors to teach math 37 for both parts of the course lecture and lab. It appears that having two instructors teaching the one class (one the lecture portion and the other the lab portion) is not as effective as having one instructor teach both portions. There is also a high drop rate from the course, especially those with two instructors. However, the pass rate from this course where students complete two levels of math in one semester still appears to outdo the pass rate for the math 12, 23, 40 pipeline. Due to AB705 we are seriously considering inactivating this course. Once decision are made with regard to AB 705 and if we do decide to keep the course we need to reconsider how the instructor assignments are done in order to improve the pass rate in the courses. (09/13/2019) <strong>Action Category</strong>: Program/College Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solve for x: -9=x+7</td>
<td><strong>Faculty Assessment Leader</strong>: Alice Martinez</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For each option below, explain why it is or is not an equation equivalent to 6-x=10.</td>
<td><strong>Faculty Contributing to Assessment</strong>: Alice Martinez</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-10=x</td>
<td>Related Documents:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6=10+x</td>
<td><strong>SLO grouped data math 37 spring 2018 slo 2.xlsx</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level B: General Linear Equations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solve for x and explain your process.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2x = 5(x - 4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solve for R.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A=(R-C)/x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level C: Quadratic Equations</td>
<td></td>
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</tr>
<tr>
<td>Solve for x and explain your process.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>?3x?^2-2x+1=1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solve for x.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x^2-2x+1=6</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Standard and Target for Success:</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The student work is graded on a scale of 0-3. The previous goal was for 2/3 to pass the course, which was met with a pass rate above 72%.</td>
<td></td>
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</tr>
<tr>
<td>Course SLOs</td>
<td>Assessment Method Description</td>
<td>Results</td>
<td>Actions</td>
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<tr>
<td></td>
<td>In the interest of improving our goal for student success should be that 70% of students pass the course to score 2 or better.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Related Documents:**
- Spring 2018 Math 37 SLO2 adjusted.docx
### Course SLOs

**SLO #2 Solving Equations and Manipulating Expressions** - Students will be able to use numerical and symbolic representations of mathematical ideas to simplify or solve linear, quadratic, rational, and radical expressions or equations.

**Course SLO Status:** Active  
**Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2017-18 (Spring 2018)  
**Input Date:** 11/20/2013

### Assessment Method Description

**Exam/Test/Quiz - Solving Quadratic Equations by Factoring**

- Please use a problem such as:
  - Solve for x:  
  
  \[3x^2 + 4x = 4\]

**Standard and Target for Success:**

- Grading: Please look for the following 3 key concepts when scoring:
  1. Sets equation equal to 0 before factoring
  2. Factors correctly
  3. Solves for x by setting each factor equal to 0

- Students receive 1 point for completing each of the above.

- Please focus on overall understanding of the concepts.

- 0 – blank or no relevant information

- 1 – completes One of the key concepts correctly

- 2 – completes Two of the key concepts correctly

- 3 – completes all Three of the key concepts correctly

- It is expected that 60% of Math 40 students will score 2 or 3 on this SLO.

**Related Documents:**  
[SLO Instructions & Rubric](#)

### Results

**Semester and Year Assessment Conducted:** 2013-14 (Spring 2014)  
**Standard Met?** : Standard Met  
812 students from 31 sections participated in this SLO assessment.  
125 or 15.4% of the students scored a 0.  
188 or 23.2% of the students scored a 1.  
194 or 23.9% of the students scored a 2.  
305 or 37.6% of the students scored a 3.

- The percentage scoring a 2 or 3 was 61.5%

- Factoring with a leading coefficient other than 1 is a difficult topic for many students. Students who have not yet mastered factoring are not successful with this SLO. This SLO includes the additional requirement of solving quadratic equations. Almost 40% of all our students have mastered both concepts, as seen by earning a 3 on this SLO. Over 60% have mastered 2 of the key concepts in this SLO.

- Solving quadratic equations is covered later in Math 40 using Completing the Square and/or Quadratic Formula. Also, Factoring and Solving Quadratic Equations are covered again in Math 73 or Math 80, so students will have more opportunities to completely master this topic before entering a transfer level math class.  

**Faculty Assessment Leader:** Anna Hockman


**Related Documents:**  
[M40 S14 Assessment Resultsx.pdf](#)

### Actions

**Action:** Provide instructors (via email) with factoring worksheets that emphasize the AC method using either factoring boxes or factoring by grouping, instead of guess and check factoring. (09/01/2015)

**Action Category:** Teaching Strategies

**Follow-Up:** All instructors teaching Math 40 in fall 2015 semester were sent the SLO report and were encouraged to try some of the action items included in the report. These instructors were also sent the worksheets which included the factoring worksheets. (09/04/2015)
### Course SLOs

<table>
<thead>
<tr>
<th>Assessment Method Description</th>
<th>Results</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>simplify each expression and solve each equation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) $7 + 2(x-2) = -11$</td>
<td>assessed</td>
<td>created to help students with identifying the difference between an equation and an expression. This worksheet will include practice problems that require students to distribute the negative sign. (09/05/2019)</td>
</tr>
<tr>
<td>a) This is an ______________ (expression or equation) because ____________________________</td>
<td>The above results indicated that 72.4% of the students scored a 2 or a 3 on this SLO therefore the standard for this SLO was met. Students were able to identify equation and expressions and explain how they knew. Many instructors expressed concern that students were having trouble distributing the negative sign in either simplifying the expression or in solving the equation. Some students also had challenges explaining how they knew they had an equation or expression.</td>
<td></td>
</tr>
<tr>
<td>b) If it is an expression, then simplify. If it is an equation, then solve.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) $3(2a-4) - 5(7-a)$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) This is an ______________ (expression or equation) because ____________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) If it is an expression, then simplify. If it is an equation, then solve.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) $(-4x^2 - 26x + 42x^3 - 12) - (-32x + 16x^3 - 19x^2 + 28)$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) This is an ______________ (expression or equation) because ____________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) If it is an expression, then simplify. If it is an equation, then solve.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Grading Rubric**

0 - Blank or no questions were answered correctly.

1 - Student identifies the equations and expression & can explain why.

---

**Faculty Assessment Leader:** Susanne Bucher

**Faculty Contributing to Assessment:** E Morales, J Ng, T Hoang, G. Scoot, M Tesfom, A Hockman, L Gui, S Bucher, B Dovner, M Bateman, J Gill, S Martinez, Z Dammema, H Nguyen, A Santana

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187 or 36.6% scored a 3
183 or 35.8% scored a 2
112 or 21.9% scored a 1
29 or 5.7% scored a 0

(09/05/2018)

**Action Category:** Teaching Strategies

**Follow-Up:** A worksheet was created and will be shared each semester with instructors who are teaching Math 40.

(03/12/2019)
<table>
<thead>
<tr>
<th>Course SLOs</th>
<th>Assessment Method Description</th>
<th>Results</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BUT no questions were answered correctly OR 1 Question is solved or simplified correctly. 1 Question is correctly identified.</td>
<td>2 - 2 Questions are solved or simplified correctly. 2 Questions are correctly identified and student explains how they know OR 3 Questions are solved or simplified correctly. BUT Questions are NOT correctly identified OR student cannot explain how they know.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 - ALL 3 questions are solved or simplified correctly. All 3 Questions are correctly identified and student explains how they know.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Standard and Target for Success:</strong> It is expected that 70% of the students will score a 2 or a 3 on this assessment.</td>
<td></td>
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</tr>
</tbody>
</table>
### SLO #2 Solving Equations and Manipulating Expressions

- **Students will be able to calculate perimeter, area, surface area and volume for various 2D and 3D geometric shapes.**

**Course SLO Status:** Active  
**Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2017-18 (Spring 2018)  
**Input Date:** 11/20/2013

<table>
<thead>
<tr>
<th>Assessment Method Description</th>
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</tr>
</thead>
</table>
| **Exam/Test/Quiz - Surface Area/Volume**  
You have a plan to construct a water tank. The tank will be a cylinder that is 30 feet long and 8 feet in diameter. How much sheet metal will you need to construct the water tank?  

a. Will you need to find surface area or volume to answer this question? Choose one.  
b. Draw a picture (not to scale) that includes correct placement of the measures given in this problem.  
c. Solve the problem.  

**Standard and Target for Success:** Rubric for SLO #2 Assessment:

Objective: Demonstrate ability to identify & correctly implement techniques to symbolically solve & manipulate expressions.

EXCELLENT: (3)  
- Correct choice of formula for solving problem  
- Clear evidence of the student's reasoning process  
- Correct picture with placement of measures  
- Techniques used to solve problem clearly indicate student has

**Semester and Year Assessment Conducted:** 2017-18 (Spring 2018)  
**Standard Met?** : Standard Met  
92 students (in 4 sections of Geometry) took part in completing this SLO.

- Attempted (Section 0310): 27  
  - Students that scored a 3: 11  
  - Students that scored a 2: 11  
  - Students that scored a 1: 3  
  - Students that scored a 0: 2

- Attempted (Section 0314): 24  
  - Students that scored a 3: 12  
  - Students that scored a 2: 6  
  - Students that scored a 1: 3  
  - Students that scored a 0: 3

- Attempted (Section 0316): 29  
  - Students that scored a 3: 13  
  - Students that scored a 2: 9  
  - Students that scored a 1: 3  
  - Students that scored a 0: 4

- Attempted (Section 0320): 12  
  - Students that scored a 3: 6  
  - Students that scored a 2: 3  
  - Students that scored a 1: 2  
  - Students that scored a 0: 1

- The overall results are listed below

**Exam/Test/Quiz - Surface Area/Volume**

You have a plan to construct a water tank. The tank will be a cylinder that is 30 feet long and 8 feet in diameter. How much sheet metal will you need to construct the water tank?

- a. Will you need to find surface area or volume to answer this question? Choose one.
- b. Draw a picture (not to scale) that includes correct placement of the measures given in this problem.
- c. Solve the problem.

**Objective:** Demonstrate ability to identify & correctly implement techniques to symbolically solve & manipulate expressions.

EXCELLENT: (3)  
- Correct choice of formula for solving problem  
- Clear evidence of the student’s reasoning process  
- Correct picture with placement of measures  
- Techniques used to solve problem clearly indicate student has

**Actions:** Among the teachers who teach Geometry, there will be an email discussion about possible ways to assist students in the understanding of surface area and volume. Students frequently confuse the two topics and if we can get a few key ways to assist students in their understanding, we may be able to improve our SLO results. (05/31/2019)

**Action Category:** Teaching Strategies

**Follow-Up:** There are fewer teachers teaching Geometry and as the lead teacher of the course, I continue to reach out to any new teachers of this course as a means to open discussion about teaching this subject. As a means to improve the understanding of these two topics, discussion among the teachers about ways to prevent the confusion would be helpful. (09/13/2019)
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<tbody>
<tr>
<td>an excellent understanding of concept.</td>
<td>Students that scored a 0: 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATISFACTORY: (2)</td>
<td></td>
<td>77% of the students passed the SLO (obtained a 3 or 4). Although the target was met, there is still room for improvement. Some students still confuse the fundamental concepts of surface area as opposed to volume. (05/30/2018)</td>
<td></td>
</tr>
<tr>
<td>• Correct choice of formula for solving problem</td>
<td></td>
<td>% of Success for this SLO: 77</td>
<td></td>
</tr>
<tr>
<td>• Some evidence of the student’s reasoning process</td>
<td></td>
<td>Faculty Assessment Leader: Susie Tummers Stocum</td>
<td></td>
</tr>
<tr>
<td>• Picture may contain an error in placement of measures</td>
<td></td>
<td>Faculty Contributing to Assessment: Lernik Saakian, Susie Tummers Stocum</td>
<td></td>
</tr>
<tr>
<td>• Techniques used to solve problem indicate student has a satisfactory understanding of concept.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEEDS IMPROVEMENT: (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Wrong choice of formula for solving problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Little evidence of the student’s reasoning process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Picture may have major errors in placement of measures or picture is incorrect 3D object</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Techniques used to solve problem clearly indicate student has deficiencies in understanding the concept.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNSATISFACTORY: (0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Student did not choose either formula.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• No evidence of the student’s reasoning process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• No picture is drawn.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Techniques used to solve problem clearly indicate student does not understand the concept.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TARGET: At least 75% of students in the class will obtain a score 2 or 3 on</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>(09/06/2014)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faculty Assessment Leader: Susie Tummers</td>
<td></td>
</tr>
</tbody>
</table>

Semester and Year Assessment Conducted: 2013-14 (Spring 2014)  
Standard Met?: Standard Not Met  
TOTAL OF ALL SECTIONS  
Math 60 Section 0310,0312,0314 Teachers: Tummers, Minasian  
SLO Pass & Pass Class: 43  
SLO Pass & Did Not Pass Class: 3  
SLO No Pass & Pass Class: 5  
SLO No Pass & Did Not Pass Class: 13  
Total Students who attempted SLO = 64  
Excellent = 34 of these students passed  
Satisfy = 12 of these students passed  
Needs Improvement = 11 of these students passed  
Unsatisfactory = 7 of these students passed  
71% of the students that attempted the SLO passed the SLO with a score of 3 or 4. Only 3 students that passed the SLO did not pass the class. Although we are close to the target, it has not yet been met.  
Action: Engage in an email conversation with teachers of Geometry to identify potential issues that students may have in understanding the question and brainstorm teaching techniques to assist teachers in helping students meet the target. (01/08/2018)  
Action Category: Teaching Strategies  
Follow-Up: Unfortunately, this semester (Spring 2015), we did not engage in an email conversation about the potential pitfalls that may come up with understanding this question. It is my hope to engage in this email conversation at the beginning of the Spring 2016 semester. (05/14/2015)
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<tbody>
<tr>
<td></td>
<td>the given problem.</td>
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</table>

**Faculty Contributing to Assessment:** Susie Tummers, Ashod Minasian
## Course SLOs

<table>
<thead>
<tr>
<th>SLO #2 Solving Equations and Manipulating Expressions</th>
<th>Exam/Test/Quiz - The SLO assessment is a quiz including several problems. Problem 4 was used to assess SLO #2. See attached.</th>
<th>Semester and Year Assessment Conducted: 2017-18 (Spring 2018)</th>
</tr>
</thead>
</table>
| Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems using authentic, real-world data. | **Standard and Target for Success:** It is expected that 70% of students will score 2 or better. The scale is 3-correct (excellent), 2-mostly correct (satisfactory), 1-some correct (less than satisfactory), 0-nothing correct. **Related Documents:** [Quiz11_SLO_SP14.pdf](Quiz11_SLO_SP14.pdf) | **Standard Met?** : Standard Met  
There were 181 students in 5 sections (0350, 0352, 0356, 0360,0362) of Math 67 who took the SLO quiz in spring 2018. 30 scored 0, 23 scored 1, 53 scored 2 and 75 scored 3. So 128/181, or 71% passed, which meets expectations. Of those who passed the course, about 75% passed the SLO, which indicates that understanding how to algebraically solve a variety of equations (SLO#2) is a necessary skill for passing the course. Additionally, about 78% (of those passed the SLO did not pass the course, which indicates that the skill in SLO #2 is not by itself sufficient to pass the course. |
| **Course SLO Status:** Active | **Faculty Assessment Leader:** Lars J Kjeseth  
**Faculty Contributing to Assessment:** Lars J Kjeseth | **Action:** Our focus in the next twelve months, should the course survive in the AB 705 world, will be to investigate how students develop schema for handling symbolic critical thinking. We will explore the literature for related threshold concepts. (09/30/2019) **Action Category:** Teaching Strategies |
| **Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2017-18 (Spring 2018) | **% of Success for this SLO:** 71  
**Semester and Year Assessment Conducted:** 2013-14 (Spring 2014)  
**Standard Met?** : Standard Met  
There were 90 students in four sections (0330, 0336, 0344, 0332) of Math 67 who took the SLO quiz in spring 2014. Six scored 0, 20 scored 1, 14 scored 2 and 49 scored 3. So 63/89, or 71% passed, which meets expectations. Of those who passed the course, about 84% passed the SLO, which indicates that understanding how to algebraically solve a variety of equations (SLO#2) is a necessary skill for passing the course. Additionally, about 59% (of those passed the SLO did not pass the course, which indicates that the skill in SLO #2 is not by itself sufficient to pass the course. | **Action:** Our goal to to increase the percentage of those passing the course who pass the SLO. We will make better use of student test corrections and student reflections on their exams as to what was correct and why and what mistakes were made and why. We will ask the instructors to report what changes were made. (09/05/2015) **Action Category:** Teaching Strategies  
**Follow-Up:** With our revision of Math 67 (soon to be approved - knock on wood), we have begun again our process of designing a new comprehensive SLO quiz for Math 67. Ongoing. (09/23/2016) |
| **Input Date:** 11/20/2013 | **Faculty Assessment Leader:** Susan Taylor  
**Faculty Contributing to Assessment:** Patricia Stoddard, Sue Bickford, Susan Taylor | **Exam/Test/Quiz** - The SLO assessment is a quiz including several problems. Problem 4 was used to assess SLO #2. See attached.  
**Related Documents:** [Quiz11_SLO_SP14.pdf](Quiz11_SLO_SP14.pdf)  
**Semester and Year Assessment Conducted:** 2017-18 (Spring 2018)  
**Standard Met?** : Standard Met  
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**Faculty Contributing to Assessment:** Lars J Kjeseth  
**% of Success for this SLO:** 71  
**Semester and Year Assessment Conducted:** 2013-14 (Spring 2014)  
**Standard Met?** : Standard Met  
There were 90 students in four sections (0330, 0336, 0344, 0332) of Math 67 who took the SLO quiz in spring 2014. Six scored 0, 20 scored 1, 14 scored 2 and 49 scored 3. So 63/89, or 71% passed, which meets expectations. Of those who passed the course, about 84% passed the SLO, which indicates that understanding how to algebraically solve a variety of equations (SLO#2) is a necessary skill for passing the course. Additionally, about 59% (of those passed the SLO did not pass the course, which indicates that the skill in SLO #2 is not by itself sufficient to pass the course. | **Action:** Our goal to to increase the percentage of those passing the course who pass the SLO. We will make better use of student test corrections and student reflections on their exams as to what was correct and why and what mistakes were made and why. We will ask the instructors to report what changes were made. (09/05/2015) **Action Category:** Teaching Strategies  
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**Faculty Contributing to Assessment:** Lars J Kjeseth  
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**Follow-Up:** In order to have our SLO data be more consistent between semesters we developed a quiz in which all of our course SLOs are covered. Single questions on the quiz may be used to assess more than one SLO. We have a practice quiz which is very targeted for these skills and emphasized their importance to the students. Though we haven't reassessed SLO #2 the results of the SLO quiz in spring 2015 seem to indicate that the placement of more instructor emphasis on the skills as resulted in an uptick in student success in these areas assessed by the SLO quiz which would include SLO #2. (09/11/2015)
**Course SLOs**

<table>
<thead>
<tr>
<th>SLO #</th>
<th>Description</th>
<th>Input Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO #2</td>
<td>Solving Equations and Manipulating Expressions</td>
<td>11/20/2013</td>
</tr>
</tbody>
</table>

**Assessment Method**

- Exam/Test/Quiz - Math 73 SLO Assessment Spring 2014

**Description**

- SLO #2 Solving Equations and Manipulating Expressions
  - Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems.
  - Course SLO Status: Active
  - Course SLO Assessment Cycle: 2013-14 (Spring 2014), 2017-18 (Spring 2018)

**Results**

- Semester and Year Assessment Conducted: 2012-13 (Spring 2013)
  - Standard Met? : Standard Met
  - 865 Students took this SLO assessment. 105 (12%) students got a score of 0, 158 (18%) students got a score of 1, 173 (20%) students received a 2, and 429 (50%) students received a 3 as their score. This means that 69.595% of students received a score of 2 or 3.

  - We see that 70% of our students received a satisfactory score. The other 30% may have had problems with finding the LCD, factoring, or checking their answer. We should stress the reason why the LCD is found, and emphasize the difference between fraction addition and solving rational equation. For those students not checking their answer we should re-enforce the idea of domain.

  - Suggestions: 1) Activities and guided notes for students. 2) Sharing office hours with other instructors have been successful in the past. 3) Gateways for all Math73 courses offered would help students learn the basics of Math73.

**Actions**

- Action: Raise the Target for Success to 70% (09/08/2014)

  - Follow-Up: This action is still in progress. Committee D can address the consideration of shared office hours and student preparation through gateway courses. For example, addressing why the LCD is found for solving rational equations. (09/19/2016)
<table>
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<tr>
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<th><strong>Description</strong></th>
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</tr>
</thead>
</table>
| **SLO #2 Solving Equations and Manipulating Expressions** | Students will be able to symbolically (algebraically) solve a variety of equations, inequalities and linear systems and manipulate symbolic (algebraic) expressions that arise in contextualized problems. Instructors were asked to assess their students using either one of two questions provided below, or to select their own question. (Option 1) | | needs to multiply by the LCD correctly | 2 – Most understanding  
Correctly clears the fraction  
3 – Complete understanding  
Gets the correct answer (x = 6) |

**Standard and Target for Success:** It is expected that 65% of students will score a 2 or 3 (Satisfactory or Excellent) on this SLO.

**Related Documents:**  
Math 73 SLO SPRING 2014 SLO#2.docx

**Exam/Test/Quiz - SLO #2**  
- Solving Equations and Manipulating Expressions

**Semester and Year Assessment Conducted:** 2017-18 (Spring 2018)

**Standard Met?** : Standard Met

**Data:** The Rubric for this assessment is on a scale of 0 to 3; where the score directly correlated to the number of correct answers each student provided. The following data was gathered with the participation of 10 out of 12 instructors (85.71%), including 14 out of 16 sections (88.89%). With a total of 362 students; 46 out of the 362 (12.71%) students were not able to accurately answer any of the questions and earned a ‘0’, 73 out of the 362 (20.17%) students were able to accurately answer only 1 question and earned a ‘1’, 104 out of the 362 (28.73%) students were able to accurately answer 2 out of the 3

**Action:** The results of the slo will be provided to the committee D faculty for feedback/comments (09/30/2019)  
**Action Category:** SLO/PLO Assessment Process
### Course SLOs

#### Assessment Method Description

When priced at $25 each, a toy has annual sales of 5,500 units. The manufacturer is considering raising the price of the toy to price point 'x'. Using the results of a market survey, the manufacturer estimates that each $1 increase in price will decrease sales by 125 units.

A) Find an equation \( S(x) \) that models the annual sales as a function of 'x', the price of the toy.

(Show your work) \( S(x) = 5500 - 125x \)

B) Find an equation \( R(x) \) that models the annual revenue as a function of 'x', the price of the toy.

(Show your work) \( R(x) = (25 - x)(5500 - 125x) \)

(Show your work) Revenue = (price) * (units sold)

C) If the manufacturer raises the price to $32.50, what is the expected revenue?

(Round to the nearest penny)

(D) Find the unit price that will maximize the total revenue. (Round to the nearest penny)

(Show your work) (Option 2)

The observed bunny rabbit population, 'p', at a park is given by the function \( p = -.3t^2 + 120t + 1200 \), where 't' is the time in months since they began observing the rabbits.

(a) How many rabbits were on the island when they started observing them? (Show your work)

(b) When is the maximum population attained? (Show your work)

---

#### Results

When priced at $25 each, a toy has annual sales of 5,500 units. The manufacturer is considering raising the price of the toy to price point 'x'. Using the results of a market survey, the manufacturer estimates that each $1 increase in price will decrease sales by 125 units.

A) Find an equation \( S(x) \) that models the annual sales as a function of 'x', the price of the toy.

B) Find an equation \( R(x) \) that models the annual revenue as a function of 'x', the price of the toy.

(Show your work) \( S(x) = 5500 - 125x \)

(Show your work) Revenue = (price) * (units sold)

C) If the manufacturer raises the price to $32.50, what is the expected revenue?

(Round to the nearest penny)

D) Find the unit price that will maximize the total revenue. (Round to the nearest penny)

(Show your work) (Option 2)

The observed bunny rabbit population, 'p', at a park is given by the function \( p = -.3t^2 + 120t + 1200 \), where 't' is the time in months since they began observing the rabbits.

(a) How many rabbits were on the island when they started observing them? (Show your work)

(b) When is the maximum population attained? (Show your work)

---

### Faculty Assessment Leader:
Le Giu, Eduardo Barajas

### Faculty Contributing to Assessment:
Formanes, Manolita; Eldanaf, Diaa; Martinez Alice; Kasabian Judy; Granich Megan; Seyedin Aban; Broderick, Carl; Sheynshteyn Arkadiy; Numrich, Kristine; Tadele, Gizaw

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### Summary:
Our results indicates that 243 of the 362 (67.13%) students either earned a perfect score or missed only 1 question; this result is above our target of 65%.

(09/13/2018)

**% of Success for this SLO:** 67.13

**Faculty Assessment Leader:** Le Giu, Eduardo Barajas

**Faculty Contributing to Assessment:** Formanes, Manolita; Eldanaf, Diaa; Martinez Alice; Kasabian Judy; Granich Megan; Seyedin Aban; Broderick, Carl; Sheynshteyn Arkadiy; Numrich, Kristine; Tadele, Gizaw
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**Standard and Target for Success:** It is expected that 65% of students will score a 2 or 3 (Satisfactory or Excellent) on this SLO.
## Course SLOs

### SLO #2 Solving Equations and Manipulating Expressions
- Students will be able to evaluate numerical operations and manipulate algebraic expressions involving rational and negative exponents, radicals, complex numbers, exponents and logarithms and be able to solve linear, quadratic, polynomial, rational, radical, absolute value, exponential and logarithmic equations and inequalities.

**Course SLO Status:** Active

**Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2017-18 (Spring 2018)

**Input Date:** 11/20/2013

### Exam/Test/Quiz
- There were two questions selected this semester; Instructors had the freedom to select either one. The first question involved the exponential growth of Chipotle restaurants. Students were told that there were 75 Chipotle restaurants in 1993, 675 in 1995, and that the number of Chipotle restaurants grow exponentially. Students were given the general exponential growth function and for part a) of the question they were asked to find an exponential function on t number of years since 1990. For part b) students were asked to evaluate f(4) using their results from part a) and to interpret their results in a sentence format. Finally for part c) of the question students were asked to use their results from part a) to predict when the number of Chipotle restaurants will reach 10,000. The question given follows:

The number of Chipotle restaurants has grown exponentially. In 1993 there were 75 Chipotle restaurants and in 1995 there were 675. Let \( f(t) = a \cdot b^t \) be the number of Chipotle restaurants at \( t \) years since 1990.

a) Find an equation of \( f(t) \).
b) Evaluate \( f(4) \). What does it mean in this situation?
c) Predict in which year Chipotle reached 10,000 restaurants.

### Semester and Year Assessment Conducted: 2013-14 (Spring 2014)

**Standard Met?** : Standard Not Met

**Data:** The Rubric for this assessment is on a scale of 0 to 3; where the score directly correlated to the number of correct answers each student provided. The following data was gathered with the participation of 19 out of 29 instructors (65.52%), including 21 out of 31 sections(67.74%). With a total of 494 students; 165 out of the 494 (33.4%) students were not able to accurately answer any of the questions and earned a ‘0’, 109 out of the 494 (22.06%) students were able to accurately answer only 1 question and earned a ‘1’, 106 out of the 494 (21.46%) students were able to accurately answer 2 out of the 3 questions and earned a ‘2’, and finally 114 out of the 494 (23.08%) students were able to accurately answer all 3 questions and earned a ‘3’. Additionally, some instructors volunteered students’ final course grade information and the following data was compiled: 121 out 324 students (37.35%) passed the SLO question with a score of ‘2’ or ‘3’ and also passed the course with a grade of ‘A’, ‘B’, or ‘C’, 17 out 324 students (5.25%) passed the SLO question with a score of ‘2’ or ‘3’ but failed to successfully pass the course by earning a ‘D’, ‘F’, ‘I’, or ‘W’, 77 out 324 students (23.77%) failed the SLO question with a score of ‘0’ or ‘1’ and also failed to successfully pass the course by earning a ‘D’, ‘F’, ‘I’, or ‘W’, and finally 109 out 324 students (33.64%) failed the SLO question with a score of ‘0’ or ‘1’ and also failed to successfully pass the course by earning a ‘D’, ‘F’, ‘I’, or ‘W’.

**Instructor comments:** One instructor responded: “I believe the results I observed were fairly strong for this SLO question. With 19/32 or 59% of students at complete or most understanding, I felt that despite there is room for improvement, I think a majority of Math 80 students to solve the problem mostly correct shows a fairly robust grasp of the concept and the algebra behind it.”

**Action:** The results of this assessment will be shared and discussed at the next committee D meeting, and then again at the next Math department meeting. The fruits of those conversations will be used to create and shape a plan of action to improve our students’ performance on future SLO assessments. (12/31/2014)

**Action Category:** SLO/PLO Assessment Process
<table>
<thead>
<tr>
<th>Course SLOs</th>
<th>Assessment Method Description</th>
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<td></td>
<td>The second question involved the exponential growth of rodents in Los Angeles. Students were first given the general equation to model population growth. Then students were told that in 2014 the rodent population in Los Angeles was estimated to be 50,000; with an expectation that it will double every 4 years. For part a) of the question students were asked to find the value of the constant ‘K’ in the population growth formula. Then for part b) students were asked to use their results from part a) to predict when the rodent population was expected to reach 10 million. And finally, for part c) of the question students were asked to use their results from part a) to predict the rodent population in the year 2024. The question given follows:</td>
<td>Summary: Our results indicates that 220 of the 494 (44.53%) students either earned a perfect score or missed only 1 question; this result is below our target of 60% . As an important point of interest, some instructors expressed concern that the Tussy book did not have word problems that adequately prepared students to answer these Assessment questions. (09/10/2014)</td>
<td>Faculty Assessment Leader: Eduardo Barajas Faculty Contributing to Assessment: Eduardo Barajas, Tavakkoli, Aban Seyedin, Zachary Marks, Trudy Meyer, Formanes, Avid Khorram, Juan Martinez, Bob Lewis, Michael Bateman, Linda Ho, Robert Horvath, Greg Scott, A Hoang, Carl Broderick, Avid Khorram, Len Wapner, M George, H Hamza</td>
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<td></td>
<td>If ‘P’ is the population at some time ‘t’, Po is the initial population at t = 0, and k depends on the rate of growth then, P = P0 e^kt</td>
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<td>The rodent population in Los Angeles is currently (2014) estimated at 50,000. If it is expected to double every 4 years; a) Find the value of ‘K’ in the equation P = P0 e^kt b) In what year will the rodent population in Los Angeles reach 10 million? c) what will be the rodent population in the year 2024?</td>
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<td>Both questions involved exponential equations. Both questions contained three very similar subparts. Therefore, the rubric for both questions was the same. The Rubric for this assessment was on a scale of 0 to 3; where the score directly correlated to the number correct answers each student provided. If students correctly answered all 3 subparts they would earn a score of ‘3’, If students correctly answered 2 out of 3 subparts they would earn a score of 2, If students correctly answered 1 out of 3 subparts they would earn a score of 1, If students failed to answer any of the subparts correctly they would earn a score of 0, Use the following rubric: 0 –No understanding = Student answered none of the parts a)-c) correctly 1 –Some understanding = Student answered 1 of the parts a)-c) correctly 2 –Much understanding = Student answered 2 of the parts a)-c) correctly 3- Complete understanding = Student answered all of the parts a)-c) correctly</td>
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</table>

**Standard and Target for Success:**
The target for this Assessment is to have more than 60% of our students reach either c "much understanding' or "complete understanding"; that is, for more that 60% of our students to earn a score of '2' or '3' |

**Exam/Test/Quiz -** Semester and Year Assessment Conducted: 2017-18  
**Action:** We will present the data
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>The number of Chipotle restaurants has grown exponentially. In 1993 there were 75 Chipotle restaurants and in 1995 there were 675. Let f(t)=a·b^t be the number of Chipotle restaurants at 't' years since 1990. a) Find an equation of f(t). b) Evaluate f(4). What does it mean in this situation? c) Predict in which year Chipotle reached 10,000 restaurants. Do not guess, justify your answer with work and either express your answer as an exact expression involving logarithms or a decimal rounded to the thousands place.</td>
<td>(Spring 2018) <strong>Standard Met?</strong>: Standard Not Met There were 498 students participate this assessment, 92 students (18.5%) earned &quot;0&quot;, 131 students (26.3%) earned &quot;1&quot;, 136 students (27.3%) earned &quot;2&quot;, 139 students (27.9%) earned &quot;3&quot;. Totally there were 275 students (55.2%) earned &quot;2&quot; and &quot;3&quot;. Therefore the standard was not met.</td>
<td>to the committee D members to collect their feedback. (09/13/2019) <strong>Action Category</strong>: SLO/PLO Assessment Process</td>
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<td>Option 2</td>
<td>If ‘P’ is the population at some time ‘t’, Po is the initial population at t = 0, and k depends on the rate of growth then, P = P0 e^kt The rodent population in Los Angeles is currently (2018) estimated at 50,000. If it is expected to double every 4 years; a) Find the value of ‘k’ in the equation P = P0 e^kt b) In what year will the rodent population in Los Angeles first reach</td>
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<td>10 million?</td>
<td>c) what will be the rodent population in the year 2034? (round to the nearest rodent)</td>
<td>0 –No understanding  Student answered none of the parts a)-c) correctly  1 –Some understanding  Student answered one of the parts a)-c) correctly  2 –Much understanding  Student answered two of the parts a)-c) correctly  3– Complete understanding  Student answered all of the parts a)-c) correctly</td>
<td></td>
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</table>

**Standard and Target for Success:**

60% of students are expected to achieve the score 2 or 3 on the assessment.