Creating Effective MyMathLab Problems Aligned with 7th Grade Pre-Algebra Common Core State Standards

Erin Ashley Glover

Louisiana State University and Agricultural and Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_theses

Part of the Physical Sciences and Mathematics Commons

Recommended Citation
https://digitalcommons.lsu.edu/gradschool_theses/307

This Thesis is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Master's Theses by an authorized graduate school editor of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.
CREATING EFFECTIVE MYMATHLAB PROBLEMS ALIGNED WITH 7TH GRADE PRE-ALGEBRA COMMON CORE STATE STANDARDS

A Thesis
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Natural Sciences

in

The Interdisciplinary Program in Natural Sciences

by
Erin A. Glover
B.S., Louisiana State University, 2006
M.S., Louisiana State University, 2009
August 2014
ACKNOWLEDGEMENTS

I am grateful and appreciative to my principal, Phyllis Crawford, and my colleagues, Darlene Ford, Kimberly Daniels, and Cherie Neill, at Sherwood Middle Academic Magnet School. As a “newer” teacher striving to improve my teaching skills, their continued support and guidance has had a great influence on my development and success as a middle-school math teacher. I would especially like to thank Darlene Ford for her excellent example as a dedicated teacher, as well as inspiring me to be a part of the Louisiana Math and Science Teacher Institute at Louisiana State University. My thesis advisor, Dr. Neubrander, has been a true guidance counselor, and I greatly appreciate his ongoing help. He is dedicated to helping his students succeed and to furthering the field of mathematics and math education. Support was received from NSF grant number 0928847.
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS ........................................................................................................ ii
LIST OF TABLES ................................................................................................................... iv
LIST OF FIGURES ................................................................................................................ v
ABSTRACT ............................................................................................................................. vi
INTRODUCTION ................................................................................................................ 1
MYMATHLAB ...................................................................................................................... 11
COMMON CORE STATE STANDARDS IN THE ENGAGENY CURRICULUM ............ 25
THE CCSS ALIGNMENT OF MML .................................................................................. 29
FURTHER DEVELOPMENT ............................................................................................... 37
REFERENCES ....................................................................................................................... 41
APPENDIX ........................................................................................................................... 43
VITA ..................................................................................................................................... 226
LIST OF TABLES

TABLE 1: Advantages and Disadvantages of Each Version................................................................. 4

TABLE 2: CCSS in 7th Grade EngageNY Modules 1 and 2 ................................................................. 30
LIST OF FIGURES

FIGURE 1: Student Emails through “Ask My Instructor” ................................................................. 8
FIGURE 2: MyMathLab Helpful Features .......................................................................................... 12
FIGURE 3: “Help Me Solve This” ..................................................................................................... 13
FIGURE 4: “Help Me Solve This” continued ..................................................................................... 13
FIGURE 5: “View an Example” ......................................................................................................... 14
FIGURE 6: “View an Example” continued ......................................................................................... 14
FIGURE 7: “Video” ........................................................................................................................... 15
FIGURE 8: Assignment Settings ......................................................................................................... 15
FIGURE 9: Incorrect Answer Feedback ............................................................................................. 16
FIGURE 10: “Similar Exercise” button ............................................................................................. 17
FIGURE 11: “Similar Exercise” .......................................................................................................... 17
FIGURE 12: Eureka Math Student Edition Workbooks ................................................................. 25
FIGURE 13: Eureka Math Teacher Edition Modules ......................................................................... 25
FIGURE 14: “Course Tools” and “Assignment Manager” ............................................................. 34
FIGURE 15: “Create Assignment” and “Create Custom Question” ............................................... 34
FIGURE 16: 7th grade EngageNY Custom Question List and “Create New Question” .............. 35
FIGURE 17: Creating assignments using the 7th grade EngageNY materials from Appendix A 36
FIGURE 18: Creating assignments using the 7th grade EngageNY materials from Appendix A 36
FIGURE 19: ALEKS Assessment Report .......................................................................................... 39
ABSTRACT

As states across the nation began to transition to the Common Core State Standards (CCSS), new curriculums and supplemental resources were and are still being developed to guide and support the teachers and students. Pearson Education, the publisher of many mathematics textbooks, as well as the online program MyMathLab (MML), has been successfully providing meaningful, lasting mathematics learning materials for many years. Online learning programs, including MML, are used in thousands of middle school, high school, and college-level mathematics courses. However, these products were developed long before the adoption of the CCSS by 43 states, so they are not aligned with the rigorous vertical structure, level of fluency, and conceptual understanding required by the CCSS and by the new national testing consortia Partnership for Assessment of Readiness for College and Careers (PARCC) and Smarter Balance.

The purpose of this master thesis is to show that it is entirely within reach to fully utilize/align the MML platform with CCSS-based curricula like the EngageNY (Eureka Math) curriculum. As a “proof of concept,” the materials in Appendix A demonstrate how one can utilize MML to deliver lesson components, homework, mid-module assessments, and end-of-module assessments from the EngageNY mathematics curriculum. Using Modules 1 and 2 from the 7th grade EngageNY pre-algebra course, the created materials shown in Appendix A include examples, exercises, and problem sets from two lessons, as well as three different versions of all Module 1 and 2 exit tickets and assessments, and a Module 3 sprint. The MML platform documented in Appendix A is by no means a final product. Its sole purpose is to show that an MML platform to accompany the EngageNY mathematics curriculum can be developed effectively in a reasonable amount of time and with limited resources. Clearly, aside from legal
issues that would have to be addressed, some editing and polishing would need to be done before piloting the MML platform in a real classroom, but the foundation is set with the work done in this thesis.
INTRODUCTION

Through teaching five years of middle school math, I have learned that teaching is a constant self-reflection process. In an effort to improve student learning and enhance my efficiency as a teacher, I am constantly analyzing my practices and teaching techniques. By evaluating tools and observing other teachers’ methods, my effectiveness as a teacher has evolved by implementing different approaches to achieve learning-objectives and increase student achievement. Providing the richest possible learning experiences I can for my students is my ultimate goal. Helping students find success with understanding, practicing, and applying mathematics is a rewarding challenge. Some students have difficulty grasping certain concepts, so different approaches to teaching must be implemented in order to help all students succeed. Students will gain knowledge and understanding when they put forth effort to learn. Therefore, it is the teacher’s job to sufficiently motivate the students to expend the effort to learn by providing dynamic lessons and assignments in an engaging environment with the resources available (Epstein, 2001, p. 185).

As the world’s leading learning company and the leading pre K-12 curriculum, testing, and software company in the U.S., Pearson (2014) collaborates with colleges, universities, organizations, and educators to build educational products that help students learn. Pearson’s MyMathLab (MML) is one of the resources teachers, like myself, use because of the quality of mathematics practice, along with the many learning aids provided within the program to promote student learning. The homework aids such as “Help Me Solve This” or “View an Example” promote student engagement and therefore, learning. In MML, there is a plethora of math problems available to choose from. Since numeric values regenerate, there is a seemingly unlimited amount of practice students can take advantage of as they become comfortable and
fluent with the concept. With the data an MML course instructor receives from the program, he or she is able to gain knowledge about specific strengths and weaknesses of the students as a whole class or individually. This allows the instructor to better understand the different needs of each class or each student and, therefore, be able to address these needs.

My goal is to expand the effectiveness of MML by providing valuable assignments and assessments to accompany the EngageNY (Eureka Math) curriculum that will be beneficial to both the teachers and the students. Louisiana, along with 42 other states, has adopted the Common Core State Standards (CCSS) which has given rise to a need to change some of our educational materials and teaching styles. Out of this need, the EngageNY curriculum has emerged. The EngageNY curriculum outlines how CCSS-based instruction could be delivered, which is valuable since the CCSS is new and many teachers are unsure of how to implement these standards successfully. This curriculum is not only for students. It is for teachers also, so that through the process of teaching students, the teachers will learn to be more reflective about the balance of rigor, asking open-ended conceptual questions, and scaffolding the instructional sequence (C. Anderson, personal communication, June 26, 2014).

The Common Core State Standards were released June 2, 2010, and were fully implemented in Louisiana for the 2013-2014 school year. The standards called for three specific shifts in math education. These include having a greater focus on fewer topics at each grade level, emphasizing coherence within and across the grades, and providing a balance of rigor. On the Core Standards (2014) website, rigor is explained as “conceptual understanding, procedural skills and fluency, and application with equal intensity.” The EngageNY curriculum reaches a level of rigor unlike any other curricula I have encountered. Students must understand how things work mathematically and why they work that way to make real-life applications. This can
be observed by examining the type of problems presented to the students, how the students work through them, and the vocabulary that is used within the lessons. Students will benefit from exposure to and practice with the tasks from EngageNY. Since I use the 7th grade CCSS math curriculum from EngageNY, and it has proven to be valuable, I will use this curriculum to implement tasks within MML.

This thesis is based on meeting the needs of my students and fully preparing them for the next level of mathematics. All students at Sherwood Middle Academic Magnet School, East Baton Rouge Parish, Louisiana, and throughout the United States could use the materials that were created and are featured in Appendix A. The materials include CCSS-aligned MML tasks that are based on the 7th grade EngageNY math curriculum Modules 1 and 2, and a sprint from Module 3. These materials are a “proof of concept” and would need to be completed before teachers could implement them in their classes. In order for my students to be successful at the rigorous level required by the CCSS, they need rigorous homework practice that is connected to what they do in class. Teachers that are striving to meet the rigor of the CCSS and that use MML can use these problems. Students typically get only one copy when it is on paper. Why not give students multiple chances to practice a problem and get it right, while providing further instruction and assistance to enhance the level of learning? Using MML as the platform for these tasks will meet these needs, and since MML is digital and online, it is also geared towards the direction 21st century educational settings are heading.

The EngageNY curriculum has tasks that are strategically formed to challenge and assess the knowledge of students. Some of the Module 1 and 2 tasks that were programmed into MML were copied verbatim from the EngageNY curriculum. One version that was copied requires a written explanation to be turned in. The advantage of using this version is that the task can be
assigned along with other MML homework, quiz, or test tasks within the program without having to make additional announcements about separate assignments. Teachers may want to use this version for certain types of tasks, such as tasks that involve drawing, graphing, or creating tables. As math educators, we don’t want to get away from using paper altogether either. The “View an Example” or “Video” features could be programmed to use in homework assignments for this version. The disadvantage to this version is that the tasks have to be manually graded, although we are able to learn about our students thought processes and misconceptions from

| TABLE 1: Advantages and Disadvantages of Each Version |
|-----------------------------------------------|-------------------------------------------------|
| **Copied Version with Written Explanation**   | **Advantages**                                  | **Disadvantages**                              |
|                                               | • Can be assigned within MML program, so no additional announcements about separate homework are needed | • Uses paper                                   |
|                                               | • Use for certain tasks i.e. drawing, graphing, making a table | • Must be graded manually                       |
|                                               | • Don’t want to get away from using paper altogether | • No immediate feedback or instructional features |
|                                               | • Capability to program instructional features for homework assignments |                                                  |
| **Copied Version with Essay Input**           | **Advantages**                                  | **Disadvantages**                              |
|                                               | • Work will be digitalized                       | • Can only be assigned through quiz or test     |
|                                               | • Convenient                                    | • Cannot be with any other digital input answers|
|                                               | • Good PARCC prep with written explanations      | • Must be graded manually                       |
|                                               | • Will give teacher the length of time a student spent completing | • No immediate feedback or instructional features|
|                                               | • Capability to program instructional features for homework assignments |                                                  |
| **Similar Version with Regenerative Values and Digital Input** | **Advantages**                                  | **Disadvantages**                              |
|                                               | • Work will be digitalized                       | • Cannot be an essay task                       |
|                                               | • Convenient                                    | •                                              |
|                                               | • Good PARCC prep with guided experience to complete tasks | •                                              |
|                                               | • Will give teacher the length of time a student spent completing, which parts the student missed, and how many times the student attempted the task | •                                              |
|                                               | • Regenerative numeric values                    | •                                              |
|                                               | • Capability to program immediate feedback and instructional features for homework assignments | •                                              |
grading their written work. The advantages and disadvantages of each of the three versions are listed in Table 1.

A second version includes copied tasks that allow students to digitally input essay answers by using the MML palette tools. The advantages of this version are that their work will be digitalized, allowing students to return and review the material. It will also create an online math portfolio of work. Using digital input is convenient since no extra supplies are necessary. Constructing digitally written explanations is good practice in preparation for PARCC as well. The data provided from using this version will include the length of time the student spent completing the task. The “View an Example” or “Video” features could also be programmed to use in homework assignments for this version. The disadvantages of using this second version are that MML essay tasks can only be assigned through quizzes or tests, they cannot be paired with multiple choice or numeric input within the same question, and they have to be manually graded. Since they are completed online, in order to give specific feedback, the teacher would have to give each student feedback through a different means of communication, such as paper or email. This also means that no automatic feedback is provided to the student after completing the task.

A third version consists of tasks that are programmed to regenerate different values algorithmically and allow the student to answer digitally by multiple choice, essay, or short answer. The tasks in the third version are similar compared to the other two versions, but these tasks remain fully aligned with corresponding tasks in the EngageNY modules. The advantages to the third version include that it can be automatically graded by the program, it will be digitalized, it is convenient, and it provides a more guided experience. The numeric values in this version are regenerative, so students can complete the task multiple times using different values.
Through this version, the teacher is provided data about the length of time a student spends within the task, which parts a student missed, and the number of times a student attempts the task. The capability to program question specific feedback and all instructional features, including “Help Me Solve This,” is available for these tasks. These features are only available when the task is assigned as homework. The disadvantage to this version is that the questions cannot be assigned as an essay. Because of this, you may not gain as much knowledge about student thought processes and misconceptions when using this version.

The majority of the content in this thesis will be the materials created, which are included in Appendix A. It is a matter of teacher preference to choose which version to use and how to use it, and this may vary based on the nature of the task. However, if a version is used that requires digital input, there is potential to decrease costs for student materials. Instead of providing students with printed workbooks or reproducing copies of the lessons, teachers can use the digital MML version, which reduces expenses. However, if schools or districts do purchase printed materials or make copies of materials, the MML tasks will complement these materials.

During the summer of 2012, I attended the College Readiness Program (CRP) at Louisiana State University to receive training with MML. The CRP began in 2006 with the goal of helping high school students earn college credit through a program called Dual Enrollment (Rouse, 2013, slide 7). The Dual Enrollment program is a blended-learning course in which the students receive classroom instruction in their high school math class for a third of the time. They are also required to complete an online MML component through LSU for two-thirds of the time. To facilitate this type of high school math class through LSU, the teacher must be trained through the CRP. In the 2013-2014 school year, twenty high schools in Louisiana offered Dual Enrollment courses (College Readiness, 2010). Since MML has been effectively
implemented in LSU courses, including the four Dual Enrollment courses offered, and MML courses have expanded to include high school Algebra I, Geometry, Algebra II, Advanced Math, Business Calculus, Calculus, and grades 6-8 mathematics, the CRP program is now training teachers of all these courses (Rouse, 2013, slide 9). Among the CRP trainers were LSU Instructor and Director of the program, Phoebe Rouse, and two of my teacher co-workers from Sherwood Middle, Darlene Ford and Kimberly Daniels. These two teachers, as well as another Sherwood Middle teacher not present at the training, Cherie Neill, had already been using MML in their math classes. So, when I began to use MML during the 2012-2013 school year, I had ample support and assistance from fellow teachers, as well as pre-made courses provided by the LSU CRP. After being trained through the LSU CRP, participants are given access to middle and high school MML math courses that are already aligned to each grade-level mathematics course (Rouse, 2013, slide 9). These pre-made courses have topic assignments, such as “Equivalent Ratios and Rates,” ready to be assigned to students, and which can also be edited and customized prior to assigning. Through creating, editing, and customizing assignments for my students, I became comfortable with the MML program. I have enjoyed using MML for the past two school years for homework assignments, classwork assignments, and quizzes with my 7th and 8th grade math classes. Since I use MML to this extent, it is imperative to have more MML tasks that are closely aligned with a CCSS-based curriculum, such as the EngageNY curriculum.

There have been many positive outcomes with my students at Sherwood Middle School as a result of implementing MML. Using MML has opened a new avenue for teacher and student communication that I may not have gained without the program. Students email specific problems they would like to review in class by using the “Ask My Instructor” feature, as shown in Figure 1. Many of these students are more quiet and reserved than others and do not
necessarily feel comfortable asking questions in class. Students also come to the classroom between classes, before school, after school, or during my planning period to get help with MML or discuss a question from an assignment. Using MML has prompted many student-initiated mathematical discussions, which is an added benefit.

Another positive outcome is that most of the students who put forth effort when completing MML assignments and do well also perform at an advanced level on assessments. MML provides the practice and support that students need, especially with the immediate feedback provided. Students enjoy the convenience of MML being online, as well as the ability to receive personal assistance, immediate feedback, or extra instruction on each problem. Parents and students have expressed an overall positive response about this program. Many parents have said that it benefits their child more than traditional math homework from a textbook. Several of these positive comments have come from parents of students with learning difficulties. For example, a mom of a student with Attention Deficit

Figure 1: Student Emails through "Ask My Instructor"
Disorder said that her daughter is more focused when doing homework assignments and is able to complete these assignments independently by using the helpful features of the program. Overall, using MML has played a positive role in my classes.

Since Sherwood Middle School is on a block schedule, students are in my math class either twice a week (Tuesday and Thursday) or three times a week (Monday, Wednesday, and Friday). Not working with students daily in math has been a hindrance and has reinforced the fact that homework is an integral and necessary time for students to practice more frequently. Garner (1978) found in his study of 5th-, 8th-, and 10th-grade students, that 25 to 30 minutes of math homework a day in middle and high school would add more than 3½ years of time for practicing and mastering math (p. 8). Every minute practicing mathematics counts, because every problem has the potential to give a student a personal “aha” moment. Homework can be a valuable tool to reinforce mathematical thinking and concepts learned in class. While planning assignments, an educator should keep in mind that the assignment should help create a concrete understanding of concepts. Homework can also be designed to prepare students for future material and enhance lessons (Muhlenbruck, 1999, p. 314) (Paulu, 1995, p. 9). What kind of homework problems, when to give certain problems, and how many homework problems to assign are topics that are constantly questioned by teachers who desire to give their students valuable, time-worthy practice outside of class. Since MML is a key resource that I utilize, it is my responsibility to have more rigorous MML tasks and problems that are aligned with what my students are expected to learn based on the CCSS and the 7th grade EngageNY math curriculum.

The focus of this study is on beginning the process of designing and programming MML problems that are aligned with the EngageNY (Eureka Math) Common Core Curriculum. Through research and literature review, I learned about the importance of math homework,
distance education, online homework, CCSS, and the EngageNY Common Core Curriculum as well as how these topics pertain to my thesis work. With schools around the nation having to switch gears in their math classrooms to attain the depth of knowledge found within the CCSS, there is a necessity to have more rigorous tasks available for teachers to use with their students.

There are numerous options to continue the work in this thesis. One way to further this work is to finish programming the entire 7th grade EngageNY curriculum, including Problem Sets, Examples, Exercises, Sprints, and assessments. The remaining grade levels could also be programmed into MML in this way, and the course assignments within MML could be organized sequentially to match each module and lesson pacing. Also, multiple iterations of certain tasks could be created to form a question bank to give teachers options for additional reinforcement or practice. Another possibility for furthering this work would be to develop MML’s helpful features tailored to each of these problems. Other online math platforms, such as Zearn, UMathX, or ALEKS, could be explored and evaluated for the feasibility of similar tasks being developed in their format. Appendix A includes a booklet of the tasks as well as some guidance on how they could be implemented to complement the EngageNY curriculum. This booklet provides implementation ideas based on how I might use these problems in my classroom, but the materials that were created could be further developed and then used by any 7th grade math teacher in a way that fits their students’ needs.
MYMATHLAB

Math is a subject that requires practice that should benefit the students in a meaningful way. Having detailed instruction is helpful, particularly when there is a noticeable gap in many parents’ ability to assist their child with math homework. The parents’ inability to appreciate and instruct CCSS at home occurs especially as the student progresses to higher levels of math. Parents have said they “do not remember” or they “are not good at” the math their child is learning in 7th and 8th grade pre-algebra. Studies have shown that parents become increasingly less involved with their child’s homework as they go on to higher grade levels (Dauber, 1989, p. 12). The online math program, Pearson’s MyMathLab, is an interactive program that provides detailed assistance and examples along with instant feedback and grading. This has alleviated some of the pressure on parents who are not available or capable of helping their children with their homework.

When students are completing MML homework assignments and take advantage of the “Help Me Solve This” or “Show an Example” features that assist or give instruction on the problem, they are viewing example explanations, sometimes in written paragraphs. This expands their vocabulary and strengthens their ability to communicate in mathematics. These instructional features available through MML homework assignments were not implemented and utilized for the problems created for this thesis, but they could be developed in the future. Use of these features will become even more valuable when the new PARCC and Smarter Balanced assessments are implemented since these tests require more of a task-based approach with some written explanation. This is also another reason to have tasks from the EngageNY math curriculum programmed into MML. To answer questions in the short answer and multiple-choice version, which can be found in Versions 1.3 and 2.3 in Appendix A, students may have a more
guided experience through completing the task. If this version were used in combination with an essay version, whether it was digital or on paper, the students would have two similar tasks with two different ways to practice answering them. If students were assigned the guided version first, and then assigned the similar task as an essay response, they would retain more skills with answering task-based assessments while gaining more understanding of the concepts.

When completing homework assignments, students have the option to use the features shown in Figure 2. These features are not available when completing quizzes or tests through MML. From the Elayn Martin-Gay Pre-Algebra course, an example of “Help Me Solve This” is shown in Figures 3 and 4. The “Help Me Solve This” feature is dynamic in that the problem will always be identical to the current iteration of the problem the student must complete. This feature will take a student through steps to find the solution while inputting correct values into fill-in-the-blank spots in a guided approach. After the student has taken the appropriate steps through “Help Me Solve This,” the student is given a different iteration of the problem to solve in order to receive credit for completing the problem. An example of “View an Example” from the same problem is shown in Figures 5 and 6. “View an Example” remains static for each exercise, while providing a parallel example that is not algorithmically programmed to generate iterations like the exercise or “Help Me Solve This.” Both of these features will help students understand the process and steps to follow through with solving the problem and finding the solution. An image of the “Video” feature is shown in Figure 7.

FIGURE 2: MyMathLab Helpful Features
FIGURE 3: “Help Me Solve This”

FIGURE 4: “Help Me Solve This” continued
For the given proportion, find the unknown number $n$.

\[
\frac{15}{3} = \frac{75}{n}
\]

To find $n$, first find cross products.

\[
\frac{15}{3} \times \frac{25}{n}
\]

Find the first cross product. Multiply the numerator of the first fraction by the denominator of the second.

\[15 \cdot n\]

Now find the other cross product. Multiply the denominator of the first fraction by the numerator of the second.

\[\frac{3}{5} \cdot 75 = 45\]

Question is complete.

FIGURE 5: “View an Example”

For the given proportion, find the unknown number $n$.

\[
\frac{15}{3} = \frac{75}{n}
\]

\[
\frac{3}{5} \cdot 75 = 45
\]

Set the cross products equal to each other.

\[15 \cdot n = 45\]

To find $n$, divide 45 by 15, the number multiplied by $n$.

\[n = \frac{45}{15}\]

$n = 3$

Check to see that 3 is the unknown number.

Question is complete.

FIGURE 6: “View an Example,” continued
If a student answers a homework question incorrectly on the first attempt, the student will receive specific instruction and feedback pertaining to that question. For most questions a student can attempt the exercise three times with feedback given after each incorrect answer. After the number of permitted attempts is utilized, the exercise is marked incorrect. The correct answer is given and for most exercises the “Similar Exercise” option appears. Not all exercises have three attempts. Some only have two attempts and no “Similar Exercise” is offered. These are also settings that the teacher can adjust in the assignment settings in the assignment manager. The assignment settings include the number of attempts allowed per question, the learning aids made available to students, as well as other options, as shown in Figure 8. The immediate results from a quiz or immediate feedback from incorrectly answering a homework question allows the students to review missed problems and learn from their errors. Results are given to students for each exercise in a quiz and test only after submitting the entire
assessment, and feedback on quizzes and tests is limited to seeing the correct answer and the answer input by the student (P. Rouse, personal communication, June 30, 2014). In homework assignments, students get specific instruction and feedback immediately after each input, as shown in Figure 9. This feature and the helpful features shown in Figure 2 are available in homework assignments, but not quizzes or tests. For most exercises, a student can attempt a problem three times before it is marked wrong and he or she can choose the option to have a “Similar Exercise.” After attempting the exercise the permitted number of times, the correct answer is then given and the “Similar Exercise” option appears as shown in Figure 10. The “Similar Exercise” is the same question with the numeric values being algorithmically regenerated as shown in Figure 11. Being able to complete a “Similar Exercise” gives students numerous attempts to learn how to solve the problem and increase their mathematic skills.

FIGURE 9: Incorrect Answer Feedback
FIGURE 10: “Similar Exercise” button

FIGURE 11: “Similar Exercise”
In order to feel comfortable with the material, students can re-work a similar homework exercise using the “Similar Exercise” feature, as shown in Figures 10 and 11. Students can also re-take quizzes as many times as permitted to increase their grade, while not necessarily realizing they are improving their skills with each attempt. Assignments can also be re-opened by the teacher so that a student can improve his or her mathematical abilities and grade. These features in MML challenge the students to persevere until they have mastered a concept. In her thesis comparing MathXL (MyMathLab) and another online math program, Darlene Ford (2009) stated some of the benefits of using MathXL:

MathXL engages students in active learning—it is modular, self-paced, accessible anywhere with web access, and adaptable to individual learning styles. Some students need to be guided step by step, others work well by looking at an example and reading the text, and some others work better when observing and hearing someone work through a problem. All of these learning styles are available at the push of a button (p. 8).

Assessing student knowledge by giving an MML quiz or homework assignment is also appealing to teachers since the program automatically gives a grade for the students’ work without having to manually grade anything, with the exception of essay questions. The program also provides information concerning student access to an assignment, the length of time spent completing an assignment or problem, the time they last worked on an assignment, and the number of attempts for each problem, quiz, or test. These results provide data to the teacher, which allows the teacher to assess each student’s knowledge and be more aware of the individual student’s needs. The teacher has more information, as well as time, to plan lessons or spend one-on-one time assisting students. This is especially effective when the class is frequently in a lab setting.

As claimed on Pearson’s website, MyLab & Mastering (MML included) is “used by more than 11 million students each year” from colleges, high schools, and middle schools as a homework, practice, and assessment tool. Since the creation of MML in 2001, many college-
based studies have been conducted on the program, which leaves questions for further research in high school and middle school. In college-level math courses, MML is often used in a lab environment with the instructor introducing the information first, and then allowing time to work on MML in a computer lab where personal assistance is offered. At Sherwood Middle Academic Magnet School, which is an A rated school, a National Magnet School of Excellence, and a National Blue Ribbon School of Excellence, MML has been used since 2008 for classwork, homework, and assessments. In the Algebra I and Geometry courses offered at Sherwood, the teachers use MML as a key component for students to practice their skills. In the 2013-2014 school year, out of a total of 55 Geometry students, 54 students scored an Excellent and 1 scored a Good on their End-of-Course test. In Algebra I, all 58 students scored an Excellent. These are outstanding results, since Excellent is the highest level to attain on an End-of-Course test. With an increasing number of high schools and middle schools in Louisiana using MML, many teachers have attended the same CRP training I received from Phoebe Rouse at LSU. The 7th grade materials produced for this thesis are accessible to these CRP trained teachers, as well as others, to use. The EngageNY-based tasks would be beneficial to any teacher striving to attain the rigor of the CCSS through the use of MML.

Results in a University of Memphis study using MML showed a dramatic increase in class attendance, which helped the students retain information better and increased the success rate. There was also “a narrowing of the achievement gap between Black and White students” (Stewart, 2012, p. 12). MML changes the dynamic of the classroom, even when assigned as a homework assignment versus used in a lab setting. At Sherwood, MML is sometimes assigned as classwork, turning the classroom into a lab setting, but it is primarily assigned as homework assignments. When using MML in a lab setting, the teacher is able to work with students one-on-
one, which gives the teacher an idea of what each student is struggling with and allows the students to get personal and small group tutor sessions when needed. Relationship building is a byproduct of this time and is beneficial to the teacher and students in establishing and maintaining a positive learning environment. In a lab setting, when students are completing MML tasks and are allowed to help each other, they are deepening their own level of learning. When students teach each other, the “materials become part of a program invested with status and responsibility,” and the student that is teaching “is given the opportunity of building up his self-confidence” while enhancing skills (Frager, 1970, p. 403). Using MML for homework has opened up a different channel of communication with my students. I have found students initiate and feed conversations about mathematics they see through MML, especially the methods used in the helpful features, “Help Me Solve This,” “View an Example,” and “Video”. When used for homework, Dr. Maria Botelho, who was involved in Stewart’s (2012) study at University of Memphis, said, “With [MyMathLab] the evaluator is the computer, so the students see me [the teacher] as someone who is not there to judge them but to help them. It allows me [the teacher] to become more of a mentor, and this component is very positive” (p. 13). This has shown true in the middle school setting as well. Students will come to me with specific questions they want help with, creating a more positive, personal, and differentiated learning experience for that individual. Just the fact that it elicits conversations about mathematics with students is a positive success.

Feedback about student success and struggle is some of the most valuable information a teacher can receive. MML provides data that can reveal students’ individual struggles which allows educators to more effectively help each student in a meaningful way. When implementing some of the programmed EngageNY aligned MML tasks with my students, I will be able to see
how long they spend on the task and what parts they do not understand. This will reveal whether the students comprehend the material or not. Having the tasks programmed in MML allows the students to complete them as homework anywhere they have Internet access, which frees up class time, and it provides me, the teacher, with more data as well. Being able to assign certain pieces of the lessons for homework allows more class time for investigation and discussion. Even if a certain piece of a lesson were completed in class, like the problem set, it could be also assigned for homework to reinforce what the student learned in class. If the work in this thesis were further developed, more information could be programmed to allow the student to receive additional assistance or instruction on each problem through the “Help Me Solve This” or “View an Example” features. PowerPoint presentations, documents, and video lessons can be uploaded and made available through the program. The EngageNY lesson documents could be uploaded and linked to the corresponding MML tasks with this feature. Live chat, email, and announcements are also available to communicate with students through MML. The MML program has much to offer, and with further design and development, it would become an even more valuable asset.

In Epstein’s (2001) study about teachers’ roles in designing homework, she found that “Homework may increase each student’s involvement in learning, in applying specific skills and knowledge, and in conducting projects” (p. 182). By designing tasks aligned with the EngageNY curriculum for MML homework assignments, students will be required to be involved and apply more “specific skills and knowledge” to successfully complete the tasks. With the rigor of the new standards, it is imperative that students are continuously exposed to these kinds of problems when practicing and utilizing their math skills. If the student has not acquired the skills necessary to meet the standards, it is important for the teacher to know. The data from the CCSS-aligned
MML assignments will provide teachers with an assessment of their students’ capabilities. The goal as a teacher is for all students to meet the standards.

Integrating online math practice has many benefits, with the main benefit being student success. In a study at Fayetteville State University in North Carolina, the results about computer-generated interactive math homework were that the “student success rate as measured by percentage of ‘A, B, C’ grades is significantly higher in the MML students group (70%), compared with the traditional paper-based group (49%)” (Kodippili, 2008, p. 931). In a Pearson case study from the University of Idaho in 2004, the students were offered traditional homework or MML homework. It was “concluded that students who completed their homework with MyMathLab were far more successful in the course than students who chose the traditional homework option” (Stewart, 2012, p. 13). This is one example of the numerous case studies on Pearson’s website that give positive results from the use of their online math programs. They also have results from a December 2012 survey from 4,540 MyLab and Mastering students. In this survey, 88% of students surveyed feel the program helps them comprehend the material.

One of the factors of “success” in the elementary, middle, and high school level is to pass a standardized test every year for that grade level. Therefore, another valid reason to integrate online math practice is because of the new way students will be assessed. Something we must keep in mind as educators is the direction that assessments and curricula are going. It is expected that eventually students will be required to complete their entire math standardized test online instead on paper (Dessoff, 2012, p. 54). Students who have used MML or another online math program will be more comfortable with online math problems and showing work digitally. Not only do online math homework and assessments provide convenience for teachers and students,
but they are also important for students by providing experience with performing math online, which is the future of math assessment.

Assessments are not the only factor changing in education. Another area of growth is distance education, also known as distance learning. Distance education is giving instruction and facilitating learning for students who are not physically present in a traditional classroom setting. Distance education has been around for hundreds of years, but it has had a large boost since the Internet became popular in the 1990s. Distance education is possible with MML, and this concept has been applied through the LSU CRP. The CRP workshop addresses how to use online technology to redesign your course and effectively use MML (“College Readiness,” 2010). One of the requirements of the Louisiana Math and Science Teacher Institute (LaMSTI) at Louisiana State University is to take College Algebra and Trigonometry. These courses were facilitated as blended-learning distance classes, with a focus on digging deep into mathematic tasks during our face-to-face class led by Dr. James Madden. For the independent component of the College Algebra and Trigonometry courses, we completed MML assignments that focused on the fundamental mechanics of the subjects. Since I teach middle school mathematics and have not taken Algebra and Trigonometry since 2000 and 2001, I needed to use the e-textbook, “View an Example,” and “Help Me Solve This” features within MML to complete much of the independent online component. Through this experience, I have come to the conclusion that a determined, independent student could fully teach themselves mathematics with their MML course and the helpful resources within the course assignments.

MML provides a platform for distance education math courses and is already used in this manner in colleges and universities. This concept could be transferred to high school and middle school math courses, if it has not already been done. This would greatly benefit students that are
not allowed to attend school due to discipline records but still want to earn their GED, students that are homeschooled, students with schedule conflicts, or any student who does not attend school in a traditional setting. It would also be a good option for summer school students who either failed in a traditional class setting or want to advance during the summer and for students with disabilities or health issues who cannot attend regular classes. The students could learn the material through MML and then complete proctor-administered tests to determine whether the student succeeded. The Algebra I teacher at Sherwood Middle School, Cherie Neill, uses MML in a blended-learning course offered over the summer. The goal of this course is to cover 8th grade math in eight weeks over the summer so students can go from 7th grade math to Algebra I during the next school year. She assigns students twenty-two MML assignments to provide independent practice and meets with students a total of twelve days to cover material and assess their knowledge. Benefits of distance education include the flexibility and convenience it provides, as well as the potential to be differentiated to meet the individual’s needs. It is also typically lower in cost. The most relevant benefit to have CCSS-aligned tasks within MML is that it reinforces the 21st century movements as education is progressively becoming more digitalized and online.
COMMON CORE STATE STANDARDS IN THE ENGAGENY CURRICULUM

The purpose of this thesis is to report about the creation of MyMathLab (MML) problems that are aligned with the EngageNY Common Core Curriculum. This curriculum is open-access to the public on the Common Core Inc. EngageNY website and is linked to the New York State Education Department website as well. The curriculum can also be found on the Common Core, Inc. Eureka Math website with printed workbooks and modules available to purchase as shown in Figure 12 and 13. The EngageNY curriculum has been written, revised, and proofed thoroughly by over 150 teachers and mathematicians from around the United States, with over 20 of these people being from Louisiana. The writing teams that created the EngageNY curriculum studied the standards and progression documents, and they aimed to honor the content and practice standards as well as the instructional shifts embedded within them. All components of the curriculum went through iterative cycles of writing and review including receiving input and feedback from external review teams with New York State Education Department and the Student Achievement Partners. Throughout the writing process, each component of the curriculum was discussed and
debated starting with the module overviews and continuing all the way down to each piece of the lesson (C. Anderson, personal communication, June 26, 2014).

After being a participant of the formatting and copy-editing team for the EngageNY elementary math curriculum and using the 7th and 8th grade pre-algebra curriculum to teach students, it is my strong opinion that EngageNY is a thorough, well-written curriculum. It is aligned to meet the Common Core State Standards (CCSS) and its purpose is to prepare students for the Partnership for Assessment of Readiness for College and Careers (PARCC) assessments. Lynne Munson (2014), president and executive director of the non-profit organization Common Core, Inc., stated, “A student becomes fluent in math-as they do in any other subject-by following a course of study that builds their knowledge of the subject, logically and thoroughly. In Common Core’s curriculum, mathematical concepts follow the standards carefully and flow logically from Pre-Kindergarten through high school” (p. 2). The EngageNY curriculum has a deliberate, coherent flow to it. This is why the elementary, middle, and high school curriculums are referred to respectively as “A Story of Units,” “A Story of Ratios,” and “A Story of Functions.” The modules and lessons flow to present the mathematics as one cohesive story. The writers had a purpose for the specific order of the modules, the lessons within the modules, and each piece within the lesson. At each level, the sequence is intended to lead students toward mastery (C. Anderson, personal communication, June 26, 2014).

As curriculum progresses and is developed, the assessments must also be evaluated and appropriately modified. Assessments and curriculum are progressing and being developed. The PARCC assessment, a standardized assessment that will be used in many states, will be online. “The final, end-of-year summative assessment will require students to use computers or handheld devices to solve problems or think about mathematical issues” (Dessoff, 2012, p. 57).
This affirms another reason to create more CCSS-aligned online assignments and assessments so students can be accustomed to this type of work and be prepared for online standardized testing. MML gives students this experience.

Use of the CCSS began this year in East Baton Rouge Parish, which is where Sherwood Middle is located. The CCSS and the teacher evaluation system Value Added Model (VAM) compel educators to teach in a rigorous way that encourages the students to apply what they learn. The CCSS, and the new assessments that will soon accompany them, are a part of a national movement. Of the 43 states that have adopted the CCSS, fourteen of them have adopted the PARCC assessment as their future standardized assessment, and twenty-two states have adopted the Smarter Balanced assessment, which is similar to PARCC. PARCC will require students to answer “more rigorous questions about both mathematical practice and content” (Dessoff, 2012, p. 54).

The CCSS includes the Mathematical Practices used for grades K-12, which are based on NCTM standards and National Research Council’s report *Adding It Up*. These eight practices include making sense of problems and persevering in solving them, reasoning abstractly and quantitatively, constructing viable arguments and critiquing the reasoning of others, modeling, using appropriate tools, attending to precision, looking for and making use of structure, and looking for and expressing regularity in repeated reasoning. Problems that are in previous curricula and resources do not necessarily provide rigorous questioning that stimulates use of the Math Practices. The EngageNY curriculum prompts the use of these practices, so by including EngageNY problems in MML, the level of necessary rigor will be accessible to students who use this program. One of my goals for the creation of MML problems is to design and program rigorous tasks that will challenge students and require them to apply their knowledge, as well as
use the eight Math Practices. Using the 7th grade EngageNY math curriculum to program tasks into the MML platform makes this possible.
THE CCSS ALIGNMENT OF MML

The Common Core State Standards based 7th grade EngageNY math curriculum that was used to create MML problems includes a total of six modules. Each module includes exercises, example problems, timed sprints, problem sets, exit tickets, mid-module assessments and end-of-module assessments. Each component is designed in a way that can be implemented into MML homework assignments or quizzes, whether through multiple choice, numeric input, or essay. The exit tickets, mid-module assessments, the end-of-module assessments, and the exercises and problem sets from two lessons from Modules 1 and 2, as well as a sprint from Module 3, were the tasks programmed into MML for this proof-of-concept thesis. Exit tickets are typically 1-5 problems or one problem with multiple parts that assess the students’ knowledge gained from that particular lesson. The purpose of a mid-module-assessment is to assess students’ knowledge about halfway through the module. The end-of-module assessments’ purpose is to assess students at the end of the module. It will be especially beneficial to have these programmed for students to practice through homework or to assess student knowledge through a quiz or test since standardized assessments are increasingly becoming digital. Exercises and problem sets are components within each lesson, and sprints are used sparingly when a concept necessitates fluency practice. The EngageNY curriculum includes “a fluency exercise called a ‘sprint’ to develop students’ fluency with standard algorithms (routines for adding, subtracting, multiplying, and dividing whole numbers and fractions)” (Munson, 2014, p. 2). The topics of study in the first two modules come from the focus standards 7.RP.1, 7.RP.2, 7.RP.3, 7.G.1, 7.NS.A.1, 7.NS.A.2, 7.NS.A.3, 7.EE.A.2, 7.EE.B.4, which are given in Table 1 on the following page. The main ideas of these standards include ratio, proportion, scale, integer operations, and positive and negative rational numbers. Sixth, seventh, and eighth grade math are all considered
TABLE 2: CCSS in 7th Grade EngageNY Modules 1 and 2

<table>
<thead>
<tr>
<th>Analyze proportional relationships and use them to solve real-world and mathematical problems.</th>
<th>7.RP.1-Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1 / 2 miles per hour, equivalently 2 miles per hour.</th>
</tr>
</thead>
</table>
| 7.RP.2-Recognize and represent proportional relationships between quantities.  
  a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.  
  b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.  
  c. Represent proportional relationships by equations. For example, if total cost, t, is proportional to the number, n, of items purchased at a constant price, p, the relationship between the total cost and the number of items can be expressed at t = pn.  
  d. Explain what a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0,0) and (1,r), where r is the unit rate. |  |
| 7.RP.3-Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. |  |
| Draw, construct, and describe geometrical figures and describe the relationships between them. | 7.G.1-Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. |
| Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. | 7.NS.A.1-Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.  
  a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.  
  b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.  
  c. Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (−q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.  
  d. Apply properties of operations as strategies to add and subtract rational numbers. |
| 7.NS.A.2-Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.  
  a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (−1)(−1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.  
  b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then −(p/q) = (−p)/q = p/(−q). Interpret quotients of rational numbers by describing real-world contexts.  
  c. Apply properties of operations as strategies to multiply and divide rational numbers.  
  d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. |  |
| 7.NS.A.3-Solve real-world and mathematical problems involving the four operations with rational numbers. |  |
| Use properties of operations to generate equivalent expressions. | 7.EE.A.2-Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that “_increase by 5%” is the same as “multiply by 1.05.” |
| Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | 7.EE.B.4-Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  
  a. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? |
With limited time to complete all components of the EngageNY lessons at school, it is necessary to assign parts of the lessons for homework. In Epstein’s (2001) study of homework he states, “The homework process begins with teachers who choose the topics and content of assignments to help students meet particular learning goals. Thus, teachers not only assign homework, they also design homework. Designing homework requires teachers to consider the purpose, format, and other elements of assignments that will engage students and help them succeed” (p. 181). By transferring and using EngageNY problems in MML as part of homework assignments or in-class lab assignments, the students are more apt to get all or more components of the curriculum in an engaging format. With time constraints in the classroom or the need for further practice, it will be beneficial to be able to assign these problems as homework. When homework is more meaningful and has a purpose, more students will benefit from it (Epstein, 2001, p. 191). If students see a distinct connection with what they learn in class and their homework, the independent practice through homework tends to be more beneficial. It will make the lesson more significant, and students will be more inclined to complete their homework assignments.

EngageNY is a rigorous CCSS-based curriculum that challenges students. Most students will need extra reinforcement and more time than allotted in class to fully grasp the CCSS as presented in EngageNY. The thoroughness and precision of this curriculum has been driven by the challenge of the new assessments, standards and progression documents. Students will now be measured by their ability “to solve problems, think conceptually, reason mathematically, and demonstrate more skills than rote memorization” (Dessoff, 2012, p. 57). These abilities will be gained by applying the eight CCSS Mathematical Practices. This new way of assessing is another factor that encourages me to create new MML problems. Students will have to complete
more task-oriented problems that require them to use multiple skills. There can be several parts in each task that build upon each other. To better prepare students, they must be exposed to problems similar to what they will have on their assessments. The mid-module assessment, end-of-module assessment, and exit tickets, which are end-of-lesson assessments, are examples of what could be expected on future standardized assessments, such as PARCC. Having these tasks programmed into MML with regenerative values allows students to practice the problem multiple times, taking as much time needed, with different answers being required each time based on the algorithmic values. Once again, this allows students practice completing math tasks online.

The newly created MML problems have three versions. The first two versions of the questions are copied, including graphics and graphs, from the EngageNY curriculum. Since the problems copied from the 7th grade EngageNY math curriculum are for my personal, not commercial use, and no profit is made, there are no legal ramifications. On the EngageNY website, the terms of use for their copyright give the following stipulations:

Except as expressly provided to the contrary for any specific document(s) or material(s) published on EngageNY.org, permission to copy, use, and distribute materials created by and/or credited to EngageNY.org or the New York State Education Department (NYSED) and contained on EngageNY.org is hereby granted without fee for personal, private, and educational purposes, except that reproducing materials for profit or any commercial use is strictly forbidden without express prior written permission of NYSED. Any reproduction or distribution of such materials must expressly credit NYSED in a manner likely to inform any recipient as follows (Fill in information indicated by brackets and omit brackets): From EngageNY.org of the New York State Education Department. [Name of article/document.] Internet. Available from [specific webpage on EngageNY.org]; accessed [date, month, year].

Credit was given to NYSED through the announcement feature of MML, and this appears on the home page of the course. Before access to the course is shared with other teachers, inquiry of the legalities would have to be conducted with Common Core, Inc. To make the 7th grade EngageNY
math curriculum on MML an official product that is available to anyone using MML, a formal contract would most likely have to be made. One of the copied versions has instructions to complete on paper. In all, forty-four exit tickets, the two mid-module assessments, and the two end-of-module assessments were created for this version. The other version has instructions to complete an essay response on MML using the tools from the palette, which can be viewed in Appendix A. Again, forty-four exit tickets, the two mid-module assessments, and the two end-of-module assessments were created for this version. The first two versions each take about 6 hours per module to input the exit tickets and assessments into the MML program, so this took approximately twenty-four hours to complete. To complete the creation of either of these versions of the 7th grade EngageNY math curriculum Exit Tickets and assessments would take approximately 36 hours for each version, or 72 hours to do both versions. The third version, which includes problems similar to the other two versions in addition to regenerative algorithmic values, takes about an hour to program each exit ticket and about three hours to program each mid-module assessment and end-of-module assessment. A total of forty-three exit tickets were programmed with regenerating algorithmic values for this version, along with the two mid-module assessments and end-of-module assessments. The programmed problems took about fifty-five hours total to complete. To program all 139 exit tickets and the assessments from the 7th grade EngageNY math curriculum with regenerating algorithmic values would take approximately 175 hours. It requires more time to write new problems, program regenerating algorithmic values, and create new graphics and graphs. The regenerative feature allows students to have multiple versions of a problem, with only the numbers changing, so they can practice until they master the skill.
Various other programmed problems include 6 lesson examples, 1 lesson exercise, and 8 problem set problems from Module 1 Lessons 1 and 2. A sprint from Module 3 was also created by copying the material directly from the curriculum. There are 139 lessons total in the 7th grade EngageNY math curriculum. To program the entire 7th grade EngageNY math curriculum, including lesson examples, exercises, problem sets, exit tickets, and assessments would take approximately 556 hours to complete the lessons (4 hours per lesson) and 36 hours to complete the assessments (3 hours per assessment), which comes to a total of about 592 hours. This would require about 15 weeks of one person working 8 hours per day for 5 days a week to program the 7th grade EngageNY math curriculum alignment in MML.

To create and use MML problems, the following steps can be taken. The options to create homework assignments, quizzes, tests, or questions, are found in the “Assignment Manager” under the “Course Tools” tab. Figure 14 shows that the “Course Tools” tab is on the left, with “Assignment Manager” under it. Once in this window, the “Create Assignment” button allows the instructor to choose from the options shown in Figure 15. By selecting “Create Custom Question,” I was able to
create and program tasks from the EngageNY curriculum, which are found in Appendix A. The custom question list for the 7th grade EngageNY materials created for this thesis is partially shown in Figure 16. To create new questions, “Create New Question” should be selected. After questions are created, they can be assigned through homework, quizzes, or tests, as shown in Figure 15. The assignment titles could be given according to what lesson or lessons are being studied in class, for example Module 1: Lesson 1, as shown in Figure 17. When choosing questions to include in the assignment from the list of “Available Questions”, the custom questions will appear after selecting the check-box for “Show other custom questions” as shown in Figure 18.

FIGURE 16: 7th grade EngageNY Custom Question List and “Create New Question”
FIGURE 17: Creating assignments using the 7th grade EngageNY materials from Appendix A

FIGURE 18: Creating assignments using the 7th grade EngageNY materials from Appendix A
FURTHER DEVELOPMENT

As I began to create MML tasks aligned to the CCSS-based 7th grade that could be used in my classes, I thought of research questions for observational study:

- Do these MML questions help students improve their performance in mathematics, as the Common Core wants them to perform, and how will the teacher know?
- How will these questions benefit students?
- How do they help students improve?
- How can students’ knowledge be assessed to see how they improve?

As stated, these problems are a proof of concept. Continuing the programming of problems including the examples, exercises, problem sets, exit tickets, assessments, and sprints from all modules from each grade level K-12 would be a step towards furthering this study. Also, research could be conducted with the EngageNY-aligned MML problems to test the effectiveness on student learning.

Converting EngageNY problems to have online accessibility with regenerative numeric values will benefit many. It will not only benefit teachers by saving time, but also millions of students who use online programs will have access to valuable resources. Having MML problems aligned with CCSS also has the potential to benefit students that are not in a traditional school setting. Distance is not an issue with online learning (Akdemir, 2010, p. 48). When programming problems to be used in homework assignments, there is capability to input instructional assistance in the “Help Me Solve This” and “Show Me an Example” features on MML. If a student misses a question in a homework assignment, automatic feedback can be provided to the student so they understand how to correct their errors. These features were not
utilized for the problems created for this thesis, but they would be very beneficial to students if they were offered.

In order to create more types of problems with certain features, such as the ability for students to input various answers, further training with programming as well as further development of the MML program would be necessary. Having the capability and knowledge of how to input coordinate planes for the students to manipulate lines and coordinates would improve the Module 1 assignments. Also, being able to have multiple choice, short answer, and essay answers within one problem would be beneficial. The program currently allows essay answers, but not with a combination of other inputs. It would also fit the format of EngageNY curriculum to allow students the ability to give diverse answers. For example, in the exit ticket for Module 2 Lesson 4, one of the questions requires students to write an equation that gives a sum of two numbers that equal a negative mixed number. The only way to allow students to input varied answers in this type of question is through an essay response. It is possible that MML already has the capabilities to create all the different kinds of questions needed, and that training would be the only thing necessary for me to develop better-quality Common Core aligned problems.

Pearson’s MyMathLab is just one of many online math programs that strive for the same results with student success. MML allows you to assign questions and assignments in a specific, sequential order, which is essential to the setup and use of EngageNY curriculum. There are other online programs, such as ALEKS, Zearn, or UMathX, that could provide greater benefits to students if they were evaluated and aligned to contain more rigorous CCSS problems and tasks. There is a definite need to ensure that online math programs contain tasks that reach the depth of knowledge that the CCSS requires. ALEKS is tailor-made to fit each individual’s needs through
automatic adaptive instruction, practice, and assessment, and it keeps them informed through an Assessment Report as shown in Figure 19. Adaptive instruction means the order of the lessons can change based on student performance. Although ALEKS is aligned with the CCSS, it would not be the best fit with this specific curriculum since EngageNY is setup to flow in a specific order. Changing the order of the way concepts are presented in the EngageNY curriculum could cause a student to miss out on grasping certain concepts. MML allows the teacher to customize assignments with tasks in specific order, so it would work better with the EngageNY curriculum. The EngageNY curriculum could also be fully implemented in an interactive, visually appealing platform, such as UMathX or Zearn. As many states transition to CCSS, educators must consciously reflect on what works best for their students and how to improve their education.

Ideally, all EngageNY lesson components will be programmed into MML. Teachers that use MML will have the ability to implement the EngageNY curriculum in a way that works best with their students, whether it is digitally, on paper, or a combination of these. Some teachers may want to use the EngageNY student printed workbooks to review the exercises and examples, and then assign the online Problem Sets, Exit Tickets, and assessments through MML. Some teachers may want students to complete everything digitally so that it is easily accessible and organized online, which will allow students to review at their leisure and create a sort of math
portfolio. Students and teachers could have less paper materials to organize and maintain if MML were used. In most classrooms, a combination of the paper version and the online version would probably be used. This would allow the choice of using either version based on the nature of the learning objective, individual student needs, or based on the needs of a certain class.
REFERENCES


Rouse, P. *College readiness, dual credit, and the CCSS* [PowerPoint slides]. Retrieved from https://www.math.lsu.edu/programs/CollegeReadiness/Presentations


CONTENTS

INTRODUCTION .................................................................................................................. 45

HOW TO IMPLEMENT ......................................................................................................... 47

MODULE 1

VERSION 1.1: Copied Version with Essay Input ................................................................. 52
VERSION 1.2: Copied Version with Paper ........................................................................... 75
VERSION 1.3: Regenerative Version with Digital Input ..................................................... 98

MODULE 2

VERSION 2.1: Copied Version with Essay Input ................................................................. 125
VERSION 2.2: Copied Version with Paper ........................................................................... 150
VERSION 2.3: Regenerative Version with Digital Input ..................................................... 175

ADDITIONAL PROBLEMS .................................................................................................... 210
INTRODUCTION

The excerpts in this booklet are from Pearson’s MyMathLab. Module 1 and 2 from the CCSS 7th grade EngageNY math curriculum were used to create the materials in this booklet. Three different versions of each task were created. The materials include Module 1 and 2 exit tickets, mid-module assessments, and end-of-module assessments. There are also some additional materials.

Versions 1.1 and 2.1 are copied versions with essay input. All essay input questions must be assigned through quizzes or tests. The tasks were copied directly from 7th grade EngageNY math curriculum. This version requires the student to answer the questions in the essay box below the task, using the palette as needed. Here are the tools that can be included on the palette: operation signs, inequality signs, does not equal, equal, fraction, mixed number, exponent, absolute value, square root, ordered pair, pi, etc. The instructor can edit the palette tools to make certain items available.

A second version, found in Versions 1.2 and 2.2, is also copied directly from EngageNY, but it requires the student to answer the question on loose-leaf paper to turn in to the teacher. Versions 1.3 and 2.3 of the exit tickets and assessments are similar to the copied version. Most of these exit tickets and assessments have regenerative numerical values. They also have multiple choice and short answer inputs that are programmed with those values.
In Module 1 there are 22 lessons total, but Lesson 21 does not have an exit ticket. The Module 1 assessments and exit tickets are included in three versions. The first two versions are copied from EngageNY curriculum, and the third version is programmed problems that will give the student a grade. However, in this third version found in the section Version 1.3, Lesson 6 could not be recreated or varied from the copied version because it is activity-specific. Lesson 10 has essay answer input because of the nature of the problem. Lesson 20 requires the student to draw a room layout on graph paper and turn in to the teacher. Lesson 21 did not have an exit ticket. In Module 2, there are a total of twenty-three exit tickets, mid-module assessment, and the end-of-module assessment in each section. There are also three versions of Module 2 exit tickets and assessments. In the section Version 2.3, there are 23 programmed exit tickets, the mid-module assessment, and the end-of-module assessment.

The Additional Problems include 6 lesson examples, 1 lesson exercise, and 8 problem set problems from Module 1 Lessons 1 and 2, as well as a sprint from Module 3. Some of these problems have regenerative values. The 7th grade EngageNY Module 3 Lesson 12 sprint does not have regenerative values within the problem. There is potential to create multiple sprints, or input certain regenerative values. However, sprints are carefully designed in their progression of problems, so the numbers used would have to provide a specific experience for the student. Sprints could be assigned to a student with a certain amount of time to complete it if assigned as a timed test.
HOW TO IMPLEMENT

The materials provided are from the 7th grade EngageNY math curriculum. They are ready to implement after copying the MML course 7th Grade EngageNY. Once the course is copied, to create an assignment with these problems, follow the steps below.

STEP 1: Once in your course, click on the “Course Tools” tab. Under “Course Tools,” you will find the “Assignment Manager.” This allows you to create, view, assign, and edit different assignments.
STEP 2: Once you are in the “Assignment Manager”, select “Create Assignment” and then “Create Homework/Quiz/Test.”

STEP 3: After choosing what kind of assignment to create, you must give it a title. If following the EngageNY curriculum, you could name the assignment based on which Module and Lesson you are studying, such as Module 1: Lesson 1.
STEP 4: After giving your assignment a title, you can choose which questions to include. By selecting the checkbox “Show other custom questions,” you will be able to add the materials from this booklet. After selecting “Show other custom questions,” the materials from this booklet will be in the “Available Questions” to add to the assignment. The exit tickets are given a question ID with the grade level, module number, lesson number, and ET for exit ticket. They are also labeled as paper, essay, or new. These are the three versions available. An example of a lesson ticket question ID is 7.1.3.ET (essay), which would be 7th grade Module 1 Lesson 3 Exit Ticket with the essay input. The mid-module assessments and end-of-module assessments are similarly named, but instead of ET, they are MMA and EMA. The exit tickets, which are like an end-of-lesson assessment, the mid-module assessment, the end-of-module assessment, and the various problems from Module 1 and Module 2 have been provided. The Module 3 Lesson 12 sprint has also been provided. These tasks will work well to complement the other lesson components.
Each lesson typically has examples, exercises, and problem sets to discuss and review prior to completion of the exit tickets. After students have learned the lesson material through the examples, exercises, and problem sets, they could be given extra practice problems, if necessary. These could be problems from the already programmed Pearson textbook database for the course. There are numerous Pearson problems that could be used to practice the skills from the lessons from EngageNY. The Exit Ticket could be assigned as the final problem of that MML assignment. The Lesson exit tickets could be assigned as classwork or homework. The options are to assign it to be completed on paper, as a digital essay, or digitally with multiple choice and numeric value answers. Since Versions 1.3 and 2.3 have problems that vary from the original versions, these could be assigned along with one of the original versions. For example, Module 2 Lesson 12 could be assigned as the original version of the problem with essay input, as well as the similar regenerative version with multiple choice and numeric value answers being required. They are very similar questions, but having students answer both types of tasks could provide the teacher with valuable information about the students’ knowledge. It would also give the student different answer forms to practice. The method a teacher chooses to deliver the exit ticket may vary depending on the nature of the task. Ideally, all lesson components, including examples, exercises, problem sets, and exit tickets, will be programmed into MML. When this occurs, a teacher could discuss the programmed tasks with the students as they complete them in a lab setting. They could also be taught separate from MML, and then assigned for independent work through MML as a way to reinforce the concept. There are numerous options with how to implement these MML problems, but each teacher should do what works best with their students. Even if a teacher is not fully implementing EngageNY math curriculum, the exit tickets and assessments can provide valuable practice for students and data for the teacher as well. It is important to test and observe how students perform on CCSS-based assessments. The EngageNY
curriculum exit tickets allow the teacher to assess students’ knowledge on a specific skill or standard, and the mid-module and end-of-module assessments allow the teacher to assess students’ knowledge on numerous skills or standards.
M1-L1 Exit Ticket: QUESTION ID 7.1.1 (essay)

1. After seeing this video, another dog owner named his dog, Lightning, to try to break Tillman's skateboarding record. Lightning's fastest recorded time was on a 75-meter stretch where it took him 1.55 seconds. Based on this data, did Lightning break Tillman’s record for fastest dog on a skateboard? Explain how you know.

2. Watch the video of Tillman the English Bulldog, the Guinness World Record holder for Faster Dog on a Skateboard.

Is your classmate correct, and how do you know?

Complete. M1-L1 Exit Ticket and we will discuss various answers in class. Number your answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.
Mr. Aho decided to make juice to serve along with the pizza at the Student Government party. The directions said to mix 2 scoops of powdered drink mix with a half a cup of water. At each table, the students said he will mix 8 scoops with 2 gallons of water to set up a pitcher. How can you use the fraction to complete the recipe?

Complete M1-L2 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

Enter your answer in the form of an essay.
Complete M1-L3 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

The table below shows the price for the number of roses indicated.

<table>
<thead>
<tr>
<th>Number of Roses</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (Dollars)</td>
<td>9</td>
<td>18</td>
<td>27</td>
<td>36</td>
<td>45</td>
</tr>
</tbody>
</table>

Is the price proportional to the number of roses? How do you know?

Find the cost of purchasing 30 roses.

Enter your answer in the form of an essay.
Complete M1-L4 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

The table below shows the relationship between the side lengths of a regular octagon and its perimeter.

<table>
<thead>
<tr>
<th>Side Lengths, s (inches)</th>
<th>Perimeter, P (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Complete the table by giving the values for Side Lengths of 9 and 12 in your answer.

If Gabby wants to make an octagon with a side length of 20 inches using wire, how much wire does she need? Justify your reasoning with an explanation of whether perimeter is proportional to the side length.

Enter your answer in the form of an essay.
Complete M1-L5 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the palette to insert fractions.

1. The following table gives the number of people in various age intervals in a town and the corresponding number of people that these people worked part-time/seasonal.

   | Age Group | Number
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-15</td>
<td>20</td>
</tr>
<tr>
<td>16-25</td>
<td>30</td>
</tr>
<tr>
<td>26-35</td>
<td>40</td>
</tr>
<tr>
<td>36-45</td>
<td>50</td>
</tr>
<tr>
<td>46-55</td>
<td>60</td>
</tr>
<tr>
<td>56+</td>
<td>70</td>
</tr>
</tbody>
</table>

Graph the data on the blank graph provided and graph each set of data using a different color.

2. Give values that you could fill in the table to create quantities proportional to each other and graph them on your own paper.
Complete M1-L6 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Which graph in the art gallery walk represented proportional relationships and which did not? List the group number.

2. What are the characteristics of the graph that represent proportional relationships?

3. For the graph representing proportional relationships, what does (0,0) mean in the context of the given situation?
Shaun and John are buying cold drinks for a neighborhood picnic. Each person is expected to drink one can of soda. Shaun says that if you multiply the unit price for a 12-pack of soda by the number of people, you will be able to determine the total cost of the soda. John says that if you divide the cost of a 12-pack of soda by 12, you will be able to determine the unit price per can of soda. Which one of their strategies should we use?
Complete M1-L8 Exit Ticket and we will discuss various answers in class. Letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

John and Amber work at an ice cream shop. The hours worked and wages earned are given for each person.

John's Wages

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Wages ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
</tr>
</tbody>
</table>

Amber's Wages

Enter your answer in the form of an essay.
Complete Module 1 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

Oscar and Maria each wrote an equation that they felt represented the proportional relationship between distance in kilometers and distance in miles. One entry in the table paired 150 km with 93 miles. If \( k \) = number of kilometers and \( m \) = number of miles, who wrote the correct equation that would relate miles to kilometers? Explain why.

a. Oscar wrote the equation \( k = 1.61m \), and he said that the rate 1.61/1 represents miles per km.

b. Maria wrote the equation \( k = 0.62m \) as her equation, and she said that 0.62 represents miles per km.

Enter your answer in the form of an essay.
Complete M1-L10 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

Great Rapids White Watering Company rents rafts for $125 per hour. Explain why the point (0,0) and (1,125) are on the graph of the relationship, and what these points mean in the context of the problem.
Complete M1-L11 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

Which is the better buy? Show your work and explain your reasoning.

3 1/4 lb. of turkey for ten and one-quarter dollars

2 1/2 lb. of turkey for six and one-quarter dollars

Enter your answer in the form of an essay.
Complete M1-L12 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

If 1 lb. of candy cost $2.99, how much would 1 lb. of candy cost?
Complete M1-L13 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

The table below shows the combination of dry prepackaged mix and water to make concrete. The mix says for every 1 gallon of water stir 60 pounds of dry mix. We know that 1 gallon of water is equal to 8 pounds. Using the information provided in the table, find the remaining parts of the table and give them in your explanation.

<table>
<thead>
<tr>
<th>Dry Mix (pounds)</th>
<th>Water (pounds)</th>
<th>Total (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>10</td>
<td>14 1/6</td>
</tr>
<tr>
<td>4 1/2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enter your answer in the form of an essay.
Complete M1-L14 Exit Ticket and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. A bicycle shop advertised all mountain bikes priced at a $\frac{1}{3}$ discount.
   a. What is the amount of the discount if the bicycle originally costs $327? 
   b. What is the discount price of the bicycle? 
   c. Explain how you found your solution to part b.

2. A hand-held digital music player was marked down by $\frac{1}{4}$ of the original price.
   a. If the sales price is $128.00, what is the original price? 
   b. If the item was marked up by $\frac{1}{2}$ before it was placed on the sales floor, what was the price that the store paid for the digital player? 
   c. What is the difference between the discount price and the price that the store paid for the digital player?
Complete M1-L15 Exit Ticket and we will discuss various answers in class. Number the answers to the question. Use the palette to insert fractions, mathematical symbols, etc.

Using the graph and its title:

1. Describe the relationship that the graph depicts.
2. Identify two points on the line and explain what they mean in the context of the problem.
3. What is the unit rate?
4. What point represents the unit rate?
Complete Module 1 Exit Ticket and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

Use the following figure on the graph for problems 1 and 2.

1. a. If the original lengths are multiplied by 2, what are the new coordinates?
   b. On your own paper, use a table to organize lengths. Give a description of your table in your explanation below.

<table>
<thead>
<tr>
<th>Actual Picture Lengths (in units)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New Picture Lengths (in units)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enter your answer in the form of an essay.
A rectangular pool in your friend's yard is 150 ft. x 400 ft. Create a scale drawing with a scale factor of \( \frac{1}{600} \). Use a table or equation to show how you computed your scale drawing lengths. Give an explanation of your table or equation and describe your scale drawing by giving the dimensions.
A drawing of a surfboard in a catalog shows its length as $\frac{4}{9}$ inches. Find the actual length of the surfboard if 1 inch length on the drawing corresponds to $3$ feet of actual length.
Complete M1-L19 Exit Ticket and we will discuss various answers in class. Letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. A 1-inch length in the scale drawing below corresponds to a length of 12 feet in the actual room.

   ![](image)

   a. Describe how the scale or the scale factor can be used to determine the area of the actual dining room.
   b. Find the actual area of the dining room.
   c. Can a rectangular table that is 7 ft. long and 4 ft. wide fit into the narrower section of the dining room (where the arrow is pointing)? Explain your answer.

Enter your answer in the form of an essay.
Complete Module 1 Exit Ticket and we will discuss various answers in class. Number the answers to the question. Use the palette to insert fractions, decimals, and labels.

QUESTION ID 7.1.20 (essay)

1. Your classroom is just moved into a new apartment in Munich and has sided you to be the designer. Indicate the placement of the following objects on the floor plan using the smallest scale possible (1 cm = 20 ft, 1 mm = 8 ft, 1 cm² = 20 ft², and 1 cm³ = 8 ft³). The scale for the grid on the floor plan is 1 cm = 2 ft. Each square on the grid is 1 cm². (600 ft², by 60 ft, 3 ft by 9 ft, and 15 ft by 15 ft.)

2. Choose one object and explain the procedure to find the scale lengths.
Complete M1-L22 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

The school is building a new wheelchair ramp for one of the remodeled hallways. The original drawing was created by the contractor, but the principal drew another scale drawing to see the size of the ramp relative to the walkways surrounding it. Find the missing values on the table and explain how you can fill them in.

Original Scale Drawing:
- 3 in.
- 12 in.

Principals Scale Drawing:
- 1 in.

New Scale Factor of SD2 to the actual ramp: 1/100

<table>
<thead>
<tr>
<th>Actual Ramp</th>
<th>Original Scale Drawing</th>
<th>Principals Scale Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in.</td>
<td>12 in.</td>
<td>12 in.</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1/100</td>
</tr>
</tbody>
</table>

Enter your answer in the form of an essay.
Complete M1-Mid-Module Assessment and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Josiah and Tillery have new jobs at YumYum's Ice Cream Parlor. Josiah is Tillery's manager. In their first year, Josiah will be paid $14 per hour and Tillery will be paid $7 per hour. They have been told that after every year with the company, they will each be given a raise of $2 per hour. Is the relationship between Josiah's pay and Tillery's pay rate proportional? Explain your reasoning using a table (Turn the table in separately on paper).

2. A recent study claimed that in any given month, for every 5 text messages a boy sent or received, a girl sent or received 7 text messages. Is the relationship between number of text messages sent or received by boys proportional to the number of text messages sent or received by girls? Explain your reasoning using a graph on the coordinate plane (Turn the graph in separately on paper).

3. When a song is sold by an online music store, the store takes some of the money and the singer gets the rest. The graph below shows how much money a pop singer makes given the total amount of money brought in by one popular online music store from sales of the song.

![Graph showing sales by an online music store with points at (0,0), (200, 40), (400, 120), (600, 200), (800, 280), (1000, 360), and (1200, 440).]
Complete M1-End-of-Module Assessment and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. It is a Saturday morning and Jeremy has discovered he has a leak coming from the water heater in his attic. Since plumbers charge extra to come out on weekends, Jeremy is planning to use buckets to catch the dripping water. He places a bucket under the drip and steps outside to walk the dog. In half an hour the bucket is 1/5 of the way full.
   a. What is the rate at which the water is leaking?
   b. Write an equation that represents the relationship between the number of buckets filled, in x hours.
   c. What is the longest that Jeremy can be away from the house before the bucket will overflow?

2. Farmers often plant crops in circular areas because one of the most efficient watering systems for crops provides water in a circular area. Passengers in airplanes often notice the distinct circular patterns as they fly over land used for farming. A photographer takes an aerial photo of a field on which a circular crop area has been planted. He prints the photo out and notes that 2 centimeters of length in the photo corresponds to 100 meters in actual length.

   a. What is the scale factor of the photo?
   b. If the dimensions of the entire photo are 25 cm by 20 cm, what are the actual dimensions of the rectangular land area in meters captured by the photo?
1. Watch the video clip of Tillman the English Bulldog, the Guinness World Record holder for Fastest Dog on a Skateboard.

At the conclusion of the video, your instructor takes out his or her calculator and says, “Wow that was amazing! That means the dog went about 5 meters in 1 second.”

a. Explain how you know.

b. Estimate the speed of the dog’s skateboard.

2. After seeing this video, another dog owner found the dog’s skateboarding record. Lightning’s Staffordshire Terrier set a new record by skating 300 meters in 21 seconds. Based on the data, did Lightning’s record beat Tillman’s record for the fastest dog on a skateboard? Explain how you know.
Mr. Acher decided to make juice to serve along with the pizza at the Student Government party. The directions said to mix 2 scoops of powdered drink mix with a half a batch of water to make each pitcher of the juice. One of Mr. Acher’s students said he will mix 8 scoops with 2 gallons of water to set 4 pitchers. How can you use the dilution formula to determine the amount of juice to make?
M1-L3 Exit Ticket: QUESTION ID 7.1.3 (paper)

Complete M1-L3 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

The table below shows the price for the number of roses indicated.

<table>
<thead>
<tr>
<th>Number of Roses</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (Dollars)</td>
<td>9</td>
<td>18</td>
<td>27</td>
<td>36</td>
<td>45</td>
</tr>
</tbody>
</table>

Is the price proportional to the number of roses? How do you know?

Find the cost of purchasing 30 roses.
Complete M1-L4 Exit Ticket on loose-leaf paper and turn in to the assigned due date.

The table below shows the relationship between the side lengths of a regular octagon and its perimeter.

If Gabby wants to make an octagon with a side length of 20 inches using wire, how much wire does she need? Justify your reasoning with an explanation of whether perimeter is proportional to the side length.

<table>
<thead>
<tr>
<th>Side Length (inches)</th>
<th>Perimeter (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>7</td>
<td>56</td>
</tr>
<tr>
<td>8</td>
<td>64</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
</tr>
</tbody>
</table>
1. The following table gives the number of people picking strawberries in a field and the corresponding number of hours that these people worked picking strawberries. Graph the table. Does the graph represent two quantities that are proportional to each other? Explain why or why not.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

2. Fill in the table and given values to create quantities proportional to each other and graph them.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>
Complete M1-L6 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Which graphs in the art gallery walk represented proportional relationships and which did not? List the group numbers.

2. What are the characteristics of the graph that represent proportional relationships?

3. For the graphs representing proportional relationships, what does (0,0) mean in the context of the given situation?
Saman and John are buying cold drinks for a neighborhood picnic. Each person is expected to drink one can of soda. Saman says that if you multiply the unit price for a case of soda by the number of people attending, you will be able to determine the total cost of the soda. John says that if you divide the cost of a 12-pack of soda by 12, you will determine the unit price of the soda. Who is correct?
Complete M1-L8 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

John and Amber work at an ice cream shop. The hours worked and wages earned are given for each person.

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>John's Wages (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wages ($)</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
</tr>
</tbody>
</table>

Determine whether John's wages are proportional to time. If they are, determine the unit rate. If not, explain why not.
Complete M1-L9 Exit Ticket on loose leaf paper and turn in by the assigned due date.

Oscar and Maria each wrote an equation that they felt represented the proportional relationship between distance in kilometers and distance in miles. One entry in the table stated 150 km with 93 miles. If \( k \) = number of kilometers and \( m \) = number of miles, who wrote the correct equation that would relate miles to kilometers? Explain.

a. Oscar wrote the equation \( k = 0.62m \), and he said that the rate 1.61/1 represents miles per km.

b. Maria wrote the equation \( k = 0.62m \) as her equation, and she said that 0.62 represents miles per km.
Module 1: Exit Tickets and Assessments

Text:

Complete M1-L10 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Great Rides White Water Company rents raft for $125 per hour. Explain why the point (0,0) and (1,125) are on the graph of the relationship, and what these points mean in the context of the problem.
Complete Module 1 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Which is the better buy? Show your work and explain your reasoning.

3 1/2 lb of turkey for ten and one-half dollars

2 1/2 lb of turkey for six and one-quarter dollars
Complete M1-L12 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

If ¾ lb. of candy cost $20.50, how much would 1 lb. of candy cost?
Complete M1-L13 Exit Ticket on loose leaf paper and turn it in by the assigned due date.

The table below shows the combination of dry prepackaged mix and water to make concrete. The mix says for every 1 gallon of water stir 60 pounds of dry mix. We know that 1 gallon of water is equal to 8 pounds. Using the information provided in the table, complete the remaining area of the table.

<table>
<thead>
<tr>
<th>Dry Mix (pounds)</th>
<th>Water (pounds)</th>
<th>Total (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>14.2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Complete M1-L14 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. A bicycle shop advertised all mountain bikes priced at a \( \frac{1}{2} \) discount.
   a. What is the amount of the discount if the bicycle originally costs $327?
   b. What is the discount price of the bicycle?
   c. Explain how you found your solution to part b.

2. A hand-held digital music player was marked down by \( \frac{1}{4} \) of the original price.
   a. If the sales price is $128.00, what is the original price?
   b. If the item was marked up by \( \frac{1}{2} \) before it was placed on the sales floor, what was the price that the store paid for the digital player?
   c. What is the difference between the discount price and the price that the store paid for the digital player?
Complete M1-L15 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Using the graph and its title:

1. Describe the relationship that the graph depicts.
2. Identify two points on the line and explain what they mean in the context of the problem.
3. What is the unit rate?
4. What point represents the unit rate?
Use the following figure on the graph for problems 1 and 2.

1. If the original lengths are multiplied by 2, what are the new coordinates?
2. Use the table to organize lengths.

<table>
<thead>
<tr>
<th>Original Lengths</th>
<th>New Picture Lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A rectangular pool in your friend's yard is 150 ft x 400 ft. Create a scale drawing with a scale factor of \( \frac{1}{600} \). Use a table or equation to show how you computed your scale drawing lengths.
A drawing of a surfboard in a catalog shows its length as 3 inches. Find the actual length of the surfboard if 1 inch on the drawing corresponds to 8 foot of actual length.
Complete M1-L19 Exit Ticket ticket on loose-leaf paper and turn it in by the assigned due date.

1. A 1-inch length in the scale drawing below corresponds to a length of 12 feet in the actual room.

a. Describe how the scale or the scale factor can be used to determine the area of the actual dining room.

b. Find the actual area of the dining room.

c. Can a rectangular table that is 7 ft long and 4 ft wide fit into the narrower section of the dining room (where the arrow is pointing)? Explain your answer.
1. Your sister has just moved into a loft-style apartment in Manhattan and has asked you to be her designer. Indicate the placement of the following objects on the floor plan: Bed (96 in. by 80 in.), side table (36 in. by 18 in.), and dining table (48 in. by 48 in.). In the following scale drawing, I can

2. Choose one object and explain the procedure to find the scale lengths.
The school is building a new wheelchair ramp for one of the remodeled classrooms. The original drawing was created by the contractor, but the principal drew another scale drawing to see the size of the ramp relative to the walkways surrounding it. Find the missing values on the table.

<table>
<thead>
<tr>
<th>Original Drawing</th>
<th>Actual Ramp</th>
<th>Principal's Scale Drawing</th>
<th>Principal's Scale Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 in.</td>
<td>3 in.</td>
<td>1</td>
<td>75</td>
</tr>
</tbody>
</table>

New Scale Factor of SD to the actual ramp: $\frac{1}{75}$.
Complete M1-Mid-Module Assessment on loose-leaf paper and turn it in by the assigned due date.

1. Josiah and Tillery have new jobs at YumYum’s Ice Cream Parlor. Josiah is Tillery’s manager. In their first year, Josiah will be paid $14 per hour and Tillery will be paid $7 per hour. They have been told that after every year with the company, they will each be given a raise of $2 per hour. Is the relationship between Josiah’s pay and Tillery’s pay rate proportional? Explain your reasoning using a table.

2. A recent study claimed that in any given month, for every 5 text messages a boy sent or received, a girl sent or received 7 text messages. Is the relationship between number of text messages sent or received by boys proportional to the number of text messages sent or received by girls? Explain your reasoning using a graph on the coordinate plane.

3. When a song is sold by an online music store, the store takes some of the money and the singer gets the rest. The graph below shows how much money a pop singer makes given the total amount of money brought in by one popular online music store from sales of the song.
Complete M1-End-of-Module Assessment on loose-leaf paper and turn it in by the assigned due date.

1. It is a Saturday morning and Jeremy has discovered he has a leak coming from the water heater in his attic. Since plumbers charge extra to come out on weekends, Jeremy is planning to use buckets to catch the dripping water. He places a bucket under the drip and steps outside to walk the dog. In half an hour the bucket is 1/2 of the way full.
   a. What is the rate at which the water is leaking?
   b. Write an equation that represents the relationship between the number of buckets filled, in x hours.
   c. What is the longest that Jeremy can be away from the house before the bucket will overflow?

2. Farmers often plant crops in circular areas because one of the most efficient watering systems for crops provides water in a circular area. Passengers in airplanes often notice the distinct circular patterns as they fly over land used for farming. A photographer takes an aerial photo of a field on which a circular crop area has been planted. He prints the photo out and notes that 2 centimeters of length in the photo corresponds to 100 meters in actual length.
   a. What is the scale factor of the photo?
   b. If the dimensions of the entire photo are 25 cm by 20 cm, what are the actual dimensions of the rectangular land area in meters captured by the photo?
   c. If the area of the circular area on the photo is $64\pi$ cm², what is the actual area of the circular crop area in square meters?
SECTION 1.3: REGENERATIVE VERSION WITH DIGITAL INPUT

M1-L1 Exit Ticket: QUESTION ID 7.1.1 (new)

Complete M1-L1 Exit Ticket by the assigned due date.

Watch the video about Drew Brees as he aims for a target, and answer the following questions:

1. At the conclusion of the video, your classmate says, "Drew Brees aims better than an Olympic archer!" Is your classmate correct, and how do you know?

   A. Yes, the classmate is correct.
   B. No, the classmate is not correct.

2. After viewing the video, another NFL player tried to break Brees' record. This player hit the bullseye 5 out of 10 times. Based on the data, did the player break Brees' record, and how do you know?

   A. Yes, Brees' record was broken.
   B. No, Brees' record was not broken.

The other NFL player had a 100% Rate of the nearest toss.
Complete M1-L2 Exit Ticket by the assigned due date.

Brittany is making the orange juice for her breakfast party in her hometown class. She is using 4 cups of frozen juice concentrate to mix with 12 cups of water to make 24 servings of orange juice. Is the concentration of frozen juice concentrate to water proportional, and will it not be correct.

A. Yes, the second mixture is proportional, but it will not be correct.
B. No, the second mixture is not proportional, and it will not be correct.
C. Yes, the second mixture is not proportional, but it will be correct.
D. No, the second mixture is not proportional, but it will be correct.
**M1-L3 Exit Ticket: QUESTION ID 7.1.3 (new)**

The table below shows the price for a given number of pencils. Complete M1-L3 Exit Ticket by the assigned due date.

<table>
<thead>
<tr>
<th>Number of Pencils</th>
<th>Price (Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Is the price proportional to the number of pencils? How do you know?

- **A.** No, the price is not proportional to the number of pencils. The ratios of number of pencils to price are not equivalent.
- **B.** Yes, the price is proportional to the number of pencils. The ratios of number of pencils to price are equivalent.
- **C.** Yes, the price is proportional to the number of pencils. The ratios of number of pencils to price all simplify to $\frac{2}{5}$ per pencil.
- **D.** No, the price is not proportional to the number of pencils. The pencils are priced at different rates.

Find the cost of purchasing 24 pencils. Round to the nearest cent.
Complete M1-L4 Exit Ticket by the assigned due date.

This table shows the relationship between the side lengths of a regular hexagon and its perimeter.

<table>
<thead>
<tr>
<th>Side Lengths, s (inches)</th>
<th>Perimeter, P (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

Complete the table by filling in the missing values of the perimeter.

If Gabby wants to make a hexagon with a side length of 27 inches using wire, how much wire does she need?

☐

Is perimeter is proportional to the side length?
○ A. No, the perimeter is not proportional to the side length.
○ B. Yes, the perimeter is proportional to the side length.
Complete M1-L5 Exit Ticket by the assigned due date.

1. The table below gives the number of students working on their math homework and the corresponding number of hours they worked on their homework. Which graph matches the table of values?

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

- A. ![Graph A]
- B. ![Graph B]
- C. ![Graph C]

Does the graph represent two quantities that are proportional to each other? Explain why or why not.

- A. No, the graph is not proportional because it does not go through the origin.
- B. No, the graph is not proportional because it does not go through the origin and it is not a straight line.
- C. Yes, the graph is proportional because it is a straight line that goes through the origin.
- D. Yes, the graph is proportional because it is a straight line.

2. Fill in the table and given values to create quantities proportional to each other. Use other integers ranging from 1-20 as your x-values.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dylan and Kresha are buying donuts for everyone in their math class. Each person will get one donut. Dylan thinks that if you divide the cost of a dozen donuts by the number of students in their class, you will know the total cost of the donuts. Kresha thinks that if you multiply the price per donut by the number of students in their class, you will know the total cost of the donuts.

Why is this person right?

☐ A. Dylan
☐ B. Kresha

If you multiply the unit price, or price per donut, by the number of students getting a donut, you will know the total cost of the donuts.

If you divide the total cost of a dozen donuts by 12, you will know the total cost of the donuts.
Complete M1-L8 Exit Ticket by the assigned due date.

Tony and Stephanie cut grass during the summer to make extra money. The hours they work and the amount of money earned are given for each person.

**Tony's Money Earned**

<table>
<thead>
<tr>
<th>Hours Worked (h)</th>
<th>Money Earned ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
</tr>
<tr>
<td>9</td>
<td>144</td>
</tr>
</tbody>
</table>

**Stephanie's Money Earned**

a. Determine whether Tony's money earned is proportional to hours worked. If it is, determine the unit rate. If not, explain why not.

- **A.** Tony's money earned is proportional to hours worked. The unit rate is $\_\_\_\_\_\_\_ per hour.
- **B.** Tony's money earned is proportional to hours worked. There is no unit rate.

Click to select your answer(s).
Complete M1-L9 Exit Ticket by the assigned due date.

Tammy is a jambalaya cook in Louisiana for large company picnics. She uses a secret recipe that involves an equation. Tammy thinks the equation is correct. She used 2.4 pounds of chicken and 0.41 cups of rice. Which of the following equations is correct for finding the amount of rice used for 1 pound of chicken?

A. The equation is \(c = 0.41r\), and the rate 0.41 represents the cups of rice per pound of chicken.
B. The equation is \(c = 2.42\), and the rate 2.42 represents the pounds of chicken per cup of rice.
C. The equation is \(c = 2.42\), and the rate 2.42 represents the pounds of chicken per cup of rice.
D. The equation is \(c = 2.42\), and the rate 2.42 represents the cups of rice per pound of chicken.
Complete M1-L10 Exit Ticket by the assigned due date and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

The gym membership costs $127 per month. When this relationship is graphed, why does it include the points (0,0) and (1,127)? What do these points mean in the context of the problem?
Complete M1-L11 Exit Ticket by the assigned due date.

Which is the better buy? Explain your reasoning using the given values.

\[ 7 \frac{1}{3} \text{ lb. of potatoes for } \$11.37 \quad \quad \quad \quad \quad \quad 5 \frac{1}{5} \text{ lb. of potatoes for } \$6.08 \]

- A. \[ 5 \frac{1}{3} \text{ lb. of potatoes for } \$6.08 \] is the better buy.
- B. \[ 7 \frac{1}{3} \text{ lb. of potatoes for } \$11.37 \] is the better buy.

This was the better buy because it costs \( \square \) per pound, which is \( \square \) cheaper per pound compared to the other rate. (Round your answers to the nearest hundredth.)
Module 1: Exit Tickets and Assessments

Text:

Complete M1-L12 Exit Ticket by the assigned due date.

If 2 lb of Hawaiian Kona coffee cost $16.65, how much would 1 lb of Hawaiian Kona coffee cost?

One pound of Hawaiian Kona coffee costs $ x.
The table below shows the combination of floor cleaner to the amount of water used when diluting the cleaner. The cleaner says for every 3 quarts of water, you add 1 cup of cleaner. We know that 1 quart of water is equivalent to 4 cups. Use this information to complete the table below. Round any decimals to the nearest hundredth.

<table>
<thead>
<tr>
<th>Water (quarts)</th>
<th>Cleaner (cups)</th>
<th>Total (cups)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 3/6</td>
</tr>
</tbody>
</table>

Enter your answer in each of the answer boxes.
Complete M1-L14 Exit Ticket by the assigned due date.

1. Your favorite store advertised an item you want priced with a 4% discount. The item originally costs $57.42.

   a. What is the amount of the discount if the item you want originally costs $57.42?

   b. What is the discount percent of the bicycle?

   c. Explain how you found your solution to part b.

   o A. Subtract the original cost from the discount cost.

   o B. Subtract the discount cost from the discount percent.

   o C. Subtract the discount percent from the discount cost.

   o D. Subtract the discount cost times the discount percent.

2. What would the original price be if the item was marked down by \( \frac{1}{3} \) of the original price?

   a. If the discount price is $41.8, what was the original price?

   b. If the item was marked up by \( \frac{1}{5} \) before it was placed nilai by the store, what was the price that the store paid for the item?
Sasha is training for a marathon. She runs a certain number of miles each day.

1. Explain the relationship between the variables in the graph above.
   - A. Sasha runs 1 mile every 7 days.
   - B. Sasha runs 7 miles per day.
   - C. Sasha runs 7 miles total.
   - D. Sasha runs for 7 days total.

2. Complete the given coordinates below for the given relationship in the graph. Explain what these points mean in the context of the problem.
Complete M1-L16 Exit Ticket by the assigned due date.

Use the following figure on the graph for problems 1 and 2.

1. a. If the original lengths are multiplied by 4, which one of these are not a new coordinate?
   - A. (28, 56)
   - B. (0, 0)
   - C. (0, 28)
   - D. (28, 0)

   b. Use the table to answer lengths.
Complete M1-L17 Exit Ticket by the assigned due date.

Charlie's Bakery Shop that he is opening is 255 ft. x 799 ft. The blueprint of the building is a scale drawing with a scale factor of 1:50. Complete the table below to show the dimensions of the scale drawing. (Give your answers as simplified fractions or decimals rounded to the nearest hundredths.)

<table>
<thead>
<tr>
<th>Actual Dimensions (in feet)</th>
<th>Scale Drawing Dimensions (in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>255 ft.</td>
<td>5.11 in.</td>
</tr>
<tr>
<td>799 ft.</td>
<td>15.98 in.</td>
</tr>
</tbody>
</table>
Complete M1-L18 Exit Ticket by the assigned due date.

The image of a cruise ship is $\frac{2}{3}$ inches in a magazine. Find the actual length of the boat if $\frac{1}{2}$ inch length on the photo corresponds to $\frac{2}{3}$ foot of actual length.

The actual length of the boat is $\square$ feet. (Give your answer as a reduced improper fraction, mixed number, or decimal rounded to the nearest thousandth.)
Complete M1-L19 Exit Ticket by the assigned due date.

1. The layout of this backyard is drawn with a scale of 1 inch corresponding to every 16 feet of the actual backyard.

   - 1 ⅛ inches
   - ⅜ inches

2. a. Describe how scale or scale factor can be used to determine the area of the actual dining room.
   - Use the scale factor as a ratio in a proportion to convert the inches to feet.
   - Use the scale factor by multiplying the feet times the inches to convert the inches to feet.
   - Use the scale factor to find the actual area of the grassy area.
   
3. Find the actual area of the grassy area. (Round your answer to the nearest tenth of a foot.)
Complete M1-L20 Exit Ticket on a separate sheet of graph paper by the assigned due date.

1. Draw the layout of this bedroom floorplan on a separate sheet of graph paper. Keep all dimensions the same. Each square in the drawing is 1 in. Every 1 cm represents 2 ft. Using the appropriate scale, show where you would place the following items in your bedroom:

   - Queen Bed (60 in. by 80 in.)
   - Dresser (60 in. by 60 in.)
   - Chest of Drawers (30 in. by 30 in.)
   - Sofa (36 in. by 60 in.)
   - Nightstand (30 in. by 30 in.)
Alex is building a bench to sit on outside. His father drew the original scale drawing. Alex drew a different sized scale drawing of the bench in the layout he drew of the backyard. Use the information below to fill in the missing values in the table.

<table>
<thead>
<tr>
<th>Original Scale Drawing</th>
<th>Alex’s Scale Drawing</th>
<th>Scale Factor of Alex’s drawing to the actual bench</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 inches</td>
<td>6 inches</td>
<td>2</td>
</tr>
</tbody>
</table>

Complete M1-L22 Exit Ticket by the assigned due date.
1. Janiah helped her mother with the flower beds. They planted hydrangeas and tulips. Every year, these plants will die off during the winter, but then grow back during the spring. Each hydrangea plant started off with 5 flowers, and the tulips started off with 2. If they each blossom 4 more flowers a year when they grow back, will their growth rate be proportional? Complete the table and choose the best answer that explains whether or not they are proportional.

<table>
<thead>
<tr>
<th>Hydrangea Flowers</th>
<th>Tulip Flowers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- A. They are not proportional. The ratios between the flowers are not equivalent.
- B. They are proportional. The ratios between the flowers are not equivalent.
- C. They are proportional. The ratios between the flowers are equivalent.
- D. They are not proportional. The ratios between the flowers are equivalent.
2. According to the records, Branado’s Burgers kept last year, for every 9 cheeseburgers ordered, 3 regular burgers were ordered. Is the relationship between number of cheeseburgers proportional to the number of regular burgers? Choose the graph that correctly displays this relationship.
Complete M1-Mid-Module Assessment by the assigned due date.

3. Pizza sales at Buck’s Pizza Kitchen go towards paying employees and bills before the owners make any money, or revenue. The graph below shows how much revenue the Pizza Kitchen owners make according to the total amount of pizza sales.

![Graph showing Pizza Sales and Revenue relationship]

a. Identify the constant of proportionality between revenue and sales.
Complete M1-End-of-Module Assessment by the assigned due date.

1. If you do not turn the water off completely, and allow water to drip, you waste a lot of water and money. Determine the answer to the following questions based on a water drip at a rate of 2/5 of a gallon every 20 minutes.

   a. What is the rate at which the water is leaking? The water is leaking at a rate of \( \frac{2}{5} \) gallon per hour. (Round to the nearest thousandth.)

   b. Write an equation that represents the relationship between the number of buckets filled, \( y \), in \( x \) hours.

   c. How long will it take to fill a gallon? It will take \( 2x \) minutes to fill a gallon.
Complete M1-End-of-Module Assessment by the assigned due date.

2. A basketball court has a specific layout with specific dimensions. On this diagram, $\frac{1}{3}$ inch corresponds to 4 feet.

   ![Diagram of a basketball court]

   a. What is the scale factor of the photo?
   
   The scale factor of the photo is $\square$ inch(es) to $\square$ inch(es).

   b. If the dimensions of the layout above are 5 inches by 2 inches, what are the actual dimensions of the basketball court?
   
   The actual dimensions of the basketball court are $\square$ feet by $\square$ feet.

   c. If the area of the center circular area on the layout above is 16 in.$^2$, what is the area of the circle on the actual basketball court?

   Enter your answer in each of the answer boxes.
Complete M1-End-of-Module Assessment by the assigned due date.

3. Every year before school starts, most stores have “Back to School” sales. In one of the uniform stores, uniform tops and bottoms are being sold with a discount of \[ \frac{1}{3} \] off the original price. If you buy 2 uniform sets for a total of $160 with the discount, what would the original cost be?

The original cost would be $[ ] (Round to the nearest penny.)
Henry is making a garden to grow fresh vegetables and herbs in. The layout of the backyard is drawn with a scale of 2 inches of length corresponding to the actual length of 14 feet.

1. What is the scale factor?
2. The scale factor is ___.
3. If the dimensions of the garden on the layout are 10 inches by 15 inches, what are the actual dimensions in feet?
4. The actual dimensions in feet are ___, by ___.
5. How many bags of fertilizer does he need to buy to cover the entire garden? (Round your answer to the nearest whole number.)
M2-L1 Exit Ticket: QUESTION ID 7.2.1 (essay)

Complete M2-L1 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the picture to insert fractions, mathematical symbols, etc.

1. Your hand beats with the 7 cards. Find three different pairs that would complete your hand and result in a value of zero.

2. Write an equation to model the sum of the situation below.
   A hydrogen atom has a zero charge because it has one negatively charged electron and one positively charged proton.

3. Write an equation for each diagram. How are these equations alike? How are they different? What is it about the diagrams that lead to these similarities and differences?

Enter your answer in the form of an essay.
Jessica made the addition model below of the expression \((-3) + (-2) + 3\).

a. Do the arrows correctly represent the numbers that Jessica is using in her expression?

b. Jessica used the number line diagram above to conclude that the sum of the three numbers is 1. Is she correct?

c. If the answer is incorrect, find the sum, and explain how to draw the correct model.

d. Write a real-world situation that would represent the sum.
Complete M2-L3 Exit Ticket and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Refer to the diagram below.

   ![Diagram]

   a. Write an equation for the diagram.
   b. Find the sum.
   c. Describe the sum in terms of the distance from the p-value. Explain.
1. Write an addition problem that has a sum of $-\frac{3}{5}$ and $\frac{2}{3}$. Both addends (p-value and q-value) have the same sign.

2. In the Integer Game, what card would you need to draw to get a score of 0 if you have a $-16$, $-35$, and $18$ in your hand?
Complete M2-L5 Exit Ticket and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. If a player had the following cards, what is the value of his hand?

   1  -7  4

   a. Identify two different ways the player could get to a score of 5 by adding or removing only one card. Explain.
   b. Write two equations for part (a), one for each of the methods you came up with for arriving at a score of 5.

2. Using the rule of subtraction, rewrite the following subtraction sentences as addition sentences and find the sums.
   a. 5-9
   b. -14(-2)

Enter your answer in the form of an essay.
Two 7th grade students, Monique and Matt, both solved the following math problem:

If the temperature drops from 7°F to -1°F, by how much did the temperature decrease?

The students came up with different answers. Monique said the answer is 24°F, and Matt said the answer is 10°F. Who is correct? Explain, and support your written response with the use of a formula and a vertical number line diagram.
M2-L7 Exit Ticket: QUESTION ID 7.2.7 (essay)

Complete M2-L7 Exit Ticket and we will discuss solutions in class. Number the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

At the beginning of the summer, the water level of a pond is 2 feet below its normal level. After an unusually dry summer, the water level of the pond dropped another 1\frac{1}{2} feet.

1. Explain how to use a number line diagram to model the pond's current water level in relation to its normal water level.

2. Write an equation to show how far above or below the normal water level the pond is at the end of the summer.

Enter your answer in the form of an essay.
Complete M2-L8 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

Mariah and Shake both started to work on a math problem and were comparing their work in math class. Are both of their representations correct? Explain, and finish the math problem correctly to arrive at the correct answer.

Mariah started the problem as follows:

\[-\frac{5}{2} - \left( -\frac{1}{4} \right)\]

Shake started the problem as follows:

\[-\frac{5}{2} + \left( \frac{3}{4} \right)\]

Which rational number represents the overall change to the amount of money Jazzy's friend had?
Complete M2-L9 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Jamie was working on his math homework with his friend Kent. Jamie looked at the following problem:

\[-9.5 - (-8) - 6.5\]

He told his friend Kent that he did not know how to subtract negative numbers. Kent said that he knew how to solve the problem using only addition. What did Kent mean by that? Explain. Then, show your work and represent the answer as a single rational number.

2. Use one rational number to represent the following expression. Show your work.

3 + \((-0.2) - 15\frac{1}{4}\)
Complete M2-L10 Exit Ticket and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Natalie is playing the Integer Game and only shows you the four cards shown below. She tells you that the rest of her cards have the same values on them and match one of these four cards.

   2  3  -6  4

   a. If all of the matching cards will increase her score by 18, what are the matching cards?
   b. If all of the matching cards will decrease her score by 12, what are the matching cards?

2. A hand of six integer cards has one matching set of two or more cards. If the matching set of cards is removed from the hand, the score of the hand will increase by six. What are the possible values of these matching cards? Explain. Write an equation using multiplication showing how the matching cards yield an increase in score of six.

Enter your answer in the form of an essay.
1. Create a real-life example that can be modeled by the expression \(-2\times4\), and then state the product.

2. Two integers are multiplied, and their product is a positive number. What must be true about the two integers?
Complete M2-L12 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Mrs. McIntire, a seventh grade math teacher, is grading papers. Three students gave the following responses to the same math problem:
   
   Student one: \( \frac{1}{2} \)
   
   Student two: \( -\frac{1}{2} \)
   
   Student three: \( -\frac{1}{2} \)
   
   On Mrs. McIntire’s answer key for the assignment, the correct answer is: -0.5. Which student answer(s) is/are correct? Explain.

2. Explain how to complete the table below. Provide an answer for each integer division problem and write a related equation using integer multiplication.

<table>
<thead>
<tr>
<th>Integer Division Problem</th>
<th>Related Equation Using Integer Multiplication</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-36 \div (-9) = _____)</td>
<td></td>
</tr>
<tr>
<td>(24 \div (-8) = _____)</td>
<td></td>
</tr>
<tr>
<td>(-50 \div 10 = _____)</td>
<td></td>
</tr>
</tbody>
</table>
Exit Ticket: QUESTION ID 7.2.13 (essay)

Complete M2-L13 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the palette to insert fractions.

1. Write 3.0035 as a fraction. Explain your process.

2. This week is just one of 40 weeks that you spend in the classroom this school year. Convert the fraction to decimal form.
1. What is the decimal value of $\frac{4}{11}$?

2. How do you know that $\frac{4}{11}$ is a repeating decimal?

3. What causes a repeating decimal in the long division algorithm?
Complete M2-L15 Exit Ticket and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Harrison made up a game for his math project. It is similar to the Integer Game; however, in addition to integers, there are cards that contain other rational numbers such as -0.5 and -0.25.

   a. Harrison discards three -0.25 cards from his hand. How does this affect the overall point value of his hand? Write an equation to model this situation.

   b. Ezra and Benji are playing the game with Harrison. After Ezra doubles his hand’s value, he has a total of -14.5 points. What was his hand’s value before he doubled it?

   c. Benji has four -0.5 cards. What is his total score?
1. Evaluate the expression below using the properties of operations.

\[
18 - \frac{2}{3} \times 4 - (7 - 3) + \frac{2}{4}
\]

2. Given the expression below, what will be the sign of the product? If it is positive, justify your answer:

\[-4 \times \left(\frac{2}{3}\right) \times (2.78) \times \left(\frac{1}{3}\right) \times \left(\frac{1}{11}\right) \times A\]

b. Give a value for A that would result in a positive value for the expression.

c. Give a value for A that would result in a negative value for the expression.
1. Eric's schedule is the same for each week, with two part-time jobs. Each job is the same length, and he works the same amount of time in each. Each job takes 40 hours per week. If he works 5 days a week, how many hours does he work each weekend?

2. Harry is making a bookcase and has a total of 16 ft. of lumber. The top, bottom, and two shelves are all the same height. How long is each shelf?
Bradley and Louis are roommates at college. At the beginning of the semester, they each paid a security deposit of $400 dollars. When they move out, their landlord will deduct from this deposit any expenses 3 for excessive wear and tear, and refund the remaining amount. Bradley and Louis will share the expenses equally.

- Write an expression that describes the amount each roommate will receive from the landlord when he leaves campus.
- Evaluate the expression using the following information: Each roommate paid a $125 deposit, and the landlord deducted $50 total for damages.
Complete M2-L19 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

1. Write three equivalent expressions that can be used to find the final price of an item that costs \( g \) dollars and is on sale for 15% off, and charged 7% sales tax.

Using the expressions determine the final price for an item that costs $75.

If each expression yields the same final sale price, is there anything to be gained by using one over the other?

Describe the benefits/special characteristics/properties of each expression.

Enter your answer in the form of an essay.
Complete M2-L20 Exit Ticket and we will discuss various answers in class. Number the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

Using the incomplete register below, work forward and backward to determine the beginning and ending balances after the series of transactions listed.

<table>
<thead>
<tr>
<th>DATE</th>
<th>DESCRIPTION OF TRANSACTION</th>
<th>PAYMENT</th>
<th>DEPOSIT</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning Balance</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>1/31/12</td>
<td>Paycheck</td>
<td></td>
<td>350.55</td>
<td></td>
</tr>
<tr>
<td>2/1/12</td>
<td>Gillian’s Chocolate Factory (Candy)</td>
<td>32.40</td>
<td></td>
<td>685.26</td>
</tr>
<tr>
<td>2/4/12</td>
<td>Main Street Jeweler’s</td>
<td>425.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/14/12</td>
<td>Saratoga Steakhouse</td>
<td>125.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Write an expression to represent the balance after the paycheck was deposited on 1/31/12. Let x represent the beginning balance.

2. Write a numerical expression to represent the balance after the transaction for Main Street Jeweler’s was made.
Complete M2-L21 Exit Ticket and we will discuss various answers in class. Letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

**Question ID 7.2.21 (essay)**

**Text:**

Compare the two expressions:

Expression 1: \( 6 + 7 + 5 \)

Expression 2: \( 5 + 10 + 3 \)

a. Are the two expressions equivalent? How do you know?

b. Subtract -5 from each expression. Write the new numerical expression, and write a conclusion as an if-then statement.

c. Add 4 to each expression. Write the new numerical expression, and write a conclusion as an if-then statement.

d. Divide each expression by 2. Write the new numerical expression, and write a conclusion as an if-then statement.

Enter your answer in the form of an essay.
Complete M2-L22 Exit Ticket and we will discuss various answers in class. Use the palette to insert fractions, mathematical symbols, etc.

Susan and Bonnie are shopping for school clothes. Susan has $50 and a coupon for a $10 discount at a clothing store where each shirt costs $12.

Susan thinks that she can buy 3 shirts, but Bonnie says that Susan can buy 5 shirts. The equations they used to model the problem are listed below. Solve each equation algebraically, explain and justify your steps, and determine who is correct and why.

Susan’s Equation: 
$$12n + 10 = 50$$

Bonnie’s Equation: 
$$12n - 10 = 50$$

Enter your answer in the form of an essay.
Andrew’s math teacher entered the 7th grade students in a math competition. There was an enrollment fee of $30 and also in $11 charge for each packet of 10 tests. The total cost was $141. How many tests were purchased?

Set up an equation to model this situation, solve it using algebraic statements, and justify the reasoning for each step in your solution.
Complete M2-Mid-Module Assessment and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. Diamond used a number line to add. She started counting at 10, and then she counted until she was on the number -4 on the number line.
   a. If Diamond is modeling addition, what number did she add to 10? Explain how to use the number line below to model your answer.

   ![Number Line]

   b. Write a real-world story problem that would fit this situation.
   c. Use absolute value to express the distance between 10 and -4.

2. What value of $a$ will make the equation a true statement? Explain how you arrived at your solution.
   
   \[
   \left(-\frac{3}{4} - \frac{1}{3}\right) + a = 0
   \]

3. Every month, Ms. Thomas pays her car loan through automatic payments (withdrawals) from her savings account. She pays the same amount on her car loan each month. At the end of the year, her savings account balance changed by -$2,931 from payments made on her car loan.
   a. What is the change in Ms. Thomas’ savings account balance each month due to her car payment?
   b. Describe the total change to Ms. Thomas’ savings account balance after making six monthly payments on her car loan. Model your answer using a number...
Complete M2-End-of-Module Assessment and we will discuss various answers in class. Number and letter the answers to the questions. Use the palette to insert fractions, mathematical symbols, etc.

1. The water level in Rocky Lake changes at an average of $\frac{7}{10}$ inch every 3 years.
   a. Based on the rate above, how much will the water level change after one year? Show your calculations and explain how to model your answer on the vertical number line, using 0 as the original water level.
   
   ![Diagram of vertical number line with original water level marked at 0 and change in water level marked as $\frac{7}{10}$ inch after 3 years.]

   
   b. How much would the water level change over a 7-year period?
   c. When written in decimal form, is your answer to part (b) a repeating decimal or a terminating decimal? Justify your answer using long division.

2. Kay’s mother taught her how to make handmade ornaments to sell at a craft fair. Kay rented a table at the fair for $30 and set up her workstation. Each ornament that she makes costs approximately $2.50 for materials. She sells each ornament for $6.00.
   a. If $x$ represents the quantity of ornaments sold at the craft fair, which of the following expressions would represent Kay’s profit? (Give all choices that apply.)
   
   Enter your answer in the form of an essay.
### SECTION 2.2: COPIED VERSION WITH PAPER

**M2-L1 Exit Ticket: QUESTION ID 7.2.1 (paper)**

1. Your hand starts with the 7 cards. Find three different pairs that would complete your hand and result in a value of zero.

2. Write an equation to model the sum of the situation below. A Hydrogen atom has a zero charge because it has one negatively charged electron and one positively charged proton.

3. Write an equation for each diagram. How are these equations alike? How are they different? What is it about the diagrams that lead to these similarities and differences?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Jessica used the number line diagram above to conclude that the sum of the three numbers is 1. Is she correct?

If she is incorrect, find the sum, and draw the correct model.

1. Do the arrows correctly represent the numbers that Jessica is using in her expression?

Write a real-world situation that would represent the sum.
Complete M2-L3 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Text: Module 2: Exit Tickets and Assessments

1. Refer to the diagram below.

   a. Write an equation for the diagram.
   b. Find the sum.
   c. Describe the sum in terms of the distance from the p-value. Explain.
   d. What integers do the arrows represent?
Complete Module 2.4 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Write an addition problem that has a sum of $\frac{3}{5}$ and
   a. Both addends (p-value and q-value) have the same sign.
   b. The two addends (p-value and q-value) have different signs.

2. In the Integer Game, what card would you need to draw to get a score of 0 if you have a -16, -35 and 18 in your hand?
1. If a player had the following cards, what is the value of his hand?

\[1 - 7 4\]

a. Identify two different ways the player could get to a score of 5 by adding or removing only one card. Explain.
b. Write two equations for part (a), one for each of the methods you came up with for arriving at a score of 5.

2. Using the rule of subtraction, rewrite the following subtraction sentences as addition sentences and find the sums.

a. 5 - 9
b. -14 - (-2)
Two 7th grade students, Monique and Matt, both solved the following math problem: 

The temperature drops 7°F to 17°F. By how much did the temperature decrease?

The students came up with different answers. Monique said the answer is 24°F, and Matt said the answer is 10°F.

Who is correct? Explain, and support your written response with the use of a formula and a vertical number line diagram.
Complete M2-L7 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

At the beginning of the summer, the water level of a pond is 2 feet below its normal level. After an unusually dry summer, the water level of the pond dropped another \( \frac{1}{3} \) feet.

1. Use a number line diagram to model the pond’s current water level in relation to its normal water level.

2. Write an equation to show how far above or below the normal water level the pond is at the end of the summer.
Complete M2-L8 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Mariah and Shane both started to work on a math problem and were comparing their work in math class. Are both of their representations correct? Explain, and finish the math problem correctly to arrive at the correct answer.

Math Problem

Jessica's friend lent her $5. Later that day Jessica gave her friend back $1 \frac{3}{4} dollars.

Which rational number represents the overall change to the amount of money Jessica's friend has?

Mariah started the problem as follows:  
\[ -5 - (-1 \frac{3}{4}) \]
\[ = -5 + 1 - \frac{3}{4} \]

Shane started the problem as follows:  
\[ -5 - (-1 \frac{3}{4}) \]
\[ = -5 + 1 + \frac{3}{4} \]
Complete M2-L9 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Jamie was working on his math homework with his friend Kent. Jamie looked at the following problem:
   \[-9.5 \div (\color{red}5) = \quad 0.6\]
   It told his friend Kent that he did not know how to subtract negative numbers. Kent said that he knew how to solve the problem using only addition. What did Kent mean by that? Explain. Then, show your work and represent the answer as a single rational number.

2. Use one rational number to represent the following expression. Show your work.
   \[3 + \left(-\frac{0.2}{15}\right)\]
Exit Ticket: QUESTION ID 7.2.10 (paper)

Complete M2-L10 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Natalie is playing the Integer Game and only shows you the four cards shown below. She tells you that the rest of her cards have the same values on them and match one of these four cards.

   \[ \begin{array}{c}
   2 \\
   3 \\
   -6 \\
   4 
   \end{array} \]

   a. If all of the matching cards will increase her score by 18, what are the matching cards?

   b. If all of the matching cards will decrease her score by 12, what are the matching cards?

2. A hand of six integer cards has one matching set of two or more cards. If the matching set of cards is removed from the hand, the score of the hand will increase by six. What are the possible values of these matching cards? Explain. Write an equation using multiplication showing how the matching cards yield an increase in score of six.
Complete M2.1.11 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Create a real-life example that can be modeled by the expression \(-2 \times -4\), and then state the product.

2. Two integers are multiplied, and their product is a positive number. What must be true about the two integers?
Complete M2-L12 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Mrs. McIntire, a seventh grade math teacher, is grading papers. Three students gave the following responses to the same math problem:

   Student one: \(-\frac{1}{2}\)
   
   Student two: \(\frac{1}{2}\)
   
   Student three: \(-\frac{1}{2}\)

   On Mrs. McIntire’s answer key for the assignment, the correct answer is: -0.5. Which student(s) is/are correct? Explain.

2. Complete the table below. Provide an answer for each integer division problem and write a related equation using integer multiplication.

<table>
<thead>
<tr>
<th>Integer Division Problem</th>
<th>Related Equation Using Integer Multiplication</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-36 \div (-9) =$ _______</td>
<td></td>
</tr>
<tr>
<td>$24 \div (-8) =$ _______</td>
<td></td>
</tr>
<tr>
<td>$-50 \div 10 =$ _______</td>
<td></td>
</tr>
</tbody>
</table>
Module 2 Exit Tickets and Assessments

Complete M2-L13 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Write 3.0035 as a fraction. Explain your process.

2. This week is just one of 40 weeks that you spend in the classroom this school year. Convert the fraction to decimal form.
Exit Ticket:

QUESTION ID 7.2.14 (paper)

Complete M2-L14 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. What is the decimal value of \( \frac{4}{11} \)?

2. How do you know that \( \frac{4}{11} \) is a repeating decimal?

3. What causes a repeating decimal in the long division algorithm?
1. Harrison made up a game for his math project. It is similar to the Integer Game; however, in addition to integers, there are cards that contain other rational numbers such as $0.5$ and $-0.5$.

   a. Harrison discards three $-0.5$ cards from his hand. How does this affect the overall point value of his hand? Write an equation to model this situation.

   b. Era and Beiji are playing the game with Harrison. After Era doubles his hand’s value, he has a total of $14.5$ points. What was his hand’s value before he doubled it?

2. Beiji has four $-0.5$ cards. What is his total score?
Complete M2-L16 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Evaluate the expression below using the properties of operations.
   \[ 18 \times \left( \frac{2}{3} \right) \times \left( \frac{3}{5} \right) \times \left( \frac{1}{4} \right) \]

2. a. Given the expression below, what will the sign of the product be? Justify your answer.
   \[ -4 \times \left( -\frac{5}{9} \right) \times \left( -\frac{1}{3} \right) \times \left( -\frac{11}{13} \right) \times A \]
   b. Give a value for A that would result in a positive value for the expression.
   c. Give a value for A that would result in a negative value for the expression.
Complete M2-L17 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Ernie's fisher works two part-time jobs. One is in the morning and one in the afternoon. His schedule is the same each day, and he works 3 hr. each morning. How many hours does Ernie's fisher work each afternoon?

2. Henry is making a bookcase that is 4 ft. high. The top, bottom, and two shelves are all the same length. How long is each shelf?
Complete M2-L18 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Bradley and Louie are roommates at college. At the beginning of the semester, they each paid a security deposit of $A$ dollars. When they move out, their landlord will deduct from this deposit any expenses $B$ for excessive wear and tear, and refund the remaining amount. Bradley and Louie will share the expenses equally.

- Write an expression that describes the amount each roommate will receive from the landlord when his lease expires.
- Evaluate the expression using the following information: Each roommate paid a $125$ deposit, and the landlord deducted $50$ total for damages.
Complete M2-L19 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. Write three equivalent expressions that can be used to find the final price of an item that costs $g$ dollars and is on sale for 15% off, and charged 7% sales tax.

Using the expression determining the final price for an item that costs $75, if each expression yields the same final sale price, is there anything to be gained by using one over the other?

Describe the beneficial characteristics/properties of each expression.
Complete M2-L20 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Using the incomplete register below, work forward and backward to determine the beginning and ending balances after the series of transactions listed.

<table>
<thead>
<tr>
<th>DATE</th>
<th>DESCRIPTION OF TRANSACTION</th>
<th>PAYMENT</th>
<th>DEPOSIT</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/31/12</td>
<td>Beginning Balance</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>1/31/12</td>
<td>Paycheck</td>
<td></td>
<td>350.55</td>
<td></td>
</tr>
<tr>
<td>2/1/12</td>
<td>Gillian’s Chocolate Factory (Candy)</td>
<td>32.40</td>
<td></td>
<td>685.26</td>
</tr>
<tr>
<td>2/4/12</td>
<td>Main Street Jeweler’s</td>
<td>425.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/14/12</td>
<td>Saratoga Steakhouse</td>
<td>125.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Write an expression to represent the balance after the paycheck was deposited on 1/31/12. Let \( x \) represent the beginning balance.

2. Write a numerical expression to represent the balance after the transaction for Main Street Jeweler’s was made.
Complete M2-L21 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Compare the two expressions:

Expression 1: $6 + 7 - 5$
Expression 2: $-5 + 10 + 3$

a. Are the two expressions equivalent? How do you know?
b. Subtract -5 from each expression. Write the new numerical expression, and write a conclusion as an if-then statement.
c. Add 4 to each expression. Write the new numerical expression, and write a conclusion as an if-then statement.
d. Divide each expression by -2. Write the new numerical expression, and write a conclusion as an if-then statement.
Susan and Bonnie are shopping for school clothes. Susan has $50 and a coupon for a $10 discount at a clothing store where each shirt costs $12.

Susan thinks that she can buy 3 shirts, but Bonnie says that Susan can buy 5 shirts. The equations they used to model the problem are listed below. Solve each equation algebraically, justify your steps, and determine who is correct and why.

Susan’s Equation: 
\[12n = 50\]

Bonnie’s Equation: 
\[12n = 10 + 40\]
Andrew's math teacher entered the 7th grade students in a math competition. There was an enrollment fee of $30 and also an $11 charge for each packet of 10 tests. The total cost was $51. How many tests were purchased?

Set up an equation to model this situation, solve it using algebraic statements, and justify the reasons for each step in your solution.
Complete M2-Mid-Module Assessment on loose-leaf paper and turn it in by the assigned due date.

1. Diamond used a number line to add. She started counting at 10, and then she counted until she was on the number -4 on the number line.
   a. If Diamond is modeling addition, what number did she add to 10? Use the number line below to model your answer.

   ![Number line diagram]

   b. Write a real-world story problem that would fit this situation.

   c. Use absolute value to express the distance between 10 and -4.

2. What value of \( a \) will make the equation a true statement? Explain how you arrived at your solution.

   \[
   \left( -\frac{3}{4} + \frac{4}{3} \right) + a = 0
   \]

3. Every month, Ms. Thomas pays her car loan through automatic payments (withdrawals) from her savings account. She pays the same amount on her car loan each month. At the end of the year, her savings account balance changed by -$2,931 from payments made on her car loan.
   a. What is the change in Ms. Thomas’ savings account balance each month due to her car payment?

   b. Describe the total change to Ms. Thomas’ savings account balance after making six monthly payments on her car loan. Model your answer using a number sentence.

Click to select your answer(s).
1. The water level in Kacky Lake changes at an average of $\frac{7}{10}$ inch every 3 years.
   a. Based on the rate above, how much will the water level change after one year? Show your calculations and model your answer on the vertical number line, using 0 as the original water level.
   
   ![Original Water Level](image)
   
   b. How much would the water level change over a 7-year period?
   c. When written in decimal form, is your answer to part (b) a repeating decimal or a terminating decimal? Justify your answer using long division.

2. Kay’s mother taught her how to make handmade ornaments to sell at a craft fair. Kay rented a table at the fair for $30 and set up her work station. Each ornament that she makes costs approximately $2.50 for materials. She sells each ornament for $6.00.
   a. If \( x \) represents the quantity of ornaments sold at the craft fair, which of the following expressions would represent Kay’s profit? (Circle all choices that apply.)
Complete M2-L1 Exit Ticket by the assigned due date.

1. A football game starts with three plays, each gaining 8 yards. What are 6 more plays that would result in an overall gain of zero yards?

   □ A. -24, -8, -6, -2, 2.5
   □ B. -16, -8, -6, -2, 1.5
   □ C. -24, -8, -6, -2, 1.5
   □ D. -16, -8, -6, -2, 2.5

2. Write an equation to model the team’s total gain of 0 yards.
   A football player gains 1 yard but is penalized by losing one yard after running a play and gaining one yard.
   □ A. (1 + 1) + (-1) = 0
   □ B. (1 - 1) + 1 = 0

3. Write an equation for each diagram using the same numbers in each equation.
1. John made the addition model below with the expression \((-4) + (\cdot + 1) + 2\).

a. Do the arrows correctly represent John's expression?
   - \(\text{A. Yes, the arrows correctly represent John's expression.}\)
   - \(\text{B. No, the arrows do not correctly represent John's expression.}\)

b. John used the number line diagram above to conclude that the sum of the three numbers is 1. Is he correct?
   - \(\text{A. No, John is not correct.}\)
   - \(\text{B. Yes, John is correct.}\)

c. If he is incorrect, what is the correct sum?
Complete M2-L3 Exit Ticket by the assigned due date.

1. Refer to the diagram below.

Write an equation for the diagram including the sum.

Describe the sum in terms of the distance from the first value in your equation.

The sum is units below because the length from and .

What integers do the arrows represent? Enter your answer in both of the answer boxes.

Complete M2-L4 Exit Ticket by the assigned due date.

1. Complete the equation below. In the Integer Game, what card would you need to draw to get a score of 0 if you have a 16, -35, and 18 in your hand?

\[-16 + \_7 - 13 + 1 = 0\]

Turn in separately on paper by the assigned due date:

2. Write an equation that has a sum of \(\frac{3}{5}\) and
   a. Both addends have the same sign.
   b. The two addends have different signs.
Complete M2-L5 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

1. If someone has the following money exchanges, what is their ending balance?

   a. Identify how a person would get an ending balance of $8 by adding one dollar amount.

   b. Write the equation for part (a), including all four numbers that were used to arrive at a balance of $8.

2. Using the rule of subtraction, rewrite the following subtraction sentences as addition sentences and find the sums.

   a. $5 - 6

   b. $14 - (m-3)
Complete M2-L6 Exit Ticket by the assigned due date.

You are figuring out the answer to this question while in math class.

If a person goes from 8 feet above sea level to 15 feet below sea level, how much did their elevation decrease?

Which answer is the correct answer?

A. 23
B. 7
C. −15 − 8
D. −15 + 8

Turn in separately on paper by the assigned due date. On a separate sheet of paper, draw a number line diagram to support the formula you chose above. Include an explanation of your number line diagram.
Complete M2-L7 Exit Ticket by the assigned due date.

Lake Lanier supplies water to a town close to Atlanta. During a drought, the level of the lake was 3 feet below the normal level. After three more weeks of no rain, the water level of the lake dropped another 2 feet.

1. Write an equation to show how far above or below the normal water level the lake after three more weeks of no rain. (Use integers or mixed numbers.)

2. On a separate sheet of paper, draw a number line diagram to model the lake’s change in water level.
Charles removed $7$ from his piggy bank. Later that day, he put $1\frac{3}{4}$ back into his piggy bank. What rational number represents the overall change in the amount of money in the piggy bank?

You solved the problem as follows:

\[-7 + 1\frac{3}{4} = -7 + \frac{7}{4} = -\frac{28}{4} + \frac{7}{4} = -\frac{21}{4} \]

Your friend solved the problem as follows:

\[-7 - (-1\frac{3}{4}) = -7 + \frac{7}{4} = -\frac{28}{4} + \frac{7}{4} = -\frac{21}{4} \]

Are both of these methods correct?

\(- A. Yes, they are both correct.\)
\(- B. No, they are neither correct.\)
\(- C. No, they are both correct.\)
\(- D. Yes, your friend has the correct method.\)
Complete M2-L9 Exit Ticket by the assigned due date.

1. Instead of subtracting negative numbers, how could you solve the problem below using only addition? Give the answer to the problem as a single rational number.

\[-7.1 - (-6) - 3.5\]

Which option correctly shows the problem being solved using only addition?

- A. \[-7.1 + -6 + -3.5\]
- B. \[7.1 + -6 + 3.5\]
- C. \[7.1 + 6 + 3.5\]
- D. \[-7.1 + 6 + -3.5\]

The answer to the problem is [ ].

2. Give the answer to the following problem as a single rational number.

\[4 + (-0.7) - \frac{1}{2}\]
M2-L10 Exit Ticket: QUESTION ID 7.2.10 (new)

Complete M2-L10 Exit Ticket by the assigned due date.

1. During a football game, the team gains and loses yards as shown in the picture. The next series of plays have the same amount of yards each, and matches the amount of yards from one of the plays already made. The amount of yards for each play must have been yards.

   - If the next series of plays will decrease the total yards by 12, and each play equals the amount of one of the plays already made, what must have been the amount of yards for each play?

   - If the next series of plays will increase the total yards by 24, and each play equals the amount of one of the plays already made, what must have been the amount of yards for each play?

   Enter your answer in each of the answer boxes.
Complete M2-L11 Exit Ticket by the assigned due date.

1. Which real-life example could model the expression: 3 x 27?
   - A. Sammy splits $2 to 5 people.
   - B. Sammy owes 2 payments of $S each.
   - C. Sammy owes a total payment of $S to 2 people.

   The product is: [ ]

2. Two integers are multiplied, and their product is a positive number. What must be true about the two integers?
   - A. The two integers must both be negative.
   - B. The two integers must both be positive.
   - C. The two integers must have different signs.
   - D. The two integers must have the same sign.
Exit Ticket: QUESTION ID 7.2.12 (new)

1. On a quiz, the correct answer to a problem is 0.25 rounded to the nearest hundredth. Here are three student responses to this math problem:

   Student one: –\( \frac{1}{4} \)
   Student two: –\( \frac{1}{4} \)
   Student three: –\( \frac{1}{4} \)

Which student answer(s) if any are correct?

A. Student two and three are correct.
B. All three students are correct.
C. Student two is correct.
D. None of the students are correct.

2. Complete the problems below. Provide an answer for each integer division problem and pick the related equation that is using integer multiplication.

\(-28 \div -7 = \)
Complete M2-L13 Exit Ticket by the assigned due date.

1. What is 5/2 as a fraction? (Give your answer as a fraction.)
   
2. This week number was out of 40 total weeks in the classroom for this school year. Convert the fraction $\frac{2}{40}$ to decimal form. (Round to the nearest thousandth.)
Complete M2-L14 Exit Ticket by the assigned due date.

1. What is the decimal value of $\frac{4}{11}$? (Round to the nearest thousandths.)

2. How do you know that $\frac{4}{11}$ is a repeating decimal?
   - A. The denominator is 11.
   - B. It is not repeating. It is a terminating decimal.
   - C. It is not repeating. It is an irrational number.
   - D. The numerator is 4.

3. What causes a repeating decimal in the long division algorithm?
   - A. The remainder repeats, and this does not cause a pattern.
   - B. The remainder repeats, and this does cause a pattern.
   - C. The remainder does not repeat, and this does not cause a pattern.
   - D. The remainder does not repeat, and this does cause a pattern.
Complete M2-L15 Exit Ticket by the assigned due date.

Give the solutions to the following questions.

1. Trevor gets rid of 0.28 cards from his hand. How does this affect the overall point value of his hand?
   - option A. 3 \times -0.28
   - option B. 3 \times 0.28
   - option C. 3 \times \sqrt{0.28}
   - option D. 3 \times 0.28

2. Trevor doubles his total money value to have a total of 10.5. What was his total value before it was doubled?
   - option A. 5.25
   - option B. 10.5
   - option C. 0.525
   - option D. 5.25

Explain your reasoning for each question.
Complete M2-L16 Exit Ticket by the assigned due date.

1. Give the solution to the expression below.
\[ 16 \times \left( -\frac{1}{2} \right) \times 5 \times (-6) \times (-2) \times \left( \frac{1}{3} \right) \]

The solution is ___. (Give your answer as an improper fraction, mixed number, or decimal rounded to the nearest ten thousandth.)

2. a. Given the expression below, what will the sign of the product be? Justify your answer.
\[ -7 \times \left( -\frac{2}{5} \right) \times 6.58 \times \left( -\frac{1}{5} \right) \times (-6.1) \times (-0.1762) \times \left( \frac{1}{7} \right) \times Z \]

The sign of this product will be:
- A. Negative
- B. Positive

b. Which value for Z would result in a positive value for the expression?
- A. -6
- B. |-16|
- C. 5
- D. 0
1. Your summer job is irrigating over the summer. It allows you to work a total of 360 hours in a 4-day work week. If you work 6 hours each morning, how many hours do you work each afternoon?

You work a total of ______ hours each afternoon.

2. Jane is building a vegetable and flower garden and has a total of 6 yards of fencing. The left and right sides of the garden are each 6 yards long. The pieces in the center, the top, bottom, and two middle equal squares are all the same length. How long is each center piece between the 6-yard long side?
Complete M2-L18 Exit Ticket by the assigned due date.

Two families are going on vacation together. They rent a condominium in Florida and they each pay a security deposit of $S$ dollars. After their vacation, the condominium owner will deduct any expenses $E$ for any damaged or missing items and then refund the remaining amount. The families will split the amount charged for any damage expenses.

What is the expression that describes the amount each family will be refunded after their vacation?

A. $\frac{S - E}{2}$

B. $S - E$

C. $\frac{S - E}{2}$

D. $\frac{S - E}{2}$

How much money will each family get refunded if they each paid a $100 security deposit, and the condominium owner charged $31$ total for damages?

Each family will get $\_\_\_$ refunded.
1. Which one of the following expressions could be used to find the final price of an item that costs $x dollars and is on sale for 17%, off, and charged 8% sales tax?

A. $0.83x
B. $0.83x - 0.17x
C. $(0.88x) + (0.17x)$
D. $(0.88x) + 0.08x$(Rounded to the nearest cent)
Complete M2-L20 Exit Ticket on loose-leaf paper and turn it in by the assigned due date.

Using the incomplete register below, work forward and backward to determine the beginning and ending balances after the series of transactions listed.

<table>
<thead>
<tr>
<th>DATE</th>
<th>DESCRIPTION OF TRANSACTION</th>
<th>PAYMENT</th>
<th>DEPOSIT</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning Balance</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>2/21/14</td>
<td>Paycheck</td>
<td></td>
<td>331.18</td>
<td></td>
</tr>
<tr>
<td>2/24/14</td>
<td>Crazy Candies and Chocolates</td>
<td>32.68</td>
<td></td>
<td>735.68</td>
</tr>
<tr>
<td>3/4/14</td>
<td>Jared's Jewelry</td>
<td>497.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/14/14</td>
<td>Southern Steak Restaurant</td>
<td>96.86</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Which one of the following would be the correct expression to represent the balance after the paycheck was deposited on 2/21/14 if \( x \) represents the beginning balance?
   - A. 331.18 \(-\) \( x \)
   - B. \( x \) \(-\) 331.18
   - C. \( x \) \(+\) 735.68
   - D. \( x \) \(+\) 331.18

2. Which one of the following would be the correct expression to represent the balance after the transaction for Jared's Jewelry occurred?
   - A. 497.57 \(-\) 735.68
   - B. 735.68 \(-\) 497.57
   - C. 497.57 \(+\) 735.68
   - D. 735.68 \(+\) 497.57
Complete M2-L21 Exit Ticket by the assigned due date.

Expression 1: \(5 + 8 + 3\)

Expression 2: \(-6 + 1 + 5\)

a. Are the two expressions equivalent? How do you know?
- A. Yes, they give the same sum.
- B. No, they do not give the same sum.
- C. Yes, they do not give the same sum.

b. Subtract 7 from each expression. What is the new sum?

The new sum is [ ].

c. Add 5 to each expression. What is the new sum?

The new sum is [ ].
Sarah has $250 in her yearly budget to pay for a gym membership. The fitness gym near her house charges $40 annual fee and $40 per month. Sarah is not sure if she is able to buy 5.25 or 7.25 months of membership based on the amounts charged. The equations below model the problem. Determine which amount of months, \( m \), is correct by solving the equations algebraically.

Equation #1: \( 40m + 40 = 250 \)
Equation #2: \( 40m - 40 = 250 \)

Which equation is correct?
- A. Equation #2
- B. Equation #1
- C. Neither Equation #1 or Equation #2

What would be the correct first step to solve for \( m \) number of months?
- A. Subtract 40 from 250.
- B. Add 40 to 250.
- C. Add 40 to 250.
- D. Subtract 40 from 250.

What would be the correct second step to solve for \( m \) number of months?
Complete M2-L23 Exit Ticket by the assigned due date.

Mr. Harris paid $34 as a down payment for athletic t-shirts for the sports team members at school. Each shirt cost $8 in addition to the down payment. The total cost for the shirts was $426. How many t-shirts were purchased?

Mr. Harris purchased __ t-shirts.

What is the equation to model this situation?

- A. \( 426 + 8s = 34 \)
- B. \( 8 + 34s = 426 \)
- C. \( 34 + 8s = 426 \)
- D. \( 34 - 8s = 426 \)

What is the correct first step to find the number of shirts Mr. Harris purchased?

- A. Subtract 34 from 426.
- B. Subtract 8 from 425.
- C. Add 8 to 426.
- D. Add 34 to 426.

What is the correct second step to find the number of shirts Mr. Harris purchased?

- A. Multiply by 8.

Click to select your answer(s).
1. You start on the number line at 9 and count until you are on the number 5, what number did you add to 9 to get there?

2. a. To go from 9 to 5 on the number line, you must add ______.

b. On a separate sheet of paper, write a real-world story problem that would fit this situation. Be sure to mention the numbers you are using.

c. Use absolute value to express the distance between 9 and 4. The distance from 9 to 4 can be expressed by the absolute problem |9 - 4| = ______.
M2-Mid-Module Assessment: QUESTION ID 7.2.MMA.2 (new)

Complete the M2-Mid-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and enter your answer in the answer box.

2. What value of \(d\) will make the equation a true statement?

\[
\frac{3}{8} \times \frac{8}{3} + d = 0
\]

\(d = \) [Give your answer as an integer, fraction, mixed number, or terminating decimal]
Complete M2-Mid-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and turn in by the assigned due date.

3. When Sharon bought a house, she set up automatic payments (withdrawals) to be transferred from her bank account to her house note. Every month, the same amount is paid on her house note. At the end of the year, her bank account balance changed by $-11747 from payments made on her house note.

a. What is the change in Sharon’s bank account balance each month due to her house note payment?

The change in Sharon's bank account balance each month is $ \boxed{ }$. (Round to the nearest cent.)

b. What is the change in Sharon’s bank account balance after making 9 monthly payments on her house note?

The change in Sharon's bank account balance after making 9 monthly payments is $ \boxed{ }$. (Round to the nearest cent.)
Complete M2-Mid-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and turn in by the assigned due date.

4. Jessica completes money transactions of the following amounts:

$6, $5, $8, $-6

a. What is the overall total amount of the money transactions that Jessica has completed?

The overall total amount of money transactions that Jessica has completed is $\_\_\_\_\_\_\_\_\_\_\_\_\_$. 

b. Jessica makes two more transactions, but it does not affect her overall amount of money transactions. Which of the following amounts could be her two transactions?

- OA: $6, $-6
- OB: $-5, $-4
- OC: $7, $-6

Click to select your answer(s).
Complete M2 Mid-Module Assessment by the assigned due date. For the parts on complete on a separate sheet of paper, number and letter each problem and turn in by the assigned due date.

1. The cheerleading coach bought 22 feet of ribbon to make bows for each cheerleader. The coach will cut the ribbon into 13 equal size pieces for each cheerleader to have. When cutting the ribbon, with special scissors to prevent unraveling, 0.19 of an inch is lost with each cut. How much ribbon will this cause to be lost from the total length of the ribbon?

2. The total amount of usable ribbon that will be left after cutting each piece will be ______ inches. (Round your answer to the nearest hundredth of an inch.)

3. How much usable ribbon will be left after factoring in what will be lost from cutting it into equal pieces? The total amount of usable ribbon that will be left after cutting it into equal pieces will be ______ inches. (Round your answer to the nearest hundredth of an inch.)

4. b. After making the cuts, what will be the exact length of each cheerleader’s ribbon be? Each cheerleader’s ribbon will be ______ inches long. (Round your answer to the nearest hundredth of an inch.)
Complete M2-Mid-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and turn it in at the assigned due date.

6. When dividing a money amount, you have a score of $2, but the number of coins gives you a score of $10. Your friend, Tammy, tells you one of your cards that had a value of 7. You believe your new score is 2, but your teacher tells you it is 10. Here is your reasoning: Removing a negative card is the same as adding the same positive card, and this will increase the score. – 7 minus – 7 is 0. 0 + 30 = 30.

Who is correct?
A. You are correct.
B. Tammy is correct.
Complete M2-Mid-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and turn in by the assigned due date.

7. The table below gives the temperature changes one day in Anchorage, Alaska over a 4-hour period after a cold front came through.

   a. If the beginning temperature was $-15^\circ F$ at 5:00 a.m., what was the temperature at 9:00 a.m.?

<table>
<thead>
<tr>
<th>Change in Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 a.m. – 6:00 a.m.</td>
</tr>
<tr>
<td>6:00 a.m. – 7:00 a.m.</td>
</tr>
<tr>
<td>7:00 a.m. – 8:00 a.m.</td>
</tr>
<tr>
<td>8:00 a.m. – 9:00 a.m.</td>
</tr>
</tbody>
</table>

   The temperature at 9:00 a.m. was $[]^\circ F$.

   b. The same cold front went through Seattle, Washington the next morning. The temperature dropped by $8^\circ F$ each hour from 5:00 a.m.–9:00 a.m. What was the beginning temperature at 5:00 a.m. if the temperature at 9:00 a.m. was $-11^\circ F$?

   The beginning temperature at 5:00 a.m. was $[]^\circ F$.

   c. Which one of these expressions is not a correct method that will give you the correct answer to part (b)?

   - $\text{A. } -11 + 8 + 8 + 8$
   - $\text{B. } (4 \cdot 8) + -11$
   - $\text{C. } 11 + 8 + 8 + 8$

   Click to select your answer(s).
Complete M2-End-of-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and turn in by the assigned due date.

1. When filling the pool at your aunt’s house, the water level changes at an average of \(-\frac{6}{12}\) inch every 4 minutes.
   a. Based on the rate given, how much will the water level change after one minute?
      After one minute, the water level has changed \(\) inch. (Give your answer in decimal form rounded to the nearest hundredth.)

   b. How much would the water level change after 8 minutes?
      After 8 minutes, the water level will change \(\) inches. (Give your answer in decimal form rounded to the nearest hundredth.)

   c. On a separate sheet of paper, explain whether your answer from part (b) is a repeating or terminating decimal. Be sure to include the values in your problem in your explanation. Prove whether it is repeating or terminating by using long division.
2. Hannah and Clay are going to sell lemonade at the local school fair. To have their lemonade booth, they must pay $6 to rent the spot they will sell from. They have calculated the cost per lemonade to be $0.51 and they will charge $2.00 per lemonade.

a. If $L$ represents the number of lemonades sold at the fair, which of the following expressions would represent Hannah and Clay's profit? (Give all choices that apply.)
   A. $-16+2.00L - 0.51L$
   B. $2.00L - 16 - 0.51L$
   C. $2.00L - 16$
   D. $2.51L - 16$
   E. $1.49L - 16$

   The expressions that represent Hannah and Clay's profit are [ ] . (Give the letter(s) of the expressions that apply. Use a comma to separate your choices.)

b. Hannah and Clay want to sell enough ornaments to at least cover expenses so they do not lose any money. Hannah thinks they need to sell 13 lemonades to cover their costs. Do you agree?
   ○ A. No, Hannah is not correct.
   ○ B. Yes, Hannah is correct.

If you do not agree, what do you think is the number of lemonades they need to sell?
   The number of lemonades Hannah and Clay need to sell is [ ] . (Give your answer as an integer. If you agree with Hannah, give the answer that she says is correct.)

c. Hannah and Clay would like to make a profit of $80 altogether. How many lemonades do they need to sell to make this much profit?
Complete M2-End-of-Module Assessment by the assigned due date. For the parts you complete on a separate sheet of paper, number and letter each problem and turn in by the assigned due date.

3. Jennifer was notified by her bank that her checking account balance dropped below zero. Below are her account transaction records that she keeps.

<table>
<thead>
<tr>
<th>CHECK NO.</th>
<th>DATE</th>
<th>DESCRIPTION OF TRANSACTION</th>
<th>PAYMENT</th>
<th>DEPOSIT</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1034</td>
<td>1/17</td>
<td>Beginning Balance</td>
<td>—</td>
<td>—</td>
<td>$373.50</td>
</tr>
<tr>
<td>1034</td>
<td>1/18</td>
<td>Electronics Express</td>
<td>$66.00</td>
<td>—</td>
<td>$440.50</td>
</tr>
<tr>
<td>1035</td>
<td>1/22</td>
<td>Sporting Goods</td>
<td>$79.00</td>
<td>—</td>
<td>$561.50</td>
</tr>
<tr>
<td>1035</td>
<td>1/22</td>
<td>Clothing</td>
<td>$79.00</td>
<td>—</td>
<td>$561.50</td>
</tr>
<tr>
<td>1036</td>
<td>1/25</td>
<td>Grocery Store</td>
<td>$35.50</td>
<td>—</td>
<td>$526.00</td>
</tr>
<tr>
<td>1036</td>
<td>1/25</td>
<td>The Bike Shop</td>
<td>$202.00</td>
<td>—</td>
<td>$328.00</td>
</tr>
<tr>
<td>1036</td>
<td>1/25</td>
<td>Cash Deposit (Babysitting Money)</td>
<td>$20.00</td>
<td>—</td>
<td>$348.00</td>
</tr>
<tr>
<td>1036</td>
<td>1/30</td>
<td>Sammy’s Sandwiches</td>
<td>$6.75</td>
<td>—</td>
<td>$354.75</td>
</tr>
</tbody>
</table>

Lines 1, 2, 3, 4, 5, 6

a. On which line did Jennifer make a mathematical error?
   - A. Line 1
   - B. Line 2
4. When wrapping this birthday card, Sherry ties a ribbon around it that surrounds the front and back of the card. The card length is \( \frac{7}{2} \) inches, and the card width is \( \frac{3}{5} \) inches long. Find the length and width of the ribbon.
Jeremy and Megan are comparing the amounts of money they have spent and gained in the last week. Their money exchanges are shown below.

Jeremy's Money
- $3
- $7

Megan's Money
- $3
- $7
- $4
- $5

5. What is the overall balance of amount of money spent and gained for each person?

a. Jeremy's balance: $3
   - Their overall balance will decrease by $3, so you would subtract 3.
   - Their overall balance will decrease by $3, so you would add 3.
   - Their overall balance will not change.

b. Megan's balance: $3
   - Their overall balance will increase by $3, so you would add 3.
   - Their overall balance will increase by $3, so you would subtract 3.
   - Their overall balance will not change.
### PART 3: ADDITIONAL PROBLEMS

M1-L1-Example 1: QUESTION ID 7.1.1.Ex1

#### Table 1: Performance of Players Across Classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Time (in seconds)</th>
<th>Number of Paper Passed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd</td>
<td>13</td>
<td>29</td>
</tr>
<tr>
<td>3rd</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>4th</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>5th</td>
<td>7</td>
<td>29</td>
</tr>
</tbody>
</table>

Complete the following table to determine which class passed the fastest and the unit rate of each class. Write your ratios in the form a:b. Round your unit rate answers to the nearest tenth.
Carrie has 3 close friends that are females and 9 close friends that are males. In the 7th grade, there are 17 females and 63 males. Are the ratios of females to males equal?

- Yes, the unit rates are equivalent.
- No, the unit rates are not equivalent.

The unit rate of Carrie's close friends is ______ females per male. (Round to the nearest hundredths.)

The unit rate of the 7th graders is ______ females per male. (Round to the nearest hundredths.)
Cameron's parents told him for every 11 minutes he spends reading, he can have 10 minutes on the computer. Morgan's parents give her 3 minutes of computer time for every 9 minutes she reads. If both Cameron and Morgan spend an hour reading, which person gets more time on the computer? How much time do they each get and what is the difference between their amount of minutes on the computer?

A. Morgan gets more time on the computer.
B. Cameron gets more time on the computer.

Cameron will get about ___ minutes of computer for every hour he spends reading.
Morgan will get about ___ minutes of computer for every hour she spends reading.
The person with more computer time gets ___ more minutes than the other person.
At the local football league, 28 boys tried out for offense and 15 made it. 56 tried out for defense and 30 made it. Are the ratios of the number of boys who tried out and made it the same for both offense and defense? How do you know?

a. No, the ratios are not the same.

b. Yes, the ratios are the same because they both equal (Give your answer as a ratio in the form of a fraction.)
Alyssa buys a 36-pack of water for $8.99. Her friend says that each bottle of water is about $4. Is her friend correct? Give the unit rate per bottle to prove your answer.

☐ A. No, her friend is not correct.
☐ B. Yes, her friend is correct.

The unit rate per bottle is $\boxed{\$0.25}$. (Round to the nearest cent.)
You need to raise money for a school band field trip. You buy 48 candy bars for $33.00 to re-sell to your friends and family as a fundraiser. If you want to make a profit of $2.00, how much do you need to charge for each candy bar?
You and your family go to your favorite fruit and vegetable at the fruit stand. When you weigh the produce to see your total cost for each item, this is what you find:

<table>
<thead>
<tr>
<th>Weight (pounds)</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4</td>
<td>15.00</td>
</tr>
<tr>
<td>9</td>
<td>10.89</td>
</tr>
<tr>
<td>5</td>
<td>6.05</td>
</tr>
<tr>
<td>8</td>
<td>9.68</td>
</tr>
</tbody>
</table>

Does everyone pay the same cost per pound?

☐ Yes, each item costs $1 per pound.
☐ No, each item does not cost the same per pound.
You and your family go get your favorite fruits and vegetables at the fruit stand. When you weigh the produce to see your total cost for each item, this is what you find.

<table>
<thead>
<tr>
<th>Weight (pounds)</th>
<th>12.1</th>
<th>9</th>
<th>5</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost ($)</td>
<td>8.71</td>
<td>6.48</td>
<td>3.60</td>
<td>5.76</td>
</tr>
</tbody>
</table>

If every item you get cost the same per pound, how much would it cost for 18 pounds?

$\_

How much would you pay if you don’t get any fruits or vegetables?

$\_
You and your family go to your favorite fruits and vegetables at the farmers market. When you weight the produce to see your total cost for each item, this is what you find.

<table>
<thead>
<tr>
<th>Weight (pounds)</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5</td>
<td>7.48</td>
</tr>
<tr>
<td>10</td>
<td>6.50</td>
</tr>
<tr>
<td>6</td>
<td>5.99</td>
</tr>
<tr>
<td>8</td>
<td>5.20</td>
</tr>
</tbody>
</table>

If every item you get cost the same per pound, how much would it cost for 15 pounds?

If the variable w represents the weight and e represents the cost, what would the equation be to find the value of w?
M1-L2 Example 2: QUESTION ID 7.1.2.Ex2

In a carpentry instruction book, this measurement chart is given to help with conversions.

<table>
<thead>
<tr>
<th>Inches</th>
<th>Centimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1.5</td>
<td>3.81</td>
</tr>
<tr>
<td>2</td>
<td>5.08</td>
</tr>
<tr>
<td>3.5</td>
<td>8.89</td>
</tr>
<tr>
<td>5</td>
<td>12.70</td>
</tr>
<tr>
<td>10.16</td>
<td></td>
</tr>
</tbody>
</table>

Is the number of centimeters proportional to the number of inches?
- A. Yes
- B. No
- C. There is not enough information.

How many centimeters are there in 11 inches?
- A. 27.94 centimeters
- B. 27.94 centimeters

How many centimeters are there in 10 inches?
- A. 25.40 centimeters
- B. 25.40 centimeters

How do you know?
- A. Divide the number of inches by 0.3937

Click to select your answer(s).
You are going to save your money from your summer babysitting job to buy some new head phones to listen to music. Here is a table showing how much money you have earned after a certain number of weeks. Complete the table.

<table>
<thead>
<tr>
<th>Week</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Earnings</td>
<td>□</td>
<td>34</td>
<td>□</td>
<td>□</td>
<td>138</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

If you need $180 to purchase the head phones, will you have enough money by the end of the summer?

- **A.** Yes, you will have enough money. You will have $□ more than you need.
- **B.** No, you will not have enough money. You will need another $□.
- **C.** There is not enough information.

Are your total earnings proportional to the number of weeks you babysit? How do you know?

- **A.** No, because there is no constant value being multiplied by the number of weeks.
- **B.** No, because you earned different amounts each week.
- **C.** Yes, because you earned □ by the end of the summer.
- **D.** Yes, because you earned a constant value of $□ every week.
M1-L2 Exercise 1: QUESTION ID 7.1.2.Exer1

Adam ran in a race with these distances at the one minute time splits.

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Distance (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>7</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Is the distance proportional to time?

A. Yes
B. No
C. There is not enough information.

How many miles will Adam run in 8 minutes?

A. Multiply the number of minutes by 0.5
B. Multiply the number of minutes by 0.75
C. Multiply the number of minutes by 1.0

How many miles will Adam run in 5 minutes?

A. 2.5
B. 3.0
C. 3.5
The flower displays for a wedding have the ratio of peonies to roses as 2 to 5. Complete the table below to show that the different amounts that are proportional.

<table>
<thead>
<tr>
<th>Peonies</th>
<th>10</th>
<th></th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roses</td>
<td>65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These values are proportional because they all simplify to □.
It takes 5 minutes to fill a small swimming pool with $\frac{1}{2}$ feet of water. Sam estimates it will take another 45 minutes to fill the 5 foot deep pool with water. Is he correct?

Explain your answer.
It takes 5 minutes to fill a small swimming pool with $\frac{1}{2}$ feet of water. Sam estimates it will take another 45 minutes to fill the 5 foot deep pool with water. Is he correct?

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Pool Water Height (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>45</td>
<td>4</td>
</tr>
<tr>
<td>50</td>
<td>5</td>
</tr>
</tbody>
</table>

Choose the best answer:

- A. Yes, he is correct. It will take another 45 minutes to fill the pool.
- B. No, he is incorrect. It will take more than 45 minutes to fill the pool.
- C. Yes, he is correct. It will take a total of 45 minutes to fill the pool.
- D. No, he is incorrect. It will take another 50 minutes to fill the pool.
Complete M3-L12 Sprint-Round 1 by the assigned due date.

1. \( x + 1 = 5 \)  \( x = \) 
2. \( x + 2 = 5 \)  \( x = \) 
3. \( x + 3 = 5 \)  \( x = \) 
4. \( x + 4 = 5 \)  \( x = \) 
5. \( x + 5 = 5 \)  \( x = \) 
6. \( x + 6 = 5 \)  \( x = \) 
7. \( x + 7 = 5 \)  \( x = \) 
8. \( x - 5 = 2 \)  \( x = \) 
9. \( x - 5 = 4 \)  \( x = \) 
10. \( x - 5 = 6 \)  \( x = \) 
11. \( x - 5 = 8 \)  \( x = \) 
12. \( x - 5 = 10 \)  \( x = \) 

Enter your answer in each of the answer boxes.
VITA

Erin Ashley Glover was born to Jerry and Mary Glover in Plano, Texas in December 1983. She attended primary school and secondary school in Richardson, Texas and Baton Rouge, Louisiana. She graduated from Central High School in Central, Louisiana in 2002 as Summa Cum Laude. The following August, she entered Louisiana State University and in December 2006 earned a Bachelor of Science degree in Elementary Education (1-8). In January 2007, Erin continued at Louisiana State University Graduate School and earned a Master of Education degree in Educational Technology Leadership in May 2009. She entered Louisiana State University Graduate School in June 2012 and is a candidate for the Master of Natural Science Degree. She currently teaches math at Sherwood Middle School in Baton Rouge, Louisiana.