This course of study outlines the sequence of learning activities to help you develop competence in the subject area of Finite Mathematics. Your competence will be fully demonstrated in this subject area as you complete an objective assessment (GAC 1 or 2) and a performance assessment (GAT 1 or 2). This course of study may take up to five weeks to complete depending on your educational background, work experience, and hours that you are able to dedicate to your studies. Consult with your mentor if you wish to accelerate through this course of study.

Introduction

So why are we here? As parents, grandparents, uncles, aunts, community members, employers, and teachers, we hear all the time, "I'm just not good at math," or "I can't learn math," or "Math is hard!" How did math get such a bad reputation? Well, I hope you are here because, like me, you want to:

- Become a change agent to take our children's fears, dislike and lack of confidence in learning mathematics and transform them into the love of the wonder, beauty and usefulness of mathematics!
- Make the most out of your investment at Western Governors University (WGU) by satisfying your own curiosity and your commitment to lifelong learning.
- Be or remain gainfully employed or be a valued volunteer tutor or mentor—we need competent and caring math teachers!

If you are just starting out on a teaching career, you will love learning all the intricate ways to stimulate and inspire your students. For those of you who have been in the classroom already, I trust you will find ways to expand your creativity and enhance your effectiveness as a teacher. Do all that you can to soak up what is offered to you in your WGU mathematics education program! Teaching is all about learning.

Competencies:

There are several academic competencies associated with this Finite Math course of study that will be addressed over the next several weeks. The list is a good overview of precisely what you will know and be able to do at the conclusion of this course of study and demonstrate through the exam and performance assessment. There are three competency areas—the real number system, basic number theory, and an introduction to discrete mathematics. This mathematics is foundational to the study of higher mathematics. This course of study covers the following competencies:

**Competency: Discrete Mathematics**
The graduate applies the fundamental ideas of discrete mathematics including logic, set theory, and graph theory in formulating and solving problems.

**Competency: Real Number System**
The graduate demonstrates computational proficiency with real numbers and recognizes the properties of the real number system and its subsets.

**Competency: Number Theory**
The graduate represents numbers in different forms, recognizes relationships among number and number systems, deduces the meanings of operations, and demonstrates a conceptual understanding of numbers.

**WGU Statement of Teaching Dispositions**

Please review the [WGU Statement of Teaching Dispositions](#).

**Required Learning Resources:**
• Thinkwell College Prealgebra Online
• Best Practices Tool: study notebook

**Being a Successful Mathematics Student and Teacher**

As this is your first official course of study in the mathematics program at WGU, you will want to take the time to become familiar with the resources and process. Becoming successful starts with good planning and organization.

After completing this first week's activities, you should have:

- Enrolled in your two required online learning resources.
- Practiced navigating the online learning resources by working through the tutorials in each.
- Secured and prepared a study notebook as a best practices tool.
- Viewed the video "Multiple Intelligences and Math."
- Explored the message board for Finite Mathematics in 5-9 Math Education.
- Prioritized and scheduled your learning activities.
- Completed the activities for the topic of Inductive and Deductive Reasoning.
- Taken the preassessment for GAC1 or GAC2.

**Topics**

**Motivation, Attitude, Skills and Knowledge**

Whether you are initiating, changing, or expanding your career, what you learn throughout your mathematics program will help you internalize your *Motivation, Attitude, Skills and Knowledge (MASK)* and transfer your love and knowledge of math to your students in the classroom.

**Resources**

**Get the Tools You Need**

**URLs:**

Course Compass:
http://www.coursecompass.com

Thinkwell:
http://www.thinkwell.com

Enroll now in the two required resources from your AAP:

- **MyMathLab and Thinking Mathematically** (Blitzer multimedia online textbook). This is an independent study course provided to you by WGU. You do not need to purchase the resource. The multimedia textbook is online. Additionally, there are videos, practice problems, and quizzes in MyMathLab. After enrolling in this course, you will be e-mailed access information to the Pearson Course Compass website. You will be sent a link to the site with your username and password. If you have questions about enrolling in the resource, seek the advice of your mentor.
- **Thinkwell Prealgebra Online.** This is an independent study course provided to you by WGU. You do not need to purchase the resource. This resource will provide extra practice with basic operations, especially working with fractions. After enrolling in this course from your AAP, you
will be sent access information to an online website with study notes, video lectures, and review questions.

*Note: You do not want to wait until you are ready to study only to discover there is a technical problem preventing your access to these valuable resources. Go ahead and explore how these two resources work. Take the tutorials so that you know how to access everything quickly.*

- **Best Practices Tool:** Get a study notebook. It is suggested that you create a paper or digital notebook for your study notes as you go through this document. Use organizers or dividers to separate your work. You may want to include a glossary, study notes, topics to revisit, and helpful websites.

### Build Your Motivation and Confidence

Log in to your CourseCompass MyMathLab account. Click on Thinking Mathematically by Blitzer. On the left menu, choose "Chapter Contents". Click on "Tools for Success." Please watch Math Anxiety Video 2 entitled "Multiple Intelligences and Math." Use this opportunity to be both the student and the teacher. As a student you will be asked to demonstrate your competence in math. As a teacher, you will need to know how to help your own students learn and demonstrate competence in math. If you are interested, view the other videos, to develop effective strategies in developing confidence in abilities.

### Using the Message Board

In the lower right-hand corner of the course of study screen there is a message board area. Throughout your studies, you will want to follow the questions, observations, and responses of the other students and the expert advice of the course mentor. If you have questions of your own, do not hesitate to use this resource to get those answered as you develop your competencies.

In the study of human development, we have found that often you can learn substantially more when working with others than you can learn in isolation. Try it out. See if it is true for you!

### Apply Math to the Real World

Enjoy learning how to apply your knowledge and skills. From consumer math to calculus, most of us want the following question answered: Why do I need to know this? The texts and resources that you will have in your mathematics programs are rich with applications. Do not skip them! Remember as was seen in the video "Multiple Intelligences and Math," we come to math with different strengths and approaches. Building upon what you already know through your real-life experiences will inspire and enhance your creativity in teaching. Visit the Math message board to discuss applications with other students.

### Maximize Your Time

Test your prior knowledge. WGU allows students under certain conditions to accelerate through the program. This course of study has pacing suggestions to keep you on track with your satisfactory progress. However, if you already have mastered the concepts and can move faster, please do so. **Be sure to set goals, make a plan, and reward yourself often! Getting a degree is challenging, so make a plan that works for you.**

### Graphing Calculator

Most graphing calculators are permissible on WGU mathematics and science exams. Refer to the [WGU Calculator Guidelines](#) for specific details regarding acceptable calculators.
We recommend that all students in secondary mathematics and science education programs obtain a TI-83+, TI-84+, or TI-Nspire (non-CAS) graphing calculator. These models are allowed on all WGU math and science exams; they are relatively inexpensive and easy to learn; they include scientific notation, advanced functions, and graphing capability; they are the most popular calculators on the market and in the classrooms, thus, you are more likely to encounter them in your current or future school; and they come with the ability to connect with the calculator-based laboratory (CBL) and calculator-based ranger (CBR) portable data collection devices. These devices allow you to collect data on motion, light, temperature, and voltage and are essential in any middle or high school mathematics or science classroom. To transfer screenshots from your TI calculator to your computer you will need a TI Connectivity Kit, available at the following site: http://education.ti.com/educationportal/sites/US/productDetail/us_ti_connectivity_kit.htm

**Critical Thinking in Mathematics**

This subject presents an introduction to inductive and deductive reasoning in mathematics, including identifying and analyzing patterns and the problem solving process. As an adult learner, you use the critical thinking skills inherent in mathematical reasoning frequently because these are the same critical thinking processes that are transferable to many practical situations you encounter in everyday activities and in decision making. After finishing this subject area, you will be able to define inductive and deductive reasoning, analyze simple patterns and models for problem solving, and assess your prior knowledge.

**Topics**

**Induction and Deductive Reasoning**

Even if your mathematics skills are advanced, take the time to read and reflect upon the first chapter of your new learning resource, Thinking Mathematically by Blitzer. This chapter should only take you a couple of days to advance through. Within this topic, you will learn strategies for thinking logically, viewing and analyzing patterns, and using models and plans to problem solve in mathematics. Internalizing the process of critical thinking and problem solving can also help you now in this course of study, in future math studies, and in teaching of others.

Throughout this course of study, you will be routinely directed to do three specific activities:

1. Read the text or watch a video
2. Work tracked tutorial exercises in MyMathLab
3. Record your notes, understandings, and questions in your study notebook

These three basic activities help build your skills as an independent learner.

**Resources**

**Critical Thinking and Problem Solving**

Refer to chapter 1 in *Thinking Mathematically*. In your study notebook, summarize the difference between inductive and deductive reasoning. Give an example of both.

Practice MyMathLab tracked tutorial exercises for chapters 1.1-1.3 in *Thinking Mathematically*. In the exercises, if you need help, you can choose "Help Me Solve This" which walks you through the steps. Some exercises may have a video explanation.

**Assess Prior Knowledge**
After scanning this course of study, if you feel that you already are competent in the areas of mathematics that is covered here, take the preassessment. This referral is available through your AAP.

1. Log in to your MyWGU Student Portal.
2. Go to the "My AAP" tab.
3. In the list below "Course Details," find the assessment you are working on.
4. In the "Assessment Preparation" column, click "Preassessment."
5. In the window that pops up, click "Click here to refer for this preassessment." A request will be sent to your mentor for approval.
6. Once your mentor has approved your request, return to the "My AAP" tab and click "Preassessment" in the "Assessment Preparation" column.
7. In the window that pops up, click "Click here to take this preassessment." You will then begin the preassessment.

Your results will also be available from the AAP in the form of a coaching report. This pretest will give you a good idea of the topics in the course of study that you have already mastered through previous learning opportunities, as well as topics for which you need a refresher and those that are new to you and will require your in-depth study.

## Set Theory

This is an introduction to the study of set theory, including symbolic and graphical representations of set operations. After finishing this subject area, you should be able to accurately solve problems involving the union and intersection of sets, subsets, or disjoint sets in real-world applications and represent set data graphically.

### Topics

#### Sets and Operations

Within this topic, you will learn definitions and symbols associated with sets, subsets, and disjoint sets. You will also learn how to represent set relationships through Venn diagrams, finding union and intersection, and apply set theory to real-world applications.

### Resources

#### Language, Symbols, and Application of Set Theory

Read chapter 2 of *Thinking Mathematically*. Do you know how to define empty set, subset, disjoint set? Write these definitions in your study notebook.

#### Performing Set Operations

Practice MyMathLab tracked tutorial exercises for chapters 2.3-2.4 in *Thinking Mathematically*. Take the time to learn how to use MyMathLab. In the exercises, if you need help, you can choose to "View an Example" which will give you a similar problem worked correctly. You may also choose "Help Me Solve This" which walks you through the steps. Some exercises may have a video explanation.

## Logic
This is an introduction to the study of logic, including truth tables. After finishing this subject area, you should be able to recognize logic statements, interpret statements accurately with logical connectives and quantifiers, and create truth tables to determine the truth value of a given logic statement.

**Topics**

**Statements and Negation**

Within this topic, you will learn how to symbolically represent logic statements and negation. Use your study notebook to address the following: What is the difference between an English sentence and a statement in the study of logic? Define and give examples of statements in the study of logic. What does negation mean? How is negation symbolized?

**Resources**

**Statements of Symbolic Logic**

Refer to chapter 3.1 of *Thinking Mathematically*. Take notes in your study notebook.

**Logical Quantifiers and Connectives**

Within this topic, you will learn the meanings of the following quantifiers in logic statements: *some*, *all*, and *none* (or *no*). The concept of "quantify" should be familiar to you. Let your conceptual understanding of the term guide your learning. Apply your understanding of the term "quantify" to the concept of logical quantifiers. If you use this technique of conceptual learning, you may not need to memorize terms. You may need to review the examples of how you negate a quantified statement. You will also learn the different symbols and meanings to illustrate connectives in compound logic statements for *and*, *or*, *if*, *then* and *if and only if*.

In your study notebook, summarize in your own words the difference between quantifiers and connectives. Can you give examples of their use in logic statements? How do you apply the dominance of connectives?

**Resources**

**Working With Quantifiers**

Refer to chapter 3.1 of *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 3.1.

Refer to chapter 3.2 of *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 3.2.

**Truth Tables**

Within this topic, you will learn how to determine the truth value of a logic statement by creating a truth table. Review statements and negation to be successful in this topic area.

**Resources**

**Creating Truth Tables**

Practice MyMathLab tracked tutorial exercises for chapters 3.3-3.4 in *Thinking Mathematically*. 
Number Theory

Number theory consists of understanding counting numbers and operations and properties involving prime and composite, odd and even numbers, factors, multiples. This section also includes modular arithmetic, rounding, truncation, and applications to middle school mathematics. After finishing this subject area, you should be able to solve problems that involve counting numbers; explain how to prove a given theorem involving the concepts of prime and composite numbers; apply the order of operations; explain rounding and estimation, truncation and how these are applied in mathematics at grade levels 5-9; and demonstrate how to add or multiply in a given mod n.

Topics

Prime and Composite

Within this topic, you will define and solve problems with prime and composite numbers. Be sure that you understand and can explain the concepts of divisibility, multiples, and factors. In your study notebook, define in your own words what an odd number is. What is an even number? How do you represent odd and even numbers mathematically? What is the difference between a prime number and a prime factor? Is 0 a prime number? Is 1 a prime number? Work to develop conceptual understanding, rather than memorization, of these numbers and properties.

Resources

Working With Prime and Composite Numbers

Refer to chapter 5 of Thinking Mathematically. Practice MyMathLab tracked tutorial exercises for chapter 5.1.

Proofs of Theorems of Prime and Composite Numbers

Within this topic, you will learn the definition of theorem. You will explore theorems involving the concepts of prime and composite numbers. You will want to be able to explain how to prove a theorem involving prime and composites. For example, how would you prove that the only two consecutive prime numbers are 2 and 3?

Resources

Introduction to Proofs

URLs:
http://zimmer.csufresno.edu/~larryc/proofs/proofs.html
http://www.cut-the-knot.org/proofs/

These websites provide an introduction to proofs. You don't need to know all of these different types of proofs. For now, you need to be familiar with what proofs are and the reasoning behind the different approaches to proofs.

Explaining Proofs

Define prime and composite and explain how to prove a given theorem involving these concepts.

*Note: You are not being asked to prove something. Take a proof that someone else has done, and describe the flow and logic of it.*
There are numerous proofs that involve prime and/or composite numbers. One example is "The only two consecutive prime numbers are 2 and 3." You may also find others on the websites listed in the previous activity. Conduct an Internet search for "infinitely many primes" or "no largest prime." Choose something that is not too complex to practice.

**Integers - Order of Operations**

Within this topic, you will explore the set of integers and given a problem, and you will learn how to apply the order of operations. You will need to review powers/exponents. In your study notebook, note how the integers differ from counting (natural) numbers.

**Resources**

**Using Order of Operations**

**URL:** [http://www.thinkwell.com](http://www.thinkwell.com)

Watch video lectures and review notes in chapter 2.2, "Operations with integers" at Thinkwell Prealgebra Online. Chapter 2 reviews powers/exponents and using the order of operations.

**Order of Operations of Integers**

Refer to chapter 5.2 of *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 5.2.

**Rounding and Truncation**

Within this topic, you will learn the rules of rounding and truncation to solve problems. If you need review about operating with decimals, see chapter 4 of Thinkwell Prealgebra Online. State in your own words what truncating means. What is rounding? Can you give examples?

**Resources**

**Rounding and Estimation**

Revisit chapter 1.2 of *Thinking Mathematically* to review the rules of rounding. Be sure to use your study notebook to distinguish your understanding of the different terms and rules of estimation.

**Rounding**

**URL:** [http://www.thinkwell.com](http://www.thinkwell.com)

Watch video lectures and review notes in chapter 4.1.2 on working with rounding of decimals in Thinkwell Prealgebra Online.

**Defining and Contrasting Rounding and Truncation**

Conduct an Internet search for truncation and rounding numbers. Find two to three websites that help you to define the operations and distinguish between the two words.

**Rounding and truncation rules and examples**

Review "[The Rules for Rounding and Truncation](http://www.thinkwell.com)" PDF for rules about rounding and truncation and examples.
Applications of Rounding and Truncation for Middle School

Within this topic, you will discover examples of how truncation and rounding are practically applied and taught in the middle school classroom. If you have not been to a middle school in a while, do a bit more research about the level of mathematics that is presented to this age group. This is a good time to visit and participate in the message board to discuss the types of math topics covered in middle school.

Resources

Rounding Applications

Revisit chapter 1.2 of *Thinking Mathematically* to review the applications of rounding.

Significant Figures and Estimating


This website is designed for teachers to introduce techniques and uses for rounding and/or truncation to students.

Middle School


This website lists the standards for 6-8 grade mathematics. This may help you better understand the type of math that is appropriate for middle school math students.

Truncation and Rounding

Explain truncation and rounding and their application in grades 5-9 mathematics. The applications can be from math, science, and business.

Use your study notebook to make a list of why one would want to round. For example:

- The answer must be a whole number.
- It is easier to work with rounded numbers.
- Some numbers (irrational) must be rounded.
- It is easier to communicate rounded numbers.
- You must round when you measure.
  
  Can you think of other reasons to round?

Make a list of different reasons why one would truncate. For example:

- It can be easier than rounding (particularly for computer applications).
- Rounding up may not be acceptable, such as when you are measuring a desk to see if it will fit through your front door.

Can you think of other real-world applications that would require truncating?

As you work on the Finite Math performance task, your explanation should extend beyond just stating the mathematical definition for rounding and truncating numbers. It should also include relevant examples which use rounding and truncation.

Plan to think carefully about what possible real world ramifications are associated with each
process. Where might a rounding or truncating result have implications? Hint: Think about what happens when a pharmacist prepares an IV solution containing a specified amount of a potent drug. Do you think that it matters whether or not the pharmacist rounds or truncates the measured weight of the drug which is mixed in the solution? As a mathematics educator, students should be sensitive to what the implications would be if one were to round or truncate given selected situations. In the previous example, if the pharmacist rounds up (e.g., 0.56 g to 0.6 g) or rounds down (e.g., 0.43 g to 0.4 g) - it will influence how much of the amount of the drug which is dissolved into the IV solution. If the pharmacist were to truncate (e.g., 0.57 g to 0.5 g), one may end up with an underestimate of how much drug should be dissolved in the IV solution. To that end, the reasons for understanding rounding and truncating numbers are linked to such influences. The right answer is connected to such influences.

**Modular Operations**

Within this topic, you will learn how to add and multiply with mod n. Take the time to explain modular operations, beyond adding and multiplying, as if you were explaining the operations to a student.

Modular arithmetic is often called clock arithmetic. In terms of an everyday clock, what time of the day is 5 mod 12? Be careful when working with negative numbers. It is tempting to think that -2 mod 7 is congruent to 2 mod 7. This is not true! If you need more resources on modular arithmetic and working with negatives, conduct an Internet search.

**Resources**

**Modular Operations**

Refer to chapter 13 of *Thinking Mathematically*. Complete textbook exercises 23-41 in section 13.2.

Refer to the following link for additional modular arithmetic examples

**Additional Modular Arithmetic Resources**

**URLs:**
- [http://www.math.rutgers.edu/~erowland/modulararithmetic.html](http://www.math.rutgers.edu/~erowland/modulararithmetic.html)
- [http://britton.disted.camosun.bc.ca/modarith/number_bracelets/mod_arith.html](http://britton.disted.camosun.bc.ca/modarith/number_bracelets/mod_arith.html)
- [http://www.brainjammer.com/math/modular-arithmetic/](http://www.brainjammer.com/math/modular-arithmetic/)

These websites give an overview of the topic of modular arithmetic. Readers are encouraged to read the materials found on these sites, play around with the applets, and reflect upon what modular arithmetic means, and how to compute within a modular system. Modular arithmetic is often called clock arithmetic. What time of the day is 5 mod 12? What do negative numbers mean, in terms of a clock?

**The Real Number System**

This study area, the Real Number System, encompasses the study of basic number systems and their properties. After finishing this subject area, you should be able to perform operations with rational numbers and recognize equivalent forms of numbers; work with powers and roots; define the irrational numbers; distinguish between number sets; demonstrate number properties in
computations and determine if properties hold for a newly defined operation on a number system; solve problems in scientific notation; apply ratios, proportions, or percents to solve problems; and demonstrate basic financial literacy. Some of this subject may be review for you. Work quickly but thoroughly as there is much material to cover.

**Topics**

**Operations With Rational Numbers and Equivalent Forms**

Within this topic, you will learn the meaning of a rational number. You will also learn how to reduce, convert between mixed numbers and improper fractions, and perform basic operations. You should become proficient at identifying and solving problems with equivalent forms of numbers, such as equivalent fractions and rationals as decimals. Record new concepts in your study notebook. What is a terminating decimal? What is a repeating decimal?

**Resources**

**Rational Numbers**

Practice MyMathLab tracked tutorial exercises for chapter 5.3 in *Thinking Mathematically*.

**Fractions**

URL: [http://www.thinkwell.com](http://www.thinkwell.com)

Watch video lectures and review notes in chapters 3-4 at Thinkwell Prealgebra Online. Practice rational number operations and changing to decimals.

**Relationship of Fractions and Decimals**

Practice MyMathLab tracked tutorial exercises for chapter 5.3 in *Thinking Mathematically*.

**Powers and Roots**

Within this topic, you will learn or refresh your knowledge on performing computations with powers and roots. This is a critical topic area for building competence in working with scientific notation as well. In your study notebook, make notes on the relationships between powers and roots. What is meant by radical? How do you express a radical as a power?

**Resources**

**Powers (Exponents)**

Review section 4.1 in *Thinking Mathematically*.

**Properties of exponents**

URL: [http://www.thinkwell.com](http://www.thinkwell.com)

Review the properties of exponents in chapter 5.6 of *Thinking Mathematically*. Watch videos and read notes from chapters 10.1.1-10.1.3 in Thinkwell Prealgebra Online.

**Roots**

Review finding roots, square roots, and other radicals. Practice MyMathLab tracked tutorial
exercises for chapter 5.4 in *Thinking Mathematically*.

**Irrational Numbers**

Within this topic, you will define irrational number. Use your study notebook to explain the difference between a rational number and an irrational number. What is meant by rationalizing a denominator? How is the Pythagorean Theorem related to irrational numbers?

**Resources**

**Irrational Numbers**

Read chapter 5.4 in *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 5.4. In the next topic area, you will include the irrational numbers as part of a diagram of the real number system.

**Defining the Real Number System**

Now that you have worked with various types of numbers, it is time to define the real number system. Within this topic, you will learn not only to define the real numbers, but also to distinguish between relationships between the natural numbers, whole numbers, integers, rational numbers, irrational numbers, and real numbers systems and subsets.

Use your study notebook to organize your thoughts. Why do we have more than one system of numbers? Consider the practical purpose of incorporating newer types of numbers to represent math ideas. Why do you think integers were created by mathematicians? Why would there be a need for rational numbers? Visit the message board and post some of your ideas of why we have these various number systems. Read and respond to the posts of your peers as well.

**Resources**

**Examining Numbers Systems**

Read chapter 5.5 of *Thinking Mathematically* to look at real number systems. Practice MyMathLab tracked tutorial exercises for chapter 5.5.

**Subsets of Real Numbers**

As a study tool, create a diagram showing the relationships within the real number system.

**Finite and Infinite Sets**

Review the definition of finite and infinite sets from chapter 2.1 (p. 54) in *Thinking Mathematically*. Review the week one topic, Set Theory.

**Number Properties**

Within this topic, you will learn the number properties (closure, associative, commutative, and distributive) and how they are applied within the real number system. What does it mean that the whole numbers are closed under addition but not under subtraction?

**Resources**
Recognizing and Applying Properties

Refer to chapter 5.5 of *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 5.5.

Connecting Terms to Concepts

When memorizing terms, it is often helpful to connect the term to the concept. Think about the terms for the number properties (closure, associative, commutative, and distributive). Do the following in your study notebook:

- Write a sentence for each describing how the term is related to the actual concept.
- Write a letter to a fictitious person who knows little about math. In your letter, explain to the person why the whole numbers are closed under addition but not under subtraction. Make sure you describe any terms or phrases that may not be understood, such as "whole numbers" and "closed under an operation."

Scientific Notation

Within this topic, you will learn how to read and interpret scientific notation and how to conduct operations using scientific notation. In your study notebook, list some applications in which it is necessary to use scientific notation. Review exponents. If you need a refresher, be sure to refer to *Thinking Mathematically* chapter 4.1 to recall the rules of operating with exponents.

Resources

Scientific Notation

Refer to chapter 5.6 of *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 5.6.

Problem Solving With Ratio, Proportion, Percent

Within this topic, you will recall or learn how to set up ratios, proportions, and percents to solve problems. If you need review on the basics of equations, review chapters 6.1-6.3 in *Thinking Mathematically*.

Resources

Ratio, Proportion, Percent

URL: [http://www.thinkwell.com](http://www.thinkwell.com)

Watch video lectures and review notes in chapter 7 at Thinkwell Prealgebra Online.

Solving Problems

Refer to chapter 6.4 of *Thinking Mathematically*. Practice MyMathLab tracked tutorial exercises for chapter 6.4.

Basic Financial Literacy

Within this topic, you will learn that many school systems are now incorporating budgeting and financial literacy programs for students in middle and high schools. Calculating sales and income tax, simple and compound interest, annuities, stocks and bonds, and installment buying are needed.
skills presented in this topic. It is anticipated that you will learn the basics of four options within a cash management system—spending, saving, investing and donating.

**Resources**

**Financial and Consumer Literacy**

Read chapter 8 in *Thinking Mathematically*. Practice tracked tutorial exercises for chapters 8.1-8.6 in MyMathLab. Keep in mind interest rates reflected in the Blitzer text are not necessary realistic in today's economy. You will want to record common formulas for interest calculations, for example, in your study notebook.

**Graph Theory**

Graph theory includes sketching graphs from data sets, recognizing patterns, and analyzing circuits, paths, networks, and other similar visual representations of data, as well as making predictions and generalizations. After finishing this subject area, you should be able to sketch a finite graph or tree given a set of points; draw conclusions from examining simple diagrams, flowcharts, paths, circuits, etc.; and predict or make conjectures based on the analysis of patterns.

**Topics**

**Reviewing Basic Charts and Diagrams**

Within this topic, you will revisit basic graph techniques for visual representation. This review will help hone your skills of analyzing data from visuals in graphs and diagrams.

**Resources**

**Revisiting Circle, Bar and Line Graphs**

Review examples of circle graphs (pie charts), bar graphs, and line graphs and their use in solving problems. See pages 16-20 in chapter 1 of *Thinking Mathematically*. This is a good time to review a news source, newspaper, magazine or online source to locate and analyze a line or bar graph.

**Venn Diagrams**

Given a Venn diagram, answer questions about data sets. See pages 67-100 in chapters 2.3-2.5 of *Thinking Mathematically*. Do the exercises in the text if you need more practice. Use your study notebook to record your work.

**Finite Graphs, Paths, Circuits, Trees**

Within this topic, you will learn how to, given a set of data, construct a finite graph that demonstrates relationships. In your study notebook you will want to answer the following: What is the definition of a finite graph? What are vertices, edges, loops? How do you recognize equivalent graphs? How does a finite graph differ from circle, bar, or line graphs? What is a path? What is the difference between a path and a circuit? How did these paths and circuits come to be named Euler and Hamilton?

**Resources**

**Finite Graphs**
Read chapter 15.1 in *Thinking Mathematically*. Record the vocabulary of graph theory in your study notebook. Answer the "Writing in Mathematics" question on page 833.

**Euler Paths and Circuits**

Work the MyMathLab tracked tutorial exercises for chapters 15.1-15.2 of *Thinking Mathematically*.

**Hamilton Paths and Circuits**

Work the MyMathLab tracked tutorial exercises for chapter 15.3 of *Thinking Mathematically*.

**Trees**

Work the MyMathLab tracked tutorial exercises for chapter 15.4 of *Thinking Mathematically*. When you complete this section, go over the chapter summary on page 864 for review of graph theory. Work the chapter review exercises if more practice is needed.

**Conclusion**

Congratulations! You have completed the entire Finite Math course of study! As you can appreciate, these are a broad range of topics that are prerequisites to further study in higher mathematics.

**Topics**

**Review of Major Points**

As you review to prepare for your next steps, note that you have covered the basics of number theory, including rounding and truncation, prime numbers and their proofs and modular operations, the real number system and its properties, an introduction to discrete mathematics which includes set theory, and logic and visual representations and interpretation of data.

For your convenience, screenshots showing the instructions for each performance task related to this course of study are available at the links below. Please note that the instructions may change slightly from time to time. For the most up-to-date instructions, evaluation rubrics, and other related material, please log in to TaskStream. You will not have access to these tasks in TaskStream until you requests them through your AAP and your mentor approves your request.

**GAT Task 1**

**Transfer and Application**

As stated in the beginning, this course of study is foundational to the rest of your mathematics program. You have reviewed basic concepts but also explored new areas of interest. The critical application from this course of study is that what you have learned here is transferable to your own classroom as a teacher. Not only have you learned content, but you have begun to explore how to connect concepts to teaching math in a middle school classroom. Within the learning resources for this course of study, you viewed many ways to directly apply the mathematical concepts to real-world situations. These real-world problem-solving strategies are areas that you can share in the classroom to spark and expand student learning.

**Next Steps**

Time to **UN-MASK**, that is, **Unleash your Motivation, Attitude, Skills and Knowledge** and
demonstrate your competence!

**Resources**

**Preassessment**

Take the preassessment for GAC1 or GAC2. This referral is available through your AAP.

1. Log in to your MyWGU Student Portal.
2. Go to the "My AAP" tab.
3. In the list below "Course Details," find the assessment you are working on.
4. In the "Assessment Preparation" column, click "Preassessment."
5. In the window that pops up, click "Click here to refer for this preassessment." A request will be sent to your mentor for approval.
6. Once your mentor has approved your request, return to the "My AAP" tab and click "Preassessment" in the "Assessment Preparation" column.
7. In the window that pops up, click "Click here to take this preassessment." You will then begin the preassessment.

This preassessment will give you a good idea of whether or not you are adequately prepared for the exam. Access the coaching report from your AAP and revisit topics here in the course of study in which you may need extra practice. The learning resources all contain additional exercises that you can practice in each topic area.

Another way to check your comprehension of topics is to start with blank paper and write down your understanding of each topic. Write it as if you were explaining it to a student. Once you have confidence in your new knowledge, you may want to speak to your mentor about whether you should take the preassessment again.

**Objective Assessment**

Once you have passed the preassessment and have confidence that you are ready for the GAC1 or GAC2 objective assessment, speak with your mentor about scheduling it.

1. Log in to your MyWGU Student Portal.
2. Go to the "My AAP" tab.
3. In the list below "Course Details," find the assessment you are working on.
4. In the "Assessment Scheduled Date" column, click "Schedule Now."
5. In the window that pops up, click "Search."
6. A new window will come up. In this window, you can either select a previously-used site or search for a different site approved by WGU. Select the site(s) by clicking on the box beside the name. This will move your selection(s) to the "Selected Sites" box.
7. Once you have selected at least one site, click "Update."
8. You will be returned to the previous window, and the site information will now be filled in. Click "Continue."
9. Enter three different potential dates with the times you can take the assessment.

    *Note: The dates must be at least two weeks from the day you refer for the assessment.*

10. Click "Continue" once your potential dates and times are filled in.
11. If there are other considerations you would like to inform the Assessment Delivery Team about, discuss them in the "Other Considerations" box that appears, and then click "Continue."
    If not, simply click "Continue."
12. A request will be sent to your mentor for approval.
13. Once your mentor has approved your request, our Assessment Delivery Team will begin scheduling your assessment at the proctor site that you submitted. Once your assessment has been scheduled, you will receive a confirmation e-mail with the date, time, and proctor site. The status on your AAP will then change to "Scheduled."

**Performance Assessment**

Talk to your mentor about being referred for GAT1 or GAT2 performance assessment through your AAP.

1. Log in to your MyWGU Student Portal.
2. Go to the "My AAP" tab.
3. In the list below "Course Details," find the assessment you are working on.
4. In the "Assessment Scheduled Date" column, click "Schedule Now."
5. A new window will come up. If there are other considerations you would like to inform the Assessment Delivery Team about, discuss them in the "Other Considerations" box that appears and then click "Continue." If not, simply click "Continue."
6. A request will be sent to your mentor for approval.
7. Once your mentor has approved your request, our Assessment Delivery Team will open the tasks required for the assessment in TaskStream. You will log in to TaskStream to receive the instructions, see the rubric, and submit your assessment for grading.

After being referred, you will be able to access the summative Finite Math task within TaskStream. You will find all directions there. While working on the task for GAT1 or GAT2, you may refer back to this course of study if you need to do so. Make sure you comprehensively address each task item in a well organized and written form. After completing your task, check that you have covered all the requirements in the rubric.

**Feedback**

To provide feedback on this or any other course of study, please use the [Course of Study Feedback form](#).

**ADA Requirements**

Please review the [University ADA policy](#).