This course supports the assessments for Pre-Calculus. The course covers 3 competencies and represents 3 competency units.

Introduction

Overview
Welcome to studies in complex numbers and trigonometry! In this course, you will learn about the complex number system, trigonometric functions, and trigonometric equations.

Competencies
This course provides guidance to help you demonstrate the following 3 competencies:

- **Competency 209.3.1: Complex Number System**
  The graduate has algebraic, geometric and polar understanding of the complex number system and can apply properties of the complex numbers to explain and justify algebraic algorithms.

- **Competency 209.3.2: Trigonometric Functions**
  The graduate understands and applies the principles of trigonometry, identifies important characteristics of trigonometric functions, and graphs them.

- **Competency 209.3.3: Trigonometric Equations**
  The graduate solves trigonometric equations and problems, and proves trigonometric identities.

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

Course Instructor Assistance
As you prepare to successfully demonstrate competency in this subject, remember that course instructors stand ready to help you reach your educational goals. As subject matter experts, mentors enjoy and take pride in helping students become reflective learners, problem solvers, and critical thinkers. Course instructors are excited to hear from you and eager to work with you.

Successful students report that working with a course instructor is the key to their success. Course instructors are able to share tips on approaches, tools, and skills that can help you apply the content you're studying. They also provide guidance in assessment preparation strategies and troubleshoot areas of deficiency. Even if things don't work out on your first try, course instructors act as a support system to guide you through the revision process. You should expect to work with course instructors for the duration of your coursework, so you are welcome to contact them as soon as you begin. Course instructors are fully committed to your success!

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.
Learning Resources
The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

Automatically Enrolled Learning Resources

VitalSource E-Texts
The following textbook is available to you as an e-text within this course. You will be directly linked to the specific readings required within the activities that follow. This e-text is available to you as part of your program tuition and fees, but you may purchase a hard copy at your own expense through a retailer of your choice. If you choose to do so, please use the ISBN listed to ensure that you receive the correct edition.


Pearson MyMathLab
When you are completing the various Quizzes, Diagnostics, and Homework, be aware that each time you work them, you will be given a slightly different set of problems. The expectation is you do each of them a few times, or even more. Before you take your next attempt, make absolutely certain that you review your work – when you do so, all of the e-texts interactive materials become available. You will be able to "View an Example," have the textbook "Help Me Solve This," watch the relevant “Videos” and “Animations” if any exist, and click straight to the textbook section needed. Reviewing a problem with these supplements will help you deepen your understanding, build your problem solving skills, and commit the skills, procedures, and concepts to memory.

Thinkwell
You will access the materials in the following Thinkwell course at the activity level within this course. This web-based resource includes multimedia video lectures, review notes, interactive animations, and sample exercises.

- Thinkwell Precalc ONLINE

Other Preparations

Graphing Calculator
Acquire a graphing calculator and familiarize yourself with how to use it. Refer to the WGU Calculator and Whiteboard Guidelines document for calculators permitted on WGU exams. If you are in a secondary mathematics program, refer to the WGU Calculator Recommendations for Secondary Math and Science Programs recommendations.pdf document for calculator suggestions for your degree program.

Pacing Guide
The pacing guide suggests a weekly structure to pace your completion of learning activities. It is provided as a suggestion and does not represent a mandatory schedule. Follow the pacing
guide carefully to complete the course in the suggested timeframe.

- Pacing Guide: Pre-Calculus

Note: This pacing guide does not replace the course. Please continue to refer to the course for a comprehensive list of the resources and activities.

Pretest and Review Material

Before you engage in this course, you may want to check your existing knowledge and understanding of this material.

Course Pretest

This course will prepare you to assess your knowledge of Precalculus material. If you have previous experience with this material, you may want to complete the course diagnostic to simulate an exam for further practice and verification of your understanding.

This topic addresses the following competencies:

- **Competency 209.3.1: Complex Number System**
  The graduate has algebraic, geometric and polar understanding of the complex number system and can apply properties of the complex numbers to explain and justify algebraic algorithms.

- **Competency 209.3.2: Trigonometric Functions**
  The graduate understands and applies the principles of trigonometry, identifies important characteristics of trigonometric functions, and graphs them.

- **Competency 209.3.3: Trigonometric Equations**
  The graduate solves trigonometric equations and problems, and proves trigonometric identities.

College Algebra Review

If you are uncertain about your mastery of College Algebra, complete the following quiz by clicking on the link below. However, if it has been a long time since you learned this material, skip this activity and instead use the smaller chunks of the course by clicking further links.

https://lrps.wgu.edu/provision/33903284

https://lrps.wgu.edu/provision/33903302

https://lrps.wgu.edu/provision/33903339

https://lrps.wgu.edu/provision/33903384

https://lrps.wgu.edu/provision/33903418

https://lrps.wgu.edu/provision/33903428
Note: If you score 50% or above on most of these quizzes, you are in reasonable shape for Precalculus. If not, you’ll probably need to do a lot of review as you move forward in Precalculus. In either case, you don’t have time to fully review College Algebra, but the degree to which Precalculus will take longer or be more challenging is indicated by how low your score is.

Course Diagnostic

If you feel you already know this material, complete the following quiz by clicking on the link below. However, if this is new material for you, or if it has been a long time since you learned this material, skip this activity and move carefully through the entire course.

https://lrps.wgu.edu/provision/33903435

Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended exercises, readings, or videos). Regardless, please read through the following activities, because there are important directions in completing work on the assessment for this course.

Trigonometric Functions

Trigonometric functions are periodic, which means that they repeat their pattern after a certain amount of distance. Consequently, they require an understanding of radian and degree measure, right triangle geometry, and the unit circle. These topics are the foundation for a clear idea of how the trigonometric functions appear graphically, as well as the important characteristics of trigonometric functions. Graphical examples of the trigonometric functions will be presented. You will explore trigonometric functions by learning their inverses. Trigonometric functions will also be shown to model periodic or oscillating phenomenon like human breath, ocean tides, and sound waves.

Trigonometric Functions Preview

Before you engage in this topic, you may want to check your existing knowledge and understanding of this material.

This topic addresses the following competencies:

- **Competency 209.3.2: Trigonometric Functions**
  The graduate understands and applies the principles of trigonometry, identifies important characteristics of trigonometric functions, and graphs them.

Trig Functions Quiz Preview

If you feel you already know this material, complete the following quiz by clicking on the link below. However, if this is new material for you, or if it has been a long time since you learned this material, skip this activity and move carefully through the following activities.

https://lrps.wgu.edu/provision/33903446

Note: If you score 70% or above on this quiz, you may feel comfortable moving through the
remaining activities at a faster pace (such as skipping some of the recommended exercises, readings, or videos). Regardless, please read through the following activities, because there are important directions in completing work on the assessment for this course.

**Trigonometric Functions, Part I**

Trigonometric graphs and trigonometric data include sine, cosine, tangent, cotangent, secant, and cosecant. Consider the following questions:

- What does each of these trigonometric functions output given the angle measure?
- What do you remember about each of these functions?
- What do you hope to learn about each of these trigonometric functions?

In your study notebook, write about the graphical similarities and differences, such as period, amplitude, range, and domain, of each trigonometric function.

This topic addresses the following competency:

- **Competency 209.3.2: Trigonometric Functions**
  The graduate understands and applies the principles of trigonometry, identifies important characteristics of trigonometric functions, and graphs them.

**Angles and Radian Measure**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- section 6.1.4 ("Converting between Degrees and Radians")

Read the following in *Algebra and Trigonometry*:

- chapter 5 - section 5.1 Angles and Radian Measure

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863259

**Right Triangle Trigonometry**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- section 6.2.2 ("Evaluating Trigonometric Functions for an Angle in a Right Triangle")

Read the following in *Algebra and Trigonometry*:

- chapter 5 - section 5.2 Right Triangle Trigonometry

To check your understanding of these concepts, complete the following:
Note: Memorize the trigonometric function values of special angles in table 5.2. Easy recall of these will allow you to focus on other aspects of problems later in this course.

**Trigonometric Functions of Any Angle**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- section 6.3.1 (“Evaluating Trigonometric Functions for an Angle in the Coordinate Plane”)

Read the following in *Algebra and Trigonometry*:

- chapter 5 - section 5.3 Trigonometric Functions of Any Angle

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863320

*Note: Memorize the trigonometric function values of special angles on the last page of the section, before the exercises. Easy recall of these will allow you to focus on other aspects of problems later in this course.*

**Trigonometric Functions of Real Numbers: Periodic Functions**

Read the following in *Algebra and Trigonometry*:

- chapter 5 - section 5.4 Trigonometric Functions of Real Numbers; Periodic Functions

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863345

**Task 1**

You now have the competency necessary to complete Precalculus Task 1.

**Task 1: Trigonometric Functions Table**

Complete the following task in TaskStream:

- Precalculus: Task 1 Trigonometric Functions Table

For details about this performance assessment, see the "Assessment" tab in this course. Be sure to check your submission against the scoring rubric before submitting your task for evaluation.

**Trigonometric Functions, Part II**

The journey into trigonometric functions will continue as you become familiar with the graphs of
trigonometric functions and their inverses and how they are applied to real-world phenomena.

This topic addresses the following competency:

- **Competency 209.3.2: Trigonometric Functions**
  The graduate understands and applies the principles of trigonometry, identifies important characteristics of trigonometric functions, and graphs them.

**Graphs of Sine and Cosine Functions**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- section 6.4.1 ("An Introduction to the Graphs of Sine and Cosine Functions")

Read the following in *Algebra and Trigonometry*:

- chapter 5 - section 5.5 Graphs of Sine and Cosine Functions

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863382

**Task 4: Modeling with Trigonometric Functions**

You now have the competency necessary to complete Precalculus Task 4. However, this task is more complicated than Task 2 even though the mathematical content for Task 2 is covered later in the course. Therefore, it is recommended that you do not complete Task 4 at this time; instead, wait until you’ve finished more of the course and completed Task 2.

Review Example 9 of section 5.5 of *Blitzer's Algebra and Trigonometry*.

Complete the following task in TaskStream:

- Precalculus: Task 4

For details about this performance assessment, see the "Assessment" tab in this course. Be sure to check your submission against the scoring rubric before submitting your task for evaluation.

**Graphs of Other Trigonometric Functions**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- section 6.6.1 ("Graphing the Tangent, Secant, Cosecant, and Cotangent Functions")

Read the following in *Algebra and Trigonometry*:
To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863401

Record in your math journal the definitions of the six basic trigonometric and circular functions. Consider similarities and differences between these six functions and record your observations. Describe the difference in the graphs as well as when the graphs intersect.

**Inverse Trigonometric Functions**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- **section 6.7.2 (“Evaluating Inverse Trigonometric Functions”)**

Read the following in *Algebra and Trigonometry*:

- **chapter 5 - section 5.7 Inverse Trigonometric Functions**

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863413

*Note: The sine function does NOT have an inverse function. This is because the sine function does not pass the horizontal test and is not one-to-one. However, you can restrict the domain of the sine function so that it is one-to-one and then find an inverse function of this restricted sine function.*

Consider the following question:

- Which of the other trigonometric functions do not have an inverse function?

**Applications of Trigonometric Functions**

Read the following in *Algebra and Trigonometry*:

- **chapter 5 - section 5.8 Applications of Trigonometric Functions**

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863423

You can to find naturally occurring trigonometric data in the world around you. Consider the following questions:

- What types of phenomenon use trigonometric functions for mathematical models?
What specifications must be given in order to build a trigonometric function?

**Trigonometric Functions Review**

You may wish to review the following material now in order to help you prepare for taking the Praxis II exam near the end of your program and to ensure you've become competent enough at this material to efficiently learn the material in the rest of this course.

This topic addresses the following competency:

**Competency 209.3.2: Trigonometric Functions**

The graduate understands and applies the principles of trigonometry, identifies important characteristics of trigonometric functions, and graphs them.

Complete the following quiz:

[https://lrps.wgu.edu/provision/33903446](https://lrps.wgu.edu/provision/33903446)

*Note: You will need to attempt this quiz multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this quiz, you will be given a slightly different set of problems. After each attempt, be sure to review your answers by going to the "Review Skills Checks", and utilize the interactive features ("Help Me Solve This," "View an Example," "Video," etc.) to help correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, review the information on those topics from above and/or get in contact with your course instructor. You may also refer to “Using Skills Checks” for information about how to appropriately use Skills Checks.*

**Analytic Trigonometry**

In the previous subject, you studied trigonometric functions. In this subject, the study of trigonometric functions is extended to formulas, identities, and equations. It is important to master the topics in the previous section before continuing.

**Trigonometric Equations and Identities Preview**

Before you engage in this topic, you may want to check your existing knowledge and understanding of this material.

This topic addresses the following competencies:

- **Competency 209.3.3: Trigonometric Equations and Identities**
  The graduate solves trigonometric equations and problems and proves trigonometric identities.

**Trig Equations & Identities Quiz Preview**

If you feel you already know this material, complete the following quiz by clicking on the link below. However, if this is new material for you, or if it has been a long time since you learned this material, skip this activity and move carefully through the following activities.
Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended exercises, readings, or videos). Regardless, please read through the following activities, because there are important directions in completing work on the assessment for this course.

**Trigonometric Equations & Identities**

In this topic you will explore some of the many relationships between the six trigonometric functions. You will need to memorize the most important relationships and learn how to use these key relationships to verify other relationships. You will also study some of the important formulas such as the sum and difference formulas.

This topic addresses the following competency:

- **Competency 209.3.3: Trigonometric Equations and Identities**
  The graduate solves trigonometric equations and problems and proves trigonometric identities.

**Trigonometric Identities**

Watch the video lectures and read the exercise examples in the following Thinkwell Precalculus sections:

- section 7.2 (“Simplifying Trigonometric Expressions”)
- section 7.3 (“Proving Trigonometric Identities”)

Read the following in *Algebra and Trigonometry*:

- chapter 6 - section 6.1 Verifying Trigonometric Identities

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863447

*Note: Memorize or be able to derive the Fundamental Trigonometric Identities listed on the first page of the section.*

**Task 2**

You now have the competency necessary to complete Precalculus Task 2.

**Task 2: Pythagorean Identities**

Complete the following task in **TaskStream**:

- Precalculus: Task 2

For details about this performance assessment, see the "Assessment" tab in this course. Be sure to check your submission against the scoring rubric before submitting your task for
evaluation.

**Task 4**

By finishing Tasks 1 and 2 first, you’ve gained the momentum to complete Task 4, which is rather more sophisticated than those other tasks. The mathematical competency required for Task 4 is covered earlier in the course than for Task 2, so you might have already completed this task, and that is fine, but not the recommended route for most students.

**Task 4: Modeling with Trigonometric Functions**

Review Example 9 of section 5.5 of *Blitzer's Algebra and Trigonometry*.

Complete the following task in TaskStream:

- Precalculus: Task 4

For details about this performance assessment, see the "Assessment" tab in this course. Be sure to check your submission against the scoring rubric before submitting your task for evaluation.

**Trigonometric Identities and Formulas, Part II**

Identities are equations that are true for any value of the variable. You will learn more identities, and then you will study trigonometric equations that are only true for specific values of the variable. By finding these values, you solve the equations. You will also learn the Law of Sines and the Law of Cosines and their applications in determining characteristics of triangles that do not contain right angles.

This topic addresses the following competency:

- **Competency 209.3.3: Trigonometric Equations and Identities**
  The graduate solves trigonometric equations and problems and proves trigonometric identities.

**Sum and Difference Formulas**

Read the following in *Algebra and Trigonometry*:

- chapter 6 - section 6.2 Sum and Difference Formulas

To check your understanding of these concepts, complete the following:

[https://lrps.wgu.edu/provision/33863492](https://lrps.wgu.edu/provision/33863492)

*Note: Memorize the table of Sum and Difference Formulas for Cosines and Sines, which appears a the beginning of Objective 2 in the section.*

**Begin Task 3**

Given the additional identity that \( i^2 = -1 \), you should be able to complete Task 3, Part B by
treat it as a trigonometric identity proof that also uses basic rules of algebra for justifying each step. The last step will use sum-of-angle identities. Do not submit the task until noted later in the instructions.

For details about this performance assessment, see the "Assessment" tab in this course.

**Double-Angle and Half-Angle Formulas**

Read the following in *Algebra and Trigonometry*:

- **chapter 6** - section 6.3 Double-Angle, Power-Reducing and Half-Angle Formulas

To check your understanding of these concepts, complete the following:

[https://lrps.wgu.edu/provision/33863534](https://lrps.wgu.edu/provision/33863534)

*Note: Memorize the double-angle formulas.*

**Continue Task 3**

Given the additional identity that $i^2 = -1$, you should be able to complete Task 3, Part A4 by treating it as a trigonometric identity proof that also uses basic rules of algebra for justifying each step. The last step will use double-angle identities. Do not submit the task until noted later in the instructions.

For details about this performance assessment, see the "Assessment" tab in this course.

**Trigonometric Equations**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- **section 7.4.1** ("Solving Trigonometric Equations")

Read the following in *Algebra and Trigonometry*:

- **chapter 6** - section 6.5 Trigonometric Equations

To check your understanding of these concepts, complete the following:

[https://lrps.wgu.edu/provision/33863546](https://lrps.wgu.edu/provision/33863546)

**Law of Sines**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- **section 8.1.1** ("The Law of Sines")

Read the following in *Algebra and Trigonometry*:
To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863571

*Note: Memorize the Law of Sines and know how to use it to solve application problems.*

**Law of Cosines**

Watch the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- section 8.2.1 ("The Law of Cosines")

Read the following in *Algebra and Trigonometry*:

- chapter 7 - section 7.2 The Law of Cosines

To check your understanding of these concepts, complete the following:

https://lrps.wgu.edu/provision/33863630

*Note: Memorize the Law of Cosines and know how to use it to solve application problems.*

**Trigonometric Equations and Identities Review**

You may wish to review the following material now in order to help you prepare for taking the Praxis II exam near the end of your program and to ensure you’ve become competent enough at this material to efficiently learn the material in the rest of this course.

This topic addresses the following competency:

- **Competency 209.3.3: Trigonometric Equations and Identities**
  The graduate solves trigonometric equations and problems and proves trigonometric identities.

Complete the following quiz:

https://lrps.wgu.edu/provision/33903472

*Note: You will need to attempt this quiz multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this quiz, you will be given a slightly different set of problems. After each attempt, be sure to review your answers by going to the "Review Skills Checks", and utilize the interactive features ("Help Me Solve This," "View an Example," "Video," etc.) to help correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling
with, review the information on those topics from above and/or get in contact with your course instructor. You may also refer to “Using Skills Checks” for information about how to appropriately use Skills Checks.

Complex Numbers

Complex numbers are an extension of the real number system. In this subject, you will briefly review the real number system and then build on this knowledge in a study of complex numbers. Complex numbers are used in many scientific fields, including engineering, electromagnetism, quantum physics, applied mathematics, and chaos theory.

Complex Numbers Preview

Before you engage in this topic, you may want to check your existing knowledge and understanding of this material.

This topic addresses the following competencies:

- **Competency 209.3.1: Complex Number System**
  The graduate has algebraic, geometric, and polar understanding of the complex number system and can apply properties of the complex numbers to explain and justify algebraic algorithms.

Complex Number System Quiz Preview

If you feel you already know this material, complete the following quiz by clicking on the link below. However, if this is new material for you, or if it has been a long time since you learned this material, skip this activity and move carefully through the following activities.

[https://lrps.wgu.edu/provision/33903478](https://lrps.wgu.edu/provision/33903478)

*Note: If you score 70% or above on this quiz, you may feel comfortable moving through the remaining activities at a faster pace (such as skipping some of the recommended exercises, readings, or videos). Regardless, please read through the following activities, because there are important directions in completing work on the assessment for this course.*

Complex Numbers

Complex numbers have many of the same properties as real numbers. Previous study of real number arithmetic operations included laws of commutativity, associativity, and distribution. You will review properties for real numbers and extend them to a study of the properties of complex numbers and operations with complex numbers. You will also learn about both rectangular and polar forms of complex numbers and the kinds of applications and computations that are best suited for each form.

This topic addresses the following competency:

- **Competency 209.3.1: Complex Number System**
  The graduate has algebraic, geometric, and polar understanding of the complex number system and can apply properties of the complex numbers to explain and justify algebraic algorithms.
Review of Real Numbers

Read the following in *Algebra and Trigonometry*, with a focus on Objectives 5 (subsets of real numbers) to 9 (properties of real numbers):

- **chapter P** - section P.1 Algebraic Expressions, Mathematical Models, and Real Numbers

To check your understanding of these concepts, complete the following:

[https://lrps.wgu.edu/provision/33863604](https://lrps.wgu.edu/provision/33863604)

**Complex Numbers**

Watch all the video lecture and read the exercise examples in the following Thinkwell Precalculus section:

- **section 1.12** (“Complex Numbers”)

Read the following section of *Algebra and Trigonometry*:

- **chapter 1** - section 1.4 Complex Numbers

To check your understanding of these concepts, complete the following:

- [WGU Precalculus: Section 1.4](#)

**History of Complex Numbers**

Review the following sections from *Dave's Short Course on Complex Numbers*:

- section 1 (“Quadratic and Cubic Equations”)
- section 2 (“The Fundamental Theorem of Algebra”)
- section 3 (“The number i”)

**Continue Task 3**

In Task 3, complete parts A1 and A2. Do not submit the task until noted later in the instructions. You should have completed parts A4 and B earlier while learning about trigonometric identities and sum-of-angle and double-angle formulas.

For details about this performance assessment, see the "Assessment" tab in this course.

**Visualizing Complex Number Addition and Subtraction**

Complex number addition can be visualized (“done without coordinates”) using tip-to-tail vector diagrams. The textbook sticks to using algebra, so to explore other ways of graphically interpreting these operations, take a look at how it is described by [Kurtz](#), by [Paramanands](#), and by [Regentsprep](#).

**Continue Task 3**
In Task 3, complete part A3a. Do not submit the task until noted later in the instructions.

For details about this performance assessment, see the "Assessment" tab in this course.

**Polar Coordinates**

Watch the Khan Academy video lecture:

- [Polar Coordinates 1](#)

Read the following in *Algebra and Trigonometry*:

- [chapter 7 - section 7.3 Polar Coordinates](#)

To check your understanding of these concepts, complete the following:

[https://lrps.wgu.edu/provision/33863643](https://lrps.wgu.edu/provision/33863643)

**Complex Numbers in Polar Form**

Watch the video lectures and read the exercise examples in the following Thinkwell Precalculus sections:

- [section 8.5 ("Complex Numbers in Trigonometric Form")](#)
- [section 8.6.1 ("Using DeMoivre's Theorem to Raise a Complex Number to a Power")](#)

Read the following in *Algebra and Trigonometry*:

- [chapter 7 - section 7.5 Complex Numbers in Polar Form; DeMoivre's Theorem](#)

To check your understanding of these concepts, complete the following:

[https://lrps.wgu.edu/provision/33863672](https://lrps.wgu.edu/provision/33863672)

**Visualizing Complex Number Multiplication and Division**

Complex number multiplication and division can be approximately visualized ("done without coordinates") using polar coordinate diagrams to observe the sizes and ratios of the angles and radii. Watch this video to help you understand this situation:

*Note: To download this video, right-click the following link and choose "Save as...": [download video](#)*

Label the diagram with the QUOTIENT for radius and the DIFFERENCE for angle, to “visually” illustrate the polar division rules. A good treatment of similar issues is located in [section 3.2](#) of *Mathematical Methods for Physics and Engineering*, by Riley, Hobson, and Bence.

Continue Task 3
In Task 3, complete part A3b. Do not submit the task until noted later in the instructions.

For details about this performance assessment, see the "Assessment" tab in this course.

**Task 3**
You now have the competency necessary to complete Precalculus Task 3.

**Task 3 Help Guide**

Read the following:

- Task 3 Help Guide

*Important: view it as a slideshow so you can click through the animations*

**Task 3: Complex Number System**

Complete the following task in TaskStream:

- Precalculus: Task 3

For details about this performance assessment, see the "Assessment" tab in this course.

Be sure to check your submission against the scoring rubric before submitting your task for evaluation.

**Complex Numbers Review**
You may wish to review the following material now in order to help you prepare for taking the Praxis II exam near the end of your program and to ensure you’ve become competent enough at this material to efficiently learn the material in future course, particularly Calculus.

This topic addresses the following competency:

- **Competency 209.3.1: Complex Number System**
  The graduate has algebraic, geometric, and polar understanding of the complex number system and can apply properties of the complex numbers to explain and justify algebraic algorithms.

Complete the following quiz:

[https://lrps.wgu.edu/provision/33903478](https://lrps.wgu.edu/provision/33903478)

**Note:** You will need to attempt this quiz multiple times under exam-like conditions for extra practice and verification of your understanding. Each time you attempt this quiz, you will be given a slightly different set of problems. After each attempt, be sure to review your answers by going to the "Review Skills Checks", and utilize the interactive features ("Help Me Solve This," "View an Example," "Video," etc.) to help correct your errors. Before moving on to the next area in this course, you should reach at least 70% on 3 attempts in a row with this quiz. If you find you are unable to meet that standard, spend time identifying which questions you are struggling with, review the information on those topics from above and/or get in contact with your course
instructor. You may also refer to "Using Skills Checks" for information about how to appropriately use Skills Checks.

Final Steps

Congratulations on completing the activities in this course! This course has prepared you to complete the assessments associated with this course. If you have not already been directed to complete the assessments, schedule and complete your assessments now.

The WGU Library

The WGU Library
The WGU Library is available online to WGU students 24 hours a day.

For more information about using the WGU Library, view the following videos on The WGU Channel:

Introducing the WGU library

*Note: To download this video, right-click the following link and choose "Save as...":* [download video]({#})

Searching the WGU library

*Note: To download this video, right-click the following link and choose "Save as...":* [download video]({#})

Center for Writing Excellence: The WGU Writing Center

If you need help with any part of the writing or revision process, contact the Center for Writing Excellence (CWE). Whatever your needs—writing anxiety, grammar, general college writing concerns, or even ESL language-related writing issues—the CWE is available to help you. The CWE offers personalized individual sessions and weekly group webinars. For an appointment, please e-mail writingcenter@wgu.edu.

Feedback

WGU values your input! If you have comments, concerns, or suggestions for improvement of this course, please submit your feedback using the following form:

- [Course Feedback](#)

ADA Policy

Western Governors University recognizes and fulfills its obligations under the Americans with
Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973 and similar state laws. Western Governors University is committed to provide reasonable accommodation(s) to qualified disabled learners in University programs and activities as is required by applicable law(s). ADA Support Services serves as the principal point of contact for students seeking accommodations and can be contacted at ADASupport@wgu.edu. Further information on WGU’s ADA policy and process can be viewed in the student handbook at the following link:

- **Policies and Procedures for Students with Disabilities**