Trigonometry
(Algebra 2 – A Technological Approach)

- Syllabus –

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Course Level: Honors

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Credits: Mathematics, 1/2

Introduction

Welcome to Trigonometry Honors. During previous years, you have studied Euclidean Geometry and Algebra as two discrete branches of mathematics. Euclidean Geometry is the study of points, lines, angles, and shapes on a plane. Algebra is the study of numbers, variables, symbols, and rules for manipulating these symbols. So, Geometry and Algebra seem to have nothing in common. The main objective of this Trigonometry Honors course is to unify Euclidean Geometry and Algebra in what is called Analytic Geometry. During this course, you will understand what a function and what the graph of a function is. That means that you will be able to "locate" points on a plane using numbers, to "describe" geometrical curves using relations between variables, and in general, to be able to "translate" geometrical objects to algebraic relations and vice versa.

Course Description

Trigonometry Honors is a Pre-Calculus course. The goal of the course is for you to master this "translation mechanism" between geometrical curves and algebraic relations. But the most important goals are for you to develop your critical thinking, imagination, mathematical intuition, and creativity in problem-solving. This course will provide you with the tools to understand why the formulas you are using work by proving each and every one of them. It will provide the tools to be able to think critically in mathematics and real life. It will provide the means for you to solve exercises by constructing a step-by-step proof, starting from the definition and the axioms, applying theorems and proven formulas, using the rules of mathematics. It will show you the way to think for yourself and come to conclusions with certainty.

Class information

Cinemath/Class Resources

Cinemath is used daily in this course. You can access the Cinemath page for this class by navigating to:

cinemath.archimedean.org ➔ *The AUC Cinemath Portal* ➔ *PreCalc* ➔ *Trigonometry M4_*

where "_" stands for the respective section (M4A, M4B, M4C, etc.)

You are expected to access it and use it regularly, as this is, in effect, the "textbook" for this class. In addition, I will occasionally upload notes to Archie, to supplement what we have covered in class. As with Cinemath, you are expected to access and use them to help deepen your understanding of the material.

Even though there is no physical textbook, there are many resources online available (mostly from college courses). Should you need resources in addition to the ones provided, let me know and I will point them to you.

Notebooks

Even though all the lecture notes are uploaded on Cinemath, you are encouraged to take notes during class. Many studies have shown that taking notes by hand helps with long-term comprehension and retention of the material.

Assessments

In this class, there are two types of assessments: oral and written.

Oral Assessments

Oral assessments will be taking place every day in class in the form of questions and answers. The questions may be about material that we have already covered in the previous classes or about material that we are currently covering (for example, problems on the board that we attempt to solve in class). Every student is expected to come prepared and work to the best of his/her abilities in the class. Your performance in class will be taken into account for your participation grade of the day.

Written Assessments

Written assessments will occur periodically, and will take the form of homework, quizzes, and exams.

Below you will find more information regarding the specific kinds of assessments.

Homework (10% of the class grade): Homework assignments are uploaded in digital form on Archie (sis.archimedean.org). Homework assignments assess your understanding of the class material and give you the chance to practice and prepare. Your solutions will be uploaded at Archie. You will be given approximately 1 homework assignment per week.

Participation (20% of the class grade): The participation grade reflects the extent to which you participate in class, as well as how well prepared you are. Every student is expected to participate in class, either by asking or answering questions. Every day, and at the end of every week, you will be given a participation grade. The week's grade consists of the average of the participation grades for each day and goes into the Gradebook. You will be given 1 participation grade per week.

Quiz (30% of the class grade): Quizzes cover recent material and are unannounced. The purpose of an unannounced quiz is to help you develop a flow in your study. This will help you perform better in major written assessments (tests) and will also make it easier to participate in class. You will be given approximately 1 quiz every 2 weeks.

Tests (40% of the class grade): Tests are cumulative, covering a wide range of material and will be given at least a week's notice. Tests are major written assessments which are (usually) given at the end or in the middle of a chapter. Tests

have questions of increasing difficulty and assess your knowledge, understanding of the material, as well as your analytical thinking. You will be given approximately 2 tests per quarter.

Final Test (2 Test grades): Upon completion of the class material, there will be a thorough review and a final test based on all the material covered during this course. The final test will have a weight of 2 test grades for the quarter in which it is going to be administered.

Correspondence between numerical and letter grades

The following correspondence between numerical and letter grades will be used throughout all your assessments, as well as your class grade.

A: > 90%

B: 80% - 89%

C: 70% - 79%

D: 60% - 69%

F: 0% - 59%

Course Content

Although improbable, the content is subject to change. Any changes will be announced in advance, in class and via email.

The course material is divided into the following 6 chapters:

Chapter 1: <u>Unit Circle Trigonometry</u>

> 1.1 Trigonometric Axes
>
> 1.2 The Six Trigonometric Ratios
>
> 1.3 Degrees to Radians Conversion
>
> 1.4 Trigonometric Table
>
> 1.5 Angle Rotations

Chapter 2: <u>Trigonometric Identities</u>

> 2.1 Fundamental Identity
>
> 2.2 Sum and Difference Formulas
>
> 2.3 Double Angle Formulas
>
> 2.4 Power Reducing Formulas
>
> 2.5 Product to Sum Formulas

Chapter 3: <u>Trigonometric Equations</u>

> 3.1 First Degree Trigonometric Equations
>
> 3.2 Quadratic Trigonometric Equations
>
> 3.3 Advanced Trigonometric Equations
>
> 3.4 Solving Trigonometric Equations on a Given Interval

Chapter 4: <u>Trigonometric Functions</u>

4.1 The Six Trigonometric Functions

4.2 Domain, Range, and Intercepts of Trigonometric Functions

4.3 The Period of Trigonometric Functions

4.4 Asymptotes of Trigonometric Functions

4.5 Limits of Trigonometric Functions

4.6 Graphs of Trigonometric Functions

Chapter 5: Inverse Trigonometric Functions

5.1 Domain, Range, and Intercepts of Inverse Trigonometric Functions

5.2 Asymptotes and Limits of Inverse Trigonometric Functions

5.3 Inverse Trigonometric Equations

5.4 Graphs of Inverse Trigonometric Functions

5.5 Geometric and Trigonometric Proofs of the Law of Sines and the Law of Cosines

Chapter 6: Polar Coordinates and Polar Curves

6.1 Polar Coordinates

6.2 Conversion from Polar to Cartesian Coordinates and Vice Versa

6.3 Polar Equations of Lines and Conic Sections

6.4 Lemniscates, Rose Curves, and Limaçons

Course Policies

All students are expected to comply with the rules, regulations and policies listed by the school which can be found in the Parent/Student Handbook. All of these policies will be enforced in class. Moreover, students must comply with the following rules and course policies:

Academic Honesty

Above all else, you are expected to respect academic honesty.

There will be severe consequences for the offense of cheating.

Any student who will be found using notes, electronic devices, communicating with classmates or by any other means try to cheat on an assessment (written or oral) will automatically get a 0 (zero) on the specific assessment without any notice and will be referred to the administration for cheating.

Furthermore, I reserve the right to deny writing a recommendation letter for summer programs and colleges or assist in any other manner students who have been found cheating.

Electronic Devices

The use of electronic devices (including but not limited to mobile phones, iPods, mp3 players, tablets, and laptops) is strictly prohibited in class. Prior permission has to be given by me in case you want to use your computer for educational purposes in class. The only electronic device that should be used during class is your iPad, and, of course, it should be used to take notes. In the unfortunate event that you are caught using an electronic device other than your iPad in class without permission, or using your iPad for purposes not pertaining to the class, the device

will be confiscated and given to the administration.

Dress code

As mentioned above, every student has to abide by school policies when in class, including the school's dress code. Furthermore, students are not allowed to wear hoods, hats and sunglasses while in class.

Tardiness - Absence

Please make sure you are in class on time. For your convenience, I have included the bell schedule in this document. I reserve the right to deny you late entry to the class unless you have the required forms from the main office or a valid note from another teacher or administrator. On time means that you are **IN** the classroom when the bell rings. If you are on campus but not in the classroom, you will be marked absent and you will have to provide a late pass. Please remember that you are responsible for any material you may miss, either because you were absent (including absences for school - sponsored events), tardy, denied entry to the class, or sent out of the class. As such, if for any reason you miss a class, please get the notes from a classmate and study the Cinemath lecture for the day you missed.

If you study the material you missed and have questions on it, please don't hesitate to ask me after school or via email. Don't wait to ask me next time in class, because we may have a quiz, and this won't be accepted as an excuse (see also **Quizzes**).

Classroom Behavior

During class, you are expected to help and promote the learning process. I will treat each student with respect, and I expect you to do the same, both to me and your classmates. You are not allowed to talk to your classmates (as this disrupts the learning process), as well as talk without first having been recognized. In case you do, your answer will not be accepted. If you want to talk, please raise your hand and I will call you. If you are disrespectful, either to me, or your classmates you will be reprimanded and/or sent out of class. Studying irrelevant material during class (including material for other classes) will result in you being sent out of class.

Eating/Drinking

You are not allowed to eat absolutely anything in the classroom. You are not allowed to chew gum or any candy during class. You are not allowed to drink any beverage except for water. Your water bottle has to be on the floor and not on your desk. If you need to drink water during class, please ask for permission to step outside, remove your mask, drink, put your mask, and come back to class.

Seating

If deemed necessary, students will be assigned seats. Please do not change seats without my permission and a subsequent update of the seating chart. Your desk should be tidy and have only your writing instruments, your notebook, and/or iPad. Your book bag should be on the floor.

Classroom

You are expected to respect the classroom and school property in general. You are not allowed to write on desks and walls, and you will be held responsible for any damage that you may cause. Unless you get prior clearance from me, you are not allowed to move desks, chairs or any other furniture. You are expected to leave the classroom clean and tidy when you leave.

Accommodations

The accommodations for students who are entitled to them will be honored.

During an in-class assessment, the student must inform me at least 20 minutes before the end of the assessment's time limit. For example, if an exam is scheduled to take 60 minutes, the student should inform me of the need for extra time by the forty-minute mark.

In the event that a student entitled to extended time necessitates it while completing a homework assignment, he/she has to inform me, in writing, before half of the time given to complete the assignment has elapsed. For example, if you are given 6 days to complete an assignment, you must inform me no later than at the end of the third day.

Homework Assignments

"Homework assignments are uploaded in digital form on Archie (sis.archimedean.org)." The solutions should be uploaded as a single file. If multiple versions/files are uploaded, only the last will be graded. If you have questions on how to upload a single file on Archie (instead of multiple versions), please ask me, a classmate, or an administrator.

I won't accept a hard copy of your solutions. No exceptions.

Your solutions should be legible, otherwise they won't be graded.

Your solutions should be uploaded to Archie, prior to 11:59:59 pm (23:59:59) on the due date. After that, your solutions will be graded as late (see also **Late Homework Turn-in**).

If the due date passes and until you turn in the homework, your grade for this will be a "z" which is equivalent to a 0 (zero). As soon as the homework is turned in and graded, you will be awarded the grade for it.

Computers and scanners have the bad tendency to break down when homework assignments are due. In this case, you have to bring a hard copy of your homework and I will sign it. This way, your homework won't be graded as late. However, keep in mind that your homework will only be graded when it's uploaded to Archie.

Your homework assignment will be graded online, and you will see your grade for this assignment in Gradebook. Normally, I will not write any notes on your solutions during the electronic grading. Should you have any questions about your grade, however, please come to me with a printed version of your homework and I will gladly discuss them with you.

You are expected to complete the homework assignments on your own, without help from your classmates or anybody else. Should you have questions on specific items on a given assignment, please ask them in class or via email. If you are found to have copied part or all the assignment from another student, it will be considered cheating (see also **Academic Honesty**).

Google translate/Translators

This class is taught entirely in Greek, and you are expected to turn in your work written in Greek. Abstain from the use of Google translate or other translators in your homework. All the vocabulary that you will need for this class is going to be

covered in the class. If you use Google translate or any other translator for your homework, this will have a negative impact on your grade for this assessment.

Late Homework Turn-in

Any homework assignment that will be uploaded to Archie after the due date is considered late. For each day that an assignment is late, 10% will be deducted from the maximum grade that you can get on this assignment. Any assignment that is turned in more than 9 days past the due date may receive a maximum score of 10%.

Quiz/Test Make-up

In case you miss a quiz or a test, you will make it up during the next class. It's your own responsibility to be prepared for it. Until you make up the assessment, your grade for this will be a "Z" which is equivalent to a 0 (zero). As soon as the make-up is graded, you will be awarded the grade for it. You will also have to provide evidence (parent/doctor's notice) for your absence. Otherwise, you may be denied the make-up and get a 0 (zero) for the assessment.

Extra Credit

Throughout the year there will be an ample number of assessments. Hence, even if you do not perform to the best of your abilities in an assessment, you will have many chances to outweigh this. Most of the quizzes and tests in this class will have extra credit questions with which you can get a higher grade than 100% in the assessment. Because of this, no other form of extra credit will be given. No exceptions.

Class Participation

"The participation grade reflects the extent to which you participate in class, as well as how well prepared you are. Every student is expected to participate in class, either by asking or answering questions. Every day, and at the end of every week, you will be given a participation grade. The week's grade consists of the average of the participation grades for each day and goes into the Gradebook." Disruptive behaviors (like talking, sleeping etc.) and behaviors leading to being asked to leave the class, will result in a participation grade of 0 (zero) for the day. You are expected to come prepared to class with your writing instruments and notebook. Coming unprepared for class will affect your participation grade for the day.

Quizzes

"Quizzes cover recent material and are unannounced." It is your responsibility to come prepared to class. No excuses will be accepted. There will be no retakes. If you are using notes, electronic devices or communicating with your classmates during a quiz, this will be considered cheating (see also **Academic Honesty**).

Tests

"Tests are cumulative, covering a wide range of material and will be given at least a week's notice." There will be no retakes. In the event that you are using notes, electronic devices or communicating with your classmates during a test, this will be considered cheating (see also **Academic Honesty**).

AUC BELL SCHEDULE

Time (From - To)	Period	Duration
8:30 - 9:20	**1st**	**50′**
9:20 - 9:24	Transition from 1st to 2nd	4′
9:24 - 10:27	**2nd**	**63′**
10:27 - 10:31	Transition from 2nd to 3rd	4′
10:31 - 11:34	**3rd**	**63′**
11:34 - 11:38	Transition from 3rd to 4th	4′
11:38 - 12:28	**4th**	**50′**
12:28 - 1:09	Lunch break	41′
1:09 - 1:13	Transition from lunch break to 5th	4′
1:13 - 2:16	**5th**	**63′**
2:16 - 2:20	Transition from 5th to 6th	4′
2:20 - 3:23	**6th**	**63′**
3:23 - 3:27	Transition from 6th to 7th	4′
3:27 - 4:30	**7th**	**63′**

COURSE AGREEMENT

Course: Trigonometry (Algebra 2 – A Technological Approach)

- I have read and understood the syllabus.

- I agree to perform to the best of my abilities in this class.

- I agree to seek extra help from my teacher when needed.

- I agree to abide by the terms and policies.

Date: _____

Class Section: _____

Name: _____

(Print)

Signature: _____

(Sign)