



Tohoku International School

Secondary School Course Syllabus

Course Title: Trigonometry and Math Analysis	Teacher: Mr. Stephen W. Messano Email: smessano@tisweb.net
Grade Level(s): Grade 11 - 12	Time Frame: 37 weeks
Course Description: <p>The key concepts in Trigonometry and Math Analysis are trigonometric functions and their applications, various forms of mathematical sequences and series, and an exploration of analytic geometry with a special emphasis on conic sections. This course explores in greater depth many of the concepts already encountered in Grade 8 Math, Algebra, and Geometry. Students who complete this course successfully should be ready to take AP Calculus or other higher math courses in college.</p> <p>This course will prepare students for success in college, and in their careers and daily lives in the 21st century. Students will develop their abilities to understand and solve mathematical problems, think critically, and communicate ideas clearly. As students explore the material presented in this course, they should begin to see the connections and applications between mathematics and the world around them.</p>	
Course Philosophy: <p>In 1802, Captain William Lambton began what is known as the Great Trigonometrical Survey of India. How was this accomplished? How can we use sine and cosine graphs to model sound waves? Have you ever noticed how a fern leaf looks like a miniature version of the fern? You can model ferns and many other natural phenomena using <i>fractals</i>, which are complex shapes based on the concept of self-similarity, an idea closely related to geometric sequences. These are the kinds of questions and ideas students will explore in this course.</p>	
Course Objectives: <p>By the end of this course, students will be able to:</p> <ul style="list-style-type: none">• Write, understand, and apply various equations, graphs, laws, and rules related to trigonometry, sequences and series, and analytic geometry (conic sections)• Determine a variety of mathematical unknowns• Apply knowledge to real-life situations• Employ various techniques for solving equations	
Units of Study: <ul style="list-style-type: none">• Trigonometric Ratios and Functions• Trigonometric Graphs and Models• Trigonometric Identities and Equations• Sequences and Series• Analytic Geometry (Conic Sections, Parametric Equations, Polar Coordinates)• Culminating Math Project	

Tohoku International School:

A community of learners preparing for life in an evolving global society

Trigonometry and Math Analysis (Cont'd)

Assessments

Project – 15%

Each student will be expected to complete a major project at the end of the school year. The project is an opportunity to show that the student can apply mathematics to an area that interests him/her. A good project should be clear and easily understood by a non-mathematician, and self-explanatory all the way through. Students will present their projects to each other in class. More detailed information, including criteria for grading, will be provided later this school year.

Quizzes (20%) & Tests (40%)

Students should expect several quizzes per unit. They will always be announced in advance. Students may use their graphing calculator and math notebook on most quizzes. When a quiz is returned to a student, s/he has the option of revising any mistakes on that quiz, re-submitting it, and receiving up to half the points missed. Students will have one week to submit revisions. At the end of each chapter or unit of study, there will be a test to assess each student's understanding. They will always be announced in advance. Students may use their graphing calculator and math notebook on most tests. When a test is returned to a student, s/he has the option of revising any mistakes on that test, re-submitting it, and receiving up to half the points missed. Students will have one week to submit revisions.

Final Exam – 15%

At the end of each semester, there will be a 90-minute exam on all of the major topics covered during that term. Students may use their graphing calculator and one page (A4 size) of handwritten notes, front and back. Their page of notes will be turned in along with their exam.

Learning Skills – 10%

Attendance, organization, homework completion and the ability to take initiative and work independently and in groups all play a role in student success and are important for achieving the course expectations.

Course Specific Materials Required

- Graphing calculator (TI-84 Plus or equivalent)
- Graph paper notebook
- Homework/handout folder
- Ruler/straightedge
- Textbooks:
 - Algebra 2, by Larson, Boswell, Kanold, and Stiff
 - Big Ideas Math: Algebra 2, by Larson and Boswell
 - Integrated Mathematics 3, by Rubenstein, Craine, and Butts
 - Precalculus with Limits: A Graphing Approach, by Larson, Hostetler, and Edwards