

Pre-Calculus

A-G Subject Area Fulfillment: Meets two semesters of the (C) Mathematics graduation requirement.

Course Overview:

This is a rigorous course designed to complete a year-long Precalculus/ Trigonometry class during our five-week summer school. Thus, the students are taught at an accelerated pace and should expect to have a minimum of one hour of homework each night. In order to be successful in this course, students need a strong background in Algebra II and a consistent work ethic. Be aware that the course is not an introduction to Precalculus/Trigonometry. If the student needs to complete just one semester of this course, you may register for just that one semester. However, there is no fee reduction. Also, if the student only needs to take the second semester, we recommend that your child attend the first semester as well to help prepare them for the second.

Course Goals and Objectives

Precalculus/Trigonometry is a wonderful course that more deeply explores and builds upon the topics learned in Geometry and Algebra II. This course is meant to be equivalent to a Precalculus course in that it will provide an adequate foundation for a future course in Calculus.

The course will cover five units

Unit 1: Sequences, Series, Exponential and logarithmic Functions

Unit 2: Functions and Their Graphs

Unit 3: Trigonometric Functions

Unit 4: Analytic Trigonometry and Trigonometric Applications

Unit 5: Conics, Parametric Equations, and Vectors

This summer course is meant to provide a low-pressure environment where individual attention by the teacher and personal reflection by the student is highly promoted. The volume of content to be learned will be intense and daunting (a full year's topics in five weeks). It is therefore the students responsibility to ask "well thought-out" questions, complete assignments, and seek tutoring, if need be.

Attendance is mandatory for learning to take place. Please be in class, and don't get behind. Please give yourself extra time to get here in the mornings; being tardy is a distraction to the class's attention.

Common Core Standards Covered
Precalculus/Trigonometry Overview [Detailed CCSS](http://www.cde.ca.gov) from www.cde.ca.gov

PRECALCULUS

Day by Day Schedule

Week 1

Day 1 – Unit 1 Sequences, Series, Exponential and Logarithmic Functions

Salutations and first day chores

Diagnostic Test

Sequences and Subscript Notation (Lesson 1-1)

Arithmetic Sequences and Series (Lesson

1-2) Homework page 17, 1 – 21

Day 2

Review Homework

Mathematical Induction (Lesson 1-3) Identifying

Geometric Sequences (Lesson 2 – 1)

Finite Geometric Sequences and Series (Lesson 2 – 2)

Infinite Geometric Sequences and Series (Lesson 2 – 3)

Exploring a Recursive Relationship (Lesson 3 – 1)

Explicit Form of a Recursive Relationship (Lesson 3 – 2)

Homework page 17, 22 – 26, page 31, 1 – 28, page 43, 1 – 21

Day 3

Review Homework

Embedded Assessment 1 – page 45

Writing an Exponential Function (Lesson 4 -1)

Compound Interest (Lesson 4 – 2)

Continuous Compounding and the Number e (Lesson 4 – 3)

Homework page 57, 1 – 28

Day 4

Review Homework

Common and Natural Logarithms (Lesson 5 – 1)

Using Properties of Logarithms and Change of Base Formula (Lesson 5 –

2) Solving Logarithmic Equations (Lesson 5 – 3)

Transformations of Functions (Lesson 6 – 1)

Function Operations (Lesson 6 – 2)

Homework page 73, 1 – 49, page 89, 1 – 35

Day 5

Review Homework

Embedded Assessment 2 - page 75

Modeling With Power Functions – Finding a Regression Line (Lesson 7 – 1)

Power Functions (Lesson 7 – 2)

Composition of Functions (Lesson 8 – 1)

Inverse Functions (Lesson 8 – 2)

Homework page 101, 1 – 34, page 113, 1 – 39

Day 6 – Unit 2 – Functions and their Graphs

Review Homework

Embedded Assessment 3 – page 115

Data and Polynomial Models (Lesson 9-1)

Polynomial Functions (Lesson 9 – 2)

Sketching Graphs of Polynomial Functions (Lesson 10 –

1) Rational Root Theorem (Lesson 10 – 2)

Descartes Law of Signs (Lesson 10 – 3)

Homework page 129, 1 – 17, page 141, 1 – 42

Day 7

Review Homework

Writing a Polynomial Function (Lesson 11 – 1)

Zeros and Complex Factors of Polynomials (Lesson 11 – 2)

Polynomial Inequalities (Lesson 11 – 3)

Writing Rational Functions (Lesson 12 – 1)

Sketching Graphs of Rational Functions (Lesson 12 –

2) Homework page 153, 1 – 39, page 165 1 – 26

Day 8

Review Homework

Embedded Assessment 4 page 155

Transformation of Rational Functions (Lesson 13 – 1)

Graphing Rational Functions (Lesson 13 – 2)

Writing a Rational Function and Rational Inequalities (Lesson 13 –

3) Homework page 181, 1 – 27

Day 9 – Unit 3 Trigonometric Functions

Review Homework

Embedded Assessment 5 –page 183

Angle Measures in Standard Position (Lesson 14 – 1)

Radian Measure (Lesson 14 – 2)

Exploring Periodic Data (Lesson 15 – 1)

Periodic Functions (Lesson 15 – 2)

Graphs and the Sine Function (Lesson 15 – 3)

Homework page 197, 1 – 24, page 212, 1-17

Day 10

Review Homework

The Unit Circle (Lesson 16 – 1)

Reciprocal Trigonometric Functions (Lesson 16 – 2)

Trigonometric Graphs and Transformations (Lesson 17 – 1)

Writing Trigonometric Functions (Lesson 17 – 2)

Homework page 223, 1 – 21, page 235, 1 – 18

Day 11

Review Homework

Graphs of Reciprocal Trigonometric Functions (Lesson 18 – 1)

Transformations of Reciprocal Trigonometric Functions (Lesson 18 – 2)

Inverse Cosine Function (Lesson 19 – 1)

Inverse Sine Function (Lesson 19 – 2)

Inverse Tangent Function (Lesson 19 – 3)

Homework page 244, 1 – 8, page 263, 1 – 19

Day 12 – Unit 3/ Begin Unit 4 Analytic Trigonometry

Review Homework

Embedded Assessment 6 (page 245)

Writing and Solving Trigonometric Equations (Lesson 20 – 1)

Reference Angles and Trigonometric Equations (Lesson 20 – 2)

Trigonometric Identities (Lesson 21 – 1)

Simplifying Trigonometric Expressions (Lesson 21 – 2)

Homework page 273, 1 – 10, page 291, 1 – 31

Day 13

Review Homework

Embedded Assessment 7 (page 175)

Cofunction Identities (Lesson 22 – 1)

Trigonometric Equations (Lesson 22 – 2)

Exploring Sums of Trig Functions (Lesson 23 – 1)

Sum and Difference Identities (Lesson 23 – 2)

Homework page 301, 1 – 32, page 317, 1 – 18

Day 14

Review Homework

Using Identities to Solve Equations (Lesson 23 – 3)

Modeling With Trigonometric Functions (Lesson 24 – 1)

1) Law of Cosines (Lesson 24 – 2)

Modeling and Applying the Law of Sines (Lesson 25 – 1)

The Ambiguous Case (Lesson 25 – 2)

Homework page 318, 19 – 31, page 329, 1 – 15, page 341, 1 – 17

Day 15 – Unit 5 Conics, Parametric Equations and Vectors

Review Homework

Embedded Assessment 1 page 319 Embedded

Assessment 2 page 343 Parabolas and Conic

Sections (Lesson 26 – 1)

Graphs and Equations of Parabolas (Lesson 26 –

2) Homework page 357, 1 – 33

Day 16

Review Homework

Ellipses (Lesson 27- 1)

Hyperbolas (Lesson 27 – 2)

Locating an Object (Lesson 27 – 3)

Homework page 375, 1 – 25

Day 17

Review Homework

The Polar Grid (Lesson 28 – 1)

Polar and Rectangular Coordinates (Lesson 28 – 2)

Polar Functions and Curves (Lesson 28 – 3)

Homework page 391, 1 – 34

Day 18

Review Homework

Polar Equations (Lesson 29 – 1)

Rectangular and Polar Form (Lesson 29 – 2)

Types of Polar Curves (Lesson 29 – 3)

Homework page 407, 1 - 38

Day 19

Review Homework

Embedded Assessment 3 page 409

Interpreting Graphical Data (Parametric Equations) Lesson

30-1 Writing Parametric Equations (Lesson 30 – 2)

Converting Parametric Equations (Lesson 30 – 3)

Homework page 423, 1 – 33

Day 20

Review Homework

Angular and Linear Velocity (Lesson 31 – 1)

Graphing and Parameterizing Data (Lesson 31 – 2)

Projectile Motion (Lesson 31 – 3)

Homework page 439, 1 – 32

Day 21

Review Homework

Embedded Assessment 4 page 441 Introduction to Vectors
(Lesson 32 – 1) Operations With Vectors (Lesson 32-2) Vector
Components (Lesson 32 – 3)

Complex Numbers and Operations (Lesson 32 – 4) Homework page 467, 1
– 40

Day 22

Review Homework

Polar Form (Lesson 32 – 5)

Rectilinear Motion (Lesson 33 – 1)

Planar Motion (Lesson 33 – 2)

Day 23

Review Homework

Embedded Assessment 5 page 481

Introduction to Limits

Techniques for Evaluating Limits

The Tangent Line Problem

Day 24

Final Review Questions

Final Exam

Final Exam Questions

Diagnostic Test

Standards of Practice

MP1. Make sense of problems and persevere in solving them MP2. Reason abstractly and quantitatively.

MP3. Construct viable arguments and critique the reasoning of others MP4. Model with Mathematics.

MP5. Use appropriate tools strategically. MP6. Attend to precision.

MP7. Look for and make use of structure.

MP8. Look for and express regularity in repeated reasoning.

Course Materials:

Textbook: Springboard Pre-calculus

Textbook will be purchased first day of class. Students will keep textbook and will be able to write and take notes in it.

Each student is to have the following materials daily:

1. Three-ring binder with appropriate pages from text inserted.
2. 3-hole punched lined, college-rule paper.

3. Stationery, such as pencils, red pens, etc.
4. Graphing calculator (Preferably the TI-84)
5. Graph paper

Course Grading

Homework, Embedded Assessments and Tests

- **Homework** is assigned daily and is due the following school day. Each assignment is worth **10 points**.
- **Embedded Assessments** – After each section (as outlined in schedule) an Embedded Assessment will be given. Each assessment will be worth **25 points**.
- A **Final** will be given after each 2 ½ week session. It will only cover the topics in that session and will be worth **100 points** each.

Homework	20%
Embedded Assessments	30%
Final Exam	20%
Quizzes	20%
Class Participation	10%
	100%

Classroom Behavior:

The student is expected to demonstrate mature, polite behavior and extend courtesy to everyone at all times:

1. Actively participate, and respectful verbal and nonverbal interaction with all opinions must be shown at all times.
2. Since differing views will be expressed, the teacher and the student(s) will mutually maintain a safe environment for courteous dialogue.
3. Respect is to be shown for all CSUN property.
4. No food or beverages will be permitted in the classroom. Snacks must be eaten outside between the designated breaks.
5. Warnings for behavior / discipline problems will be given once. Any further problems will result in a phone call to the parent(s) or guardian(s) and possible dismissal from the program.

SAEP Electronics Policy

Cell phones, music players and headphones are not permitted to be used during class hours.

- a. Please put your cell phone on silent (NOT vibrate).
- b. No texting is allowed during class.

You will be given one verbal warning if the above is not followed. Should a second warning be necessary, your cell phone, music player and/or headphones will be confiscated and held by the teacher until after class. If a third time occurs, your cell phone, music player and/or headphones will be confiscated and held in the SAEP office and **MUST BE PICKED UP BY A PARENT**.

Pre-Calculus

~~~~~  
After reading through the syllabus, please sign and date and have your student return it to class. The signature constitutes your commitment to the class as we partner to make the next five weeks a life-long educational experience for your student.

**Student/Parent Agreement:**

Please bring this signed and dated **Pre-Calculus** syllabus agreement to class tomorrow.

If you do not understand any portion of this syllabus, or if you have any questions regarding this class, please do not hesitate to email the teacher.

We have read and understand the contents of this syllabus.

Student name \_\_\_\_\_

Student signature \_\_\_\_\_

Date \_\_\_\_\_

Parent/Guardian name \_\_\_\_\_

Parent/Guardian signature \_\_\_\_\_

Date \_\_\_\_\_

Phone \_\_\_\_\_

E-mail \_\_\_\_\_