Pre-Calculus CP
Wall High School
2024-2025

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Extra Help: I will be available on Tuesdays after school in C17 for extra help. I will also be available during lunch on C days in the media center.

Marking Period Schedule

Marking Period 1 9/4/2024 - 11/6/2024	**Marking Period 3** 1/28/2025- 4/1/2025
Marking Period 2 11/11/2024 - 1/17/2025	**Marking Period 4** 4/2/2025 - 6/5/2025
Midterm Exams 1/21/2025 - 1/27/2025	**Final Exams** 6/6/2025 - 6/13/2025

Course Description

The goal of this course is to expand and reinforce the ability to understand, manipulate, and apply continuous functions in a variety of situations. By examining problems from graphical, numerical, and algebraic perspectives this course will prepare students for calculus, statistics and higher mathematics. The course focuses on function families including polynomial, rational, logarithmic, and trigonometric functions. Conic sections are another topic of study. Graphing calculator use is emphasized. The use of technology is infused to gather, analyze, and communicate mathematical information.

Units of Study

1	**Introduction to Functional Analysis**
2	**Analysis of Polynomial Functions**
3.	**Analysis of Rational Functions**
4	**Analysis of Implicitly Defined Functions**
5	**Analysis of Exponential and Logarithmic Functions**
6	**Introduction to Trigonometric Functions**
7	**Analysis of Trigonometric Functions**

Classroom Expectations

- Be on time
- Be Proactive
- Be prepared
- Cell Phones are NOT PERMITTED IN CLASS!!

Materials & Available Resources

- Binder with paper (2" is recommended)
- Pencils
- TI-84+ Calculator (Optional)

Resources:

- Google Classroom
- Deltamath.com - links directly to our google classroom when assigned

Grading Breakdown

Each quarter grade is based on a percentage model; the following grading formulas have been established.

Marking Period Category Percentages

Category	**Minimum Number**	**Percentage**
Major Assessments	2	50%
Minor Assessments	3	30%
Homework/Classwork	10	20%

Course Grading

Category	**Percentage**
Marking Period 1	20%
Marking Period 2	20%
Midterm Exam	10%
Marking Period 3	20%
Marking Period 4	20%
Final Exam	10%

Marking Period 1*

Big Ideas	Topics/Themes/Concepts	Activities & Assessments	Timeline (Number of Blocks)
Introduction to Functional Analysis	• Graphs constant, linear, absolute value, quadratic, and radical functions and their shifts, reflections and/or stretches.		**5 blocks**
	• Compute values of the domain and range graphically and analytically.		
	• Interpret graphs of functions identifying intervals of increasing, decreasing, and constant function values as well as comparing the function to F(x) = 0.		
	• Determine domain and range of a function graphically and analytically.		
	• Perform operations on functions,		**6 blocks**

	including the composition of functions numerically, graphically and analytically.		
	• Understand what it means for a function to be discontinuous and classify discontinuities as removable (point) or non-removable (jump or infinite).		
	• Classify functions as even, odd, or neither graphically and analytically.		
	• Determine if a function is a one-to-one function or not.		
	• If a function is a one-to-one function, find the inverse of a function numerically, graphically and analytically.		

Big Ideas	Topics/Themes/Concepts	Activities & Assessments	Timeline (Number of Blocks)
Analysis of Polynomial Functions	• Solve polynomial equations by factoring and make connections between the solutions and the graph of the function.		**4 blocks**
	• Solve polynomial inequalities.		
	• Understand the graphical connection between the factors of a function and the zeros of the graph, including the multiplicity of those zeros.		3 blocks
	• Sketch approximate graphs of polynomial functions using the zeros, the multiplicity of the zeros and end behavior.		
	• Review polynomial synthetic division and apply the Factor and		**6 blocks**

	Remainder Theorems for polynomial functions.		
	• Develop the Rational Root Theorem to identify all of the possible rational roots of a polynomial function.		
	• Find all roots, real and imaginary, by applying the Rational Roots Theorem of polynomial functions.		
	• Analyze polynomial functions numerically, graphically and analytically.		

Marking Period 2*

Big Ideas	Topics/Themes/Concepts	Activities & Assessments	Timeline (Number of Blocks)
Analysis of Rational Functions	• Solve rational equations and inequalities.		**4 blocks**

	• Discover graphical and analytical connections including restricted values, domain, and intercepts for rational functions.		**6 blocks**
	• Discover properties of rational functions analytically including point discontinuities and vertical asymptotes.		
	• Determine equations of horizontal and slant asymptotes of rational functions.		
	• Develop graphs of rational functions.		

Big Ideas	**Topics/Themes/Concepts**	**Activities & Assessments**	**Timeline** (Number of Blocks)
Analysis of Implicitly Defined Functions	• Derive and apply the distance formula to solve problems in the coordinate plane.		**5 blocks**

	• Analyze the symmetry of graphs of implicitly defined equations.		
	• Analyze implicitly defined equations whose graphs are circles and semi-circles.		
	• Analyze implicitly defined equations whose graphs are ellipses.		**6 blocks**
	• Analyze implicitly defined equations whose graphs are hyperbolas.		

Marking Period 3*

Big Ideas	Topics/Themes/Concepts	Activities & Assessments	Timeline (Number of Blocks)
Analysis of Exponential and Logarithmic Functions	• Use the properties of exponents to solve exponential equations by rewriting both sides of the equation as a power of the same base. Investigate graphs and		**5 blocks**

	equations of exponential functions.		
	• Classify exponential functions as growth or decay functions.		
	• Graph exponential functions, identifying horizontal asymptotes and applying shifts and/or reflections to basic functions.		
	• Define a logarithm to be the inverse of an exponential and simplify simple logarithms using basic properties.		**7 blocks**
	• Simplify complex logarithmic expressions applying all of the properties of logarithms.		
	• Develop graphs of logarithmic functions, identifying vertical asymptotes, domain, range, and		

	end behavior graphically, analytically and numerically.		
	• Solve exponential and logarithmic equations using the inverse properties of logarithms and exponentials.		**5 blocks**
	• Solve application problems involving exponential and logarithmic equations.		

Big Ideas	Topics/Themes/Concepts	Activities & Assessments	Timeline (Number of Blocks)
Introduction to Trigonometric Functions	• Understand and apply the three basic trigonometric ratios to solve right triangles and application problems.		**5 blocks**
	• Apply the Law of Sines and Law of Cosines to solve and find areas of oblique triangles		

	and application problems.		
	• Find coterminal angle(s), reference angle, and convert to radians.		**4 blocks**
	• Apply the six basic trigonometric ratios to find values for angles on the unit circle.		
	• Determine the value of the six trigonometric functions of a given angle not on the unit circle: ○ (1) knowing a point through which the terminal side of the angle passes, or ○ (2) given characteristics and constraints of the angle.		
	• Evaluate trigonometric functions of angles and solve simple trigonometric		**5 blocks**

	equations without the use of a calculator		

Big Ideas	Topics/Themes/Concepts	Activities & Assessments	Timeline (Number of Blocks)
Analysis of Trigonometric Functions	• Use the nine basic trigonometric identities to rewrite expressions in terms of a single trigonometric ratio.		**7 blocks**
	• Use the nine basic trigonometric ratios to prove that given equations are identities.		
	• Apply the trigonometric sum and difference identities.		**3 blocks**
	• Apply the double angle trigonometric identities.		
	• Solve trigonometric equations, with and without technology.		**3 blocks**

**Subject to revision*

Make-up Work as per Student Handbook

- Students who are absent from class for any reason will be required to make-up the work missed in each class. Completion of this work should take approximately the same amount of time as the student missed from class. In extreme cases of prolonged absence, (more than five consecutive days,) the Principal may grant extra time for the students to complete missing assignments. Students will receive an incomplete grade pending the submission of the missing assignments. Students will receive a zero for any work that is not completed by the designated timeline.
- It is the student's responsibility to obtain all make-up work from his/her teachers immediately upon return to school. Failure to obtain makeup work is no excuse for not completing work missed. Students have the same amount of time that they have been absent to make up the work.

Academic Integrity Policy as per Student Handbook

<u>Plagiarism Policy</u>

- **Freshmen**: On the first offense, the student may rewrite for a maximum grade of 55. The rewrite should be closely monitored by the teacher because on the freshmen level we are concerned with students' understanding of the process. On the second offense, the student receives a 0 grade for the final product. (Students' offenses will be filed in the supervisor's office.)
- **Sophomores, Juniors and Seniors:** If the teacher finds that the plagiarism is flagrant or pervasive and can document the same, the assessment may receive a grade of zero.

<u>Cheating</u>

Students are expected to conduct themselves honestly and with integrity in their work. All forms of cheating and plagiarism are prohibited. Behavior that is unacceptable includes, but is not limited to the following:

- Copying another student's work;
- Working with others on projects that are meant to be done individually;
- Looking at or copying another student's test or quiz answers;
- Allowing another student to look at or copy answers from one's test or quiz;
- Using any other method (ie "cheat sheets", communicating in any form) to get/give test or quiz answers;

- Taking a test or quiz in part or in whole to use or to give to others;
- Copying information from a source without giving proper acknowledgment;
- Taking papers from other students, publications, or internet sources and claiming it as one's own work;
- Academic dishonesty in any other form including, but not limited to, tampering with computerized grade records;
- Giving or receiving answers and/or test questions to or from another student.

Violators of this policy will be disciplined on a case-by-case basis, depending on the seriousness of the violation, prior violations and other factors.

Disciplinary measures/consequences may include, but are not limited to the following:

- Redoing the assignment (see policy on plagiarism);
- Receiving a zero grade on the project, test or quiz;
- Letter sent to parent and placed in the student's file;
- Detention, suspension or expulsion.