Algebra 2 CP 11/12
Wall High School
2024-2025

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Extra Help Schedule: I will be available on Tuesdays after school in room C17 for extra help. I will also be available on C days during unit lunch 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

This course is intended to build upon student work with linear, quadratic, and exponential functions. Students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. Through the Mathematical Practice Standards students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

Units of Study

Unit 1: Essentials of Algebra
Unit 2: Quadratic Equations, Functions, & Systems
Unit 3: Polynomial Equations & Functions
Unit 4: Exponents, Roots, & Radicals
Unit 5: Exponential and Logarithmic Functions and Equations
Unit 6: Rational Functions and Equations
Unit 7: Sequences & Series
Unit 8: Interpreting Categorical and Quantitative Data

Classroom Expectations

Classroom Norms:
- Cell phones must be kept in the pockets on the side of the classroom.
- Be respectful and supportive of everyone.
- Actively participate in class activities.
- Be prepared. (binder, good attitude, writing utensil, calculator)
- Behave in accordance with the rules of the school.
- Seek out extra help when you need it.

Learning Norms:
- **We value learning over knowing**: True learning is not about speed, memorizing procedures, or "getting done"; it is about ideas, creativity, and sense-making.
- **Collaboration moves our thinking forward**: We listen to and value each other's ideas, ask questions, push for reasons, and are open to revising our thinking.
- **We are aware of when to step up and step back**: We share our ideas and make space for others to share theirs.

Group Norms:
- **No quitting**: Challenge is normal. We can get stuck and then get ourselves unstuck.
- **No loners**: Everyone participates. No one is done until everyone is done.
- **No spoilers**: Find out what others think and don't rush to the answer. Help others do things for themselves.

Materials & Available Resources
- Mrs. Hatch's Google Classroom
- Khan Academy
- Math IXL

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	40%
Minor Assessments	6	40%
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)
Unit 1: Essentials of Algebra	- Simplify radicals when given perfect squares and non-perfect squares. - Solve multistep equations (adding, subtracting, multiplying, dividing, distributing). - Factor basic polynomials. - Use the graphing calculator to determine key values, and describe graphs of quadratics and linear functions.		**6 Blocks**

	● Calculate and interpret average rate of change of a function.		
	● Graph linear equations using concepts of slope and intercepts. ● Solve systems of linear equations using substitution, elimination and graphing.		**6 Blocks**
Unit 2: Quadratic Equations, Functions, & Systems	● Complex Numbers ● Solving Quadratics		**10 Blocks**
	● Graphing Quadratics ● Systems of Equations		**10 Blocks**
MARKING PERIOD 2			
Unit 3: Polynomial Equations & Functions	● Definitions of Polynomials ● Solving Polynomials		**9 Blocks**
	● Division of Polynomials ● Graphing Polynomials		**9 Blocks**
Unit 4: Exponents, Roots, and Radicals	● Seeing Structure in Expressions: Equivalent Forms ● Solving all types of Exponential Equations		**7 Blocks**

			7 Blocks
	● Graphing Exponential, and Radical Functions ● Applications		

Marking Period 3			
Big Ideas	**Topics/Themes/Concepts**	**Activities & Assessments**	**Timeline** (Number of Blocks)
Unit 5: Exponential and Logarithmic Functions and Equations	**Logarithms** ● Understand the inverse relationship between exponents and logarithms. ● For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base *b* is 2, 10, or *e*; evaluate the logarithm using technology. ● Write exponential functions in log form and logarithmic functions in exponential form. ● Expand and condense logarithmic expressions.		7 Blocks

	- Solve logarithmic equations with base 2, 10 or e. - Show solutions to logarithmic equations in either exact form or approximate (rounded decimals) when prompted to do so. - Check for extraneous solutions when solving logarithmic equations.		
	Graphing Logarithms - State the domain and range of logarithmic functions. - Sketch the graph of a logarithmic function, showing intercepts, key points, asymptotes, and end behavior by using technology. - Identify the effect on the graph of exponentials and logarithms replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both		**6 Blocks**

	positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.		
	Applications of Logarithms ● Apply properties of exponentials and logarithms to solve real world application problems.		1 Block
	Find inverse functions of Logarithms ● Know how to find the inverse for logarithmic function and use this to solve exponential functions. ● Solve an equation of the form $f(x) = c$ for a simple		2 Blocks

	function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$		
Unit 6: Rational Functions and Equations	• Rational Functions Rewrite simple rational expressions in different forms using inspection. • Multiply and divide rational expressions and identify extraneous solutions. • Add and subtract rational expressions and identify extraneous solutions. • Find the inverse of a rational function and identify the domain and range for the function and its inverse. • Find inverse functions.		**7 Blocks**
	• Solve simple rational equations in one variable and use them to solve problems, justify each step in the		**7 Blocks**

	process and the solution. ● Show how extraneous solutions may arise when solving a rational equation. ● Use the graphing calculator to graph rational functions using the table feature as well as identify key characteristics. ● Identify increasing and decreasing intervals as well as write the end behavior in limit notation ● Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.		
MARKING PERIOD 4			
Unit 7: Sequences and Series	**Sequences** ● Write the explicit and recursive rules for arithmetic and		**5 Blocks**

	geometric sequences.
	● Examine sequences to identify as linear or exponential.
	    ○ Students are encouraged to use the graphing calculator, if necessary, to graph the functions.
	● Examine arithmetic and geometric sequences to construct linear and exponential functions and graphs of such.
	● Write the explicit rule for a sequence given recursively and vice versa.
	● Write the recursive and explicit rules if possible for non-arithmetic or non-geometric sequences including squares, cubes, and Fibonacci.
	    ○ Recognize that sequences are functions, sometimes		

	defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.		
	Series ● Write a series with summation notation. ● Evaluate the sum of a series in summation notation. Calculate the sum of finite geometric series. ● Use the formula for the sum of a finite geometric series to solve problems. ● Estimate the rate of change from an explicit or recursive rule, graph or table.		**5 Blocks**
	Applications of Sequences and Series ● Solve real world applications using		**2 Blocks**

	sequence and series formulas		
Unit 8: Interpreting Categorical and Quantitative Data	**Summarize, represent, and interpret data on a single count or measurement variable.** ● Represent data with plots on the real number line (dot plots, histograms, and box plots). ● Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets ● Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ● Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages.		**5 Blocks**

	Recognize that there are data sets for which such a procedure is not appropriate. ● Use calculators, spreadsheets, and tables to estimate areas under the normal curve.		
	Summarize, represent, and interpret data on two categorical and quantitative variables ● Summarize categorical data for two categories in two-way frequency tables. ● Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). ● Recognize possible associations and trends in the data. ● Represent data on two quantitative variables on a scatter plot and describe how the variables are related. ○ Fit a function to the data		5 Blocks

	(including with the use of technology). ○ Use functions fitted to data to solve problems in the context of the data. ○ Use given functions or choose a function suggested by the context. Emphasize linear and exponential models. ○ Informally assess the fit of a function by plotting and analyzing residuals, including with the use of technology.		

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.