

Course Syllabus: ALGEBRA 2

Cicely Tyson Middle/High School
ALGEBRA 2
Monday through Friday
Full year
Credit hours: 5.0

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Welcome and Introduction

“Welcome to Algebra 2. My name is Ms. Aric and I will be your instructor for the year 2017/2018. Algebra II is a second-year algebra course with an overall theme of problem solving. The overriding themes of the course are: algebraic manipulation, equation solving, graphing, and probability. This Algebra II course is designed to prepare students for college level mathematics.

Course Theme / Student Expectations

You are expected to:

- ✓ Attend class daily and participate in all class activities
- ✓ Be respectful to others
- ✓ Complete all class assignments, projects, and homework
- ✓ Study and pass all tests and quizzes
- ✓ Comply with all school and district rules.

COURSE MAIN TOPICS

- Factoring
- Investigation
- Solving Equations
- Functions
- Sequences
- Exponential Functions
- Variable Exponents
- Parabolic Equations
- Systems of Equations
- Rational Expressions
- Logarithms
- Polynomials
- Complex Numbers
- Probability
- Basic Statistics

Methods of Instruction

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The course format consists of a combination of lectures, group work, student group activities, station rotations, project based learning and student interactions to help everyone achieve the course objectives.

Grading Policy

<i>Your marking period grade will be based on:</i>	<i>Your final grade will be based on:</i>	<i>Grading Scale</i>
Tests 30%		A: 90 – 100%
Quizzes 20%	1 st marking period 20%	B: 80 – 89%
Classwork 15%	2 nd marking period 20%	C: 70 – 79%
Portfolio 20%	3 rd marking period 20%	D: 65 – 69%
	4 th marking period 20%	F: 0 – 64%
Homework 15%	Midterm Exam 10%	
	Final Exam 10%	

Course Requirements and Grading

- Students are expected to enjoy the school year by working hard and getting the most out of the class. A student is considered tardy if he/she is not in his/her assigned seat by the ringing of the late bell. Students late to class may miss the Do Now assignment, which is part of your classwork/class participation grade. Students are expected to behave like young adults. Always be respectful and courteous to your fellow students and teacher. Calling out is unacceptable. I will only acknowledge students’ questions and answers if their hands are raised. Class disruptions will not be tolerated!
- Plagiarism and cheating have no place in a community of scholars. Have the confidence in yourself to give your original best. This is all that is required of you.
- Students are required to participate by coming to class on time and prepared, answering questions, taking notes, putting problems on the board, working in groups, and completing in-class assignments.
- Students will have a Do Now exercise to do every day when they enter the room. They are considered in-class assignments and are to be started immediately. Some Do Nows may be graded as quizzes.
- Homework is given almost every night. Every student is expected to complete every homework assignment with effort. I will check or collect all homework. The collected assignment will be graded. ***All work must be shown during the time I come around to check it.*** If no work is shown, a zero will be given. ***ALL HOMEWORK ASSIGNMENTS SHOULD BE WRITTEN IN PENCIL IN ORDER TO BE ACCEPTED!*** The teacher will return all work promptly with the appropriate comments (***Within 48 hours***). Please consider that thorough grading takes time. All graded work that is returned should be kept in your

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folder/binder for your records.

- Assignments will not be accepted late unless due to an excused absence. These situations are at the teacher's discretion. Students are advised to attain a phone number of a classmate in order to keep up with class work while absent.
- Students must have a 5-subject notebook or a loose-leaf binder (*Preferred*), ***for math only!*** Students must also have a folder to accompany their notebook (or hole punched into binder). It will contain all other materials, such as worksheets and tests. This syllabus is expected to be in your folders for the entire year. Also, you never know when a notebook quiz will be given. Students are expected to study! You can expect to have a test every Friday and formative assessments every day.
- ***Class ends when the teacher dismisses the class.*** Students are not to pack up before the bell without permission from the teacher.
- ***Students are not allowed to have any electronic device displayed or used in class. NO EXCEPTIONS.*** If any of these items is visible or audible, the teacher will take it. On the first offense, the item will be returned at the end of class, on the second offense, the item will be kept until the end of the school day, and on the third offense, the item will be given to administration.

Attendance and Make Up Work

Absences are recognized for the following reasons:

1. Absences to participate in official school/district activities (performances, field trips, athletic events, etc.)
2. Absences for medical reasons
3. College Visits
4. Pass indicating with Administrator/Guidance/Nurse/CST/Social Worker/Discipline
5. Passes indicating you are with another teacher must be cleared first by the period teacher if you are planning to be more than 10 min. late

If you miss class, make arrangements with me as soon as possible to arrange time for your make-up assignments. You are responsible for getting class notes from a classmate. Make-up assignments are due by the end of the class following the missed class.

Opportunities for Extra Support:

By appointment only!

How to Reach Me:

See the information on the top of this syllabus.

1st Parent/Teacher meeting: Back to school night: Date yet to be determined

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Required text/E-book/Online Resources Used

Text: *Algebra II*, Big Ideas Learning LLC
www.Bigideasmath.com

Additional Materials: Graphing calculator (Texas Instruments TI-84 will be available in class)
Binder (to organize your notes, assignments, and class work)

Pure
mathematics
is, in its way,
the poetry
of logical
ideas.

Albert Einstein

Quarterly/Unit Schedule

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Quarter/Unit I Dates: September 7th to October 31th (37 days)

• List of Topics/SLOs

- Use the Properties of operations to add, subtract, and multiply complex numbers.
- Solve quadratic equations with real coefficients that have complex solutions.
- Show that the fundamental Theorem of Algebra is true for quadratic polynomials.
- Restructure performing arithmetic operations on polynomial/rational expressions.
- Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*
- Use an appropriate factoring technique to factor expressions completely including expressions with complex numbers.
- Explain the relationship between zeros and factors of polynomials and use zeros and factors of polynomials and use zeros to construct a rough graph of the function defined by the polynomial.

Assignments/projects/Assessments

- Homework will be assigned weekly
- Major projects for the cycle not included Semester PBL
- Weekly quizzes
- Unit Assessment/Chapter Test

Quarter/Unit II Dates: November 2nd to December 22nd (31 days)

• List of Topics/SLOs

- Use properties of integer exponents to explain and convert between expressions involving radicals and rational exponents, using correct notation.
- Rewrite simple rational expressions in different forms using inspection, long division, or for more complicated examples, a computer algebra system.
- Solve simple equations in one variable and use them to solve problems, justify each step in the process and the solution and in the case of rational and radical equations show how extraneous solutions may arise.
- Solve system of linear equations and simple systems consisting of a linear and a quadratic equation in two variables, algebraically and graphically.
- Choose and produce equivalent expressions for exponential functions using properties of exponents.
- Interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*
- Use properties of exponents to rewrite a function in different but equivalent forms to identify and explain different properties of the function.
- Derive the equation of a parabola given a focus and directrix.

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Assignments/projects/Assessments

- Homework will be assigned weekly
- Major projects for the cycle not included Semester PBL
- Weekly quizzes
- Unit Assessment/Chapter Test
- Semester Project (PBL)/Midterm Exam

Quarter/Unit III Dates: January 4th to March 4th (41.5 Days)**• List of Topics/SLOs**

- Find the approximate solutions for the intersections of functions and explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ involving linear, polynomial, rational, absolute value, and exponential functions.
- Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
- Determine the inverse function for a simple function that has an inverse and write an expression for it.
- Graph functions expressed symbolically or verbally and show key features of the graph (including intercepts, intervals, where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity) by hand in simple cases and use technology for more complicated cases.
- Interpret the parameters in a linear or exponential function in terms of a context.
- Represent and describe data for two variables on a scatter plot, fit a function to the data, analyze residuals (in order to informally assess fit), and use the function to solve problems. *Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.*
- Understand the radian measure of an angle to find the length of the arc in the unit circle subtended by the angle and find the measure of the angle given the length of the arc.
- Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers (interpreted as radian measures of angles traversed counterclockwise around the unit circle) and use the Pythagorean identity $(\sin \theta)^2 + (\cos \theta)^2 = 1$ to find $\sin \theta$, $\cos \theta$, or $\tan \theta$, and the quadrant of the angle.
- Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.

Assignments/projects/Assessments

- Homework will be assigned weekly
- Major projects for the cycle not included Semester PBL
- Weekly quizzes
- Unit Assessment/Chapter Test

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Quarter/Unit IV Dates: March 7th to May 6th (38.5 Days)

• List of Topics/SLOs

- Estimate, calculate and interpret the average rate of change of a function presented symbolically, in a table, or graphically over a specified interval.
- Analyze and compare properties of two functions when each is represented in a different form (algebraically, graphically, numerically in tables, or by verbal descriptions).
- Construct a function that combines standard function types using arithmetic operations to model a relationship between two quantities.
- Identify and illustrate (using technology) an explanation of the effects on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.
- Express as a logarithm the solution to $ab^{(ct)x}$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.
- Determine if the outcomes and properties of a specified model are consistent with results from a given data-generating process using simulation.
- Identify different methods and purposes for conducting sample surveys, experiments, and observational studies and explain how randomization relates to each.
- Use the mean and standard deviation of a data set to fit it to a normal distribution, estimate population percentages, and 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).
- Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling and make inferences about population parameters based on a random sample.
- Use data from a randomized experiment to compare two treatments and use simulations to decide if differences between parameters are significant; evaluate reports based on data.

Assignments/projects/Assessments

- Homework will be assigned weekly
- Major projects for the cycle not included Semester PBL
- Weekly quizzes
- Unit Assessment/Chapter Test
- Semester Project (PBL)/Final Exam (This will follow Unit V)

Unit V (ELA and Math only) Dates: May 9th to June 17th (30.5 Days)

• List of Topics/SLOs

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- Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
- Use two-way frequency tables to determine if events are independent and to calculate/approximate conditional probability.
- Use everyday language to explain independence and conditional probability in real-world situations.
- Find the conditional probability of A given B as the fraction of B 's outcomes that also belong to A and apply the addition [$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$] rule of probability in a uniform probability model; interpret the results in terms of the model.

Assignments/projects/Assessments

- Homework will be assigned weekly
- Major projects for the cycle not included Semester PBL
- Weekly quizzes
- Unit Assessment/Chapter Test