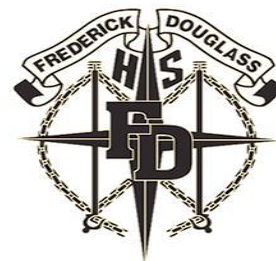


2019 COURSE SYLLABUS

Frederick Douglass High School



Teacher: Ms. Steadman

Room Number: 308

Semester: S1 and S2

Textbook: my.hrw.com

Parental Conference: Wednesday

Phone Number: 404-802-3100

Email: lxsteadman@atlanta.k12.ga.us

Tutorial Days: Wednesday

Tutorial Hours: 3:35- 4:15

Tutorial Location: Rm 308

Course Description:

Algebra II/Advanced Algebra is the culminating course in a sequence of three high school courses designed to ensure career and college readiness. It is designed to prepare students for fourth course options relevant to their career pursuits. The standards in the three-course high school sequence specify the mathematics that all students should study in order to be college and career ready. Additional mathematics content is provided in fourth credit courses and advanced courses including pre-calculus, calculus, advanced statistics, discrete mathematics, and mathematics of finance courses. High school course content standards are listed by conceptual categories including Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability. Conceptual categories portray a coherent view of high school mathematics content; a student's work with functions, for example, crosses a number of traditional course boundaries, potentially up through and including calculus. Standards for Mathematical Practice provide the foundation for instruction and assessment.

Prerequisite: Analytic Geometry

Course Content Standards:

- **Unit 1: Quadratics Revisited**

- *Perform arithmetic operations with complex numbers.*

- **MGSE9-12.N.CN.1** Understand there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ where a and b are real numbers.
- **MGSE9-12.N.CN.2** Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
- **MGSE9-12.N.CN.3** Find the conjugate of a complex number; use the conjugate to find the absolute value (modulus) and quotient of complex numbers. Use complex numbers in polynomial identities and equations.
- **MGSE9-12.N.CN.7** Solve quadratic equations with real coefficients that have complex solutions by (but not limited to) square roots, completing the square, and the quadratic formula.
- **MGSE9-12.N.CN.8** Extend polynomial identities to include factoring with complex numbers. For example, rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$. Solve equations and inequalities in one variable
- **MGSE9-12.A.REI.4** Solve quadratic equations in one variable.
- **MGSE9-12.A.REI.4b** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, factoring, completing the square, and the quadratic formula, as appropriate to the initial form of the equation (limit to real number solutions). Extend the properties of exponents to rational exponents
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- **MGSE9-12.N.RN.1** Explain how the meaning of rational exponents follows from extending the properties of integer exponents to rational numbers, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $[5^{1/3}]^3 = 5[(1/3) \times 3]$ to hold, so $[5^{1/3}]^3$ must equal 5.
 - **MGSE9-12.N.RN.2** Rewrite expressions involving radicals and rational exponents using the properties of exponents.
- **Unit 2: Operations with Polynomials**
 - **Perform arithmetic operations on polynomials.**
 - **MGSE9-12.A.APR.1** Add, subtract, and multiply polynomials; understand that polynomials form a system analogous to the integers in that they are closed under these operations.
 - **MGSE9-12.A.APR.5** Know and apply that the Binomial Theorem gives the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.
 - **Rewrite rational expressions**
 - **MGSE9-12.A.APR.6** Rewrite simple rational expressions in different forms using inspection, long division, or a computer algebra system; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$. Build a function that models a relationship between two quantities
 - **MGSE9-12.F.BF.1** Write a function that describes a relationship between two quantities.
 - **MGSE9-12.F.BF.1b** Combine standard function types using arithmetic operations in contextual situations (Adding, subtracting, and multiplying functions of different types).
 - **MGSE9-12.F.BF.1c** Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.
 - **Build new functions from existing functions**
 - **MGSE9-12.F.BF.4** Find inverse functions.
 - **MGSE9-12.F.BF.4a** Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2(x^3)$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$.
 - **MGSE9-12.F.BF.4b** Verify by composition that one function is the inverse of another.
 - **MGSE9-12.F.BF.4c** Read values of an inverse function from a graph or a table, given that the function has an inverse
- **Unit 3: Polynomial Functions**
 - **MGSE9-12.N.CN.9** Use the Fundamental Theorem of Algebra to find all roots of a polynomial equation.
 - **Interpret the structure of expressions**
 - **MGSE9-12.A.SSE.1** Interpret expressions that represent a quantity in terms of its context.
 - **MGSE9-12.A.SSE.1a** Interpret parts of an expression, such as terms, factors, and coefficients, in context.

- **MGSE9-12.A.SSE.1b** Given situations which utilize formulas or expressions with multiple terms and/or factors, interpret the meaning (in context) of individual terms or factors.
- **MGSE9-12.A.SSE.2** Use the structure of an expression to rewrite it in different equivalent forms. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
- ***Understand the relationship between zeros and factors of polynomials***
 - **MGSE9-12.A.APR.2** Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.
 - **MGSE9-12.A.APR.3** Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
- ***Use polynomial identities to solve problems***
 - **MGSE9-12.A.APR.4** Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.
- ***Interpret functions that arise in applications in terms of the context***
 - **MGSE9-12.F.IF.4** Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- ***Analyze functions using different representations***
 - **MGSE9-12.F.IF.7** Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.
 - **MGSE9-12.F.IF.7c** Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
- **Unit 4: Rational & Radical Relationships**
 - ***Rewrite rational expressions***
 - **MGSE9-12.A.APR.7** Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
 - ***Create equations that describe numbers or relationships***
 - **MGSE9-12.A.CED.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, simple rational, and exponential functions (integer inputs only).
 - **MGSE9-12.A.CED.2** Create linear, quadratic, and exponential equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (Limit to rational and radical functions. The phrase “in two or more variables” refers to formulas like the compound interest formula, in which $A = P(1 + r/n)^{nt}$ has multiple variables.)
 - ***Understand solving equations as a process of reasoning and explain the reasoning***
 - **MGSE9-12.A.REI.2** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
 - **MGSE9-12.F.IF.4** Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two

quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

○ ***Interpret functions that arise in applications in terms of the context***

- **MGSE9-12.F.IF.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

○ ***Analyze functions using different representations***

- **MGSE9-12.F.IF.7** Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.
- **MGSE9-12.F.IF.7b** Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- **MGSE9-12.F.IF.7d** Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

● **Unit 5: Exponential and Logarithms**

○ ***Write expressions in equivalent forms to solve problems***

- **MGSE9-12.A.SSE.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- **MGSE9-12.A.SSE.3c** Use the properties of exponents to transform expressions for exponential functions. For example, the expression $1.15t$, where t is in years, can be rewritten as $[1.15(1/12)](12t) \approx 1.012(12t)$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.

○ ***Analyze functions using different representations***

- **MGSE9-12.F.IF.7** Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.
- **MGSE9-12.F.IF.7e** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
- **MGSE9-12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- **MGSE9-12.F.IF.8b** Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)t$, $y = (0.97)t$, $y = (1.01)(12t)$, $y = (1.2)(t/10)$, and classify them as representing exponential growth and decay.

○ ***Build new functions from existing functions***

- **MGSE9-12.F.BF.5** Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. Construct and compare linear, quadratic, and exponential models and solve problems
- **MGSE9-12.F.LE.4** 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.

● **Unit 6: Mathematical Modeling**

○ ***Write expressions in equivalent forms to solve problems***

- **MGSE9-12.A.SSE.4** 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.
- **MGSE9-12.A.CED.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, simple rational, and exponential functions (integer inputs only).
- **MGSE9-12.A.CED.2** Create linear, quadratic, and exponential equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (The phrase “in two or more variables” refers to formulas like the compound interest formula, in which $A = P(1 + r/n)^{nt}$ has multiple variables.)
- **MGSE9-12.A.CED.3** Represent constraints by equations or inequalities, and by systems of equation and/or inequalities, and interpret data points as possible (i.e. a solution) or not possible (i.e. a non-solution) under the established constraints.
- **MGSE9-12.A.CED.4** Rearrange formulas to highlight a quantity of interest using the same reasoning as in solving equations. Examples: Rearrange Ohm’s law $V = IR$ to highlight resistance R ; Rearrange area of a circle formula $A = \pi r^2$ to highlight the radius r .
- ***Represent and solve equations and inequalities graphically***
 - **MGSE9-12.A.REI.11** Using graphs, tables, or successive approximations, show that the solution to the equation $f(x) = g(x)$ is the x -value where the y -values of $f(x)$ and $g(x)$ are the same.
- ***Interpret functions that arise in applications in terms of the context***
 - **MGSE9-12.F.IF.6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
 - **MGSE9-12.F.IF.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one function and an algebraic expression for another, say which has the larger maximum.
- ***Build new functions from existing functions***
 - **MGSE9-12.F.BF.3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both 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.
- **Unit 7: Inference and Conclusions from Data**
 - ***Summarize, represent, and interpret data on a single count or measurement variable***
 - **MGSE9-12.S.ID.2** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, mean absolute deviation, standard deviation) of two or more different data sets.
 - **MGSE9-12.S.ID.4** Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. 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. Understand and evaluate random processes underlying statistical experiments
 - **MGSE9-12.S.IC.1** Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

- **MGSE9-12.S.IC.2** Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?
- ***Make inferences and justify conclusions from sample surveys, experiments, and observational studies***
 - **MGSE9-12.S.IC.3** Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
 - **MGSE9-12.S.IC.4** 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.
 - **MGSE9-12.S.IC.5** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
 - **MGSE9-12.S.IC.6** Evaluate reports based on data. For example, determining quantitative or categorical data; collection methods; biases or flaws in data.

Course Outline:

Week 1:	Quadratics Revisited
Week 2:	Quadratics Revisited
Week 3:	Operations w/ Polynomials
Week 4:	Operations w/ Polynomials
Week 5:	Polynomial Functions
Week 6:	Polynomial Functions
Week 7:	Polynomial Functions
Week 8:	Rational and Radical Relationships
Week 9:	Rational and Radical Relationships
Week 10:	Rational and Radical Relationships
Week 11:	Exponential and Logarithms
Week 12:	Exponential and Logarithms
Week 13:	Exponential and Logarithms
Week 14:	Mathematical Modeling
Week 15:	Mathematical Modeling
Week 16:	Inference and Conclusions from Data
Week 17:	Inference and Conclusions from Data
Week 18:	Review, Remediation, Flex, Extension

Evaluation and Grading:

Course Components	Weights	
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Learning Skills (interactive notebook and executive function skills including, timely assignment completion, organization, sustained attention)	5%	Grading Scale	
		100-90	A
		89-80	B
		79-70	C
Classwork and Participation	40%	69-0	F
Homework	5%	Not Evaluated	NE
Lesson Quizzes	20%		
Unit Tests (or Performances)/Projects	30%		
TOTAL	100%		

Campus Portal for Parents and Guardians: Visit <https://ic.apsk12.org/portal> to view class schedules, attendance records and grades. To activate your account, visit the school to receive your login (activation key).

Required Materials:

Pen
Pencil
Paper
OneNote/ Google Classroom/ and www.hrw.com
Calculator (recommended) Ti-83, 84, 32

Classroom Expectations:

Class notes: You will be expected to take detailed notes during each class lesson. These class notes will help you when completing your class work, homework, and when studying for tests. The expectation is that by the end of the fiscal school year each student will have a guide and reference for the End of Course testing and a skill refresher for the next math course. OneNote Checks will be a part of the Quiz category and will be frequently checked with at least a 1 week notice.

Assignments: Students will receive an assignment daily of various types. Both class and homework assignments will be collected at the end of the week. These assignments will count in your “Daily classwork and or homework” sections of your grade.

Quizzes: Throughout the course, we will have short quizzes over whatever topic we are covering at that time. Expect them to be both cumulative and single subject quizzes. (Multi choice, short answer, writing prompts, and application task.)

Tests: At the end of each unit, students will be administered a cumulative assessment. These assessments will be taken by all students.

Make-up work: When work is missed due to an excused absence, all missed assignments are due within one week of your return. It is your responsibility to find out what you missed and get assignments to me in a timely fashion.

Make-up Test: When a test is missed due to an excused absence, the test must be made up within one week of your return. All make-up work, including tests, is the responsibility of the student. If you are

ever unhappy with a teacher-generated test, please see me. Ask for extra practice, remediation and help. Once these things are complete, you may attempt a different version of the test on which you were not successful. Please complete any retakes within a month of non-success! Test will be averaged for 1 combined grade.

Attendance/Tardy Policy: See Student Handbook/School policy

“House Rules”

- Always be on time and prepared to learn.
- Passes will not be issued during first or last 10 minutes of class.
- Hats, hoods, headbands, and/or head garments of any kind are not to be worn in the school building.
- Electronic devices, including phones, iPods, ear buds, etc., are not permitted during the school day. All electronic devices must remain turned off and out of sight or they may be confiscated. Confiscated items will only be returned to legal parent/guardian.
- Please stay in your class and in your seat until the bell rings.
- Thank you for assisting in keeping our high school clean by picking up around your area and throwing your trash away. This is particularly vital in the cafeteria area.
- **No food or drink in class whatsoever** (Except Water)

Discipline Protocol (*Refer to Student Handbook for Details*)

Minor misconduct (level one offenses – such as excessive non subject talking, insubordination, etc.) will follow below plan:

- 1st Offense: Warning
- 2nd Offense: Teacher-Student Conference
- 3rd Offense: Detention, Behavior Analysis Assignment, and Parent Conference
- 4th Offense: Discipline Referral

Major offenses will receive an automatic discipline referral.

Course Expectations

Behavior: Each student should:

1. Be in your seat, ready to begin when the bell rings.
2. Have a pencil, paper, notebook, textbook, and homework out/submitted at the beginning of class working on the question of the day.
3. Be respectful and cooperative to the teacher and classmates.
4. Follow all school rules stated in the school handbook.

LATE ASSIGNMENTS: It is important that students are responsible and meet established due dates for assignments. Late is defined as anytime work is submitted after the assignment has already been collected by the teacher.

FDHS MAKE-UP AND MISSING ASSIGNMENTS STATEMENT:

Students are expected to make up work missed while they were absent. When an absence occurs, it is the student's responsibility to retrieve and/or complete any assignment(s) from the teacher's Google Classroom. Students will be given full credit for work done that satisfies the conditions of the district policy for make-up work.

FDHS Academic Integrity Statement:

Academic dishonesty is the failure to maintain academic integrity. Academic Statement: dishonesty includes but is not limited to: cheating, (using or attempting to use unauthorized materials, information, or study aids in any academic exercise); fabrication, (falsification or invention of any information or citation in an academic exercise); bribery offered for grades, transcripts, or diplomas; obtaining or giving aid on an examination; having unauthorized prior knowledge of an examination; doing work for another student, presenting another student's work as one's own; and plagiarism.

FDHS Recovery Plan:

Students whose numerical grades drop below 70 may recover their grade through the use of assignments provided by the teacher utilizing one of the following approved platforms: Edgenuity, USA Test Prep, MyHRW, KhanAcademy, IXL, Apex, and TenMarks.

ATHLETIC ELIGIBILITY: Students wanting to participate in athletic programs governed by the GHSA and extracurricular activities must meet eligibility requirements to participate. The Athletic Director (and the Extracurricular Activities sponsors) will collaborate with teachers to monitor and to identify students in danger of failing courses. All faculty members will be given a master list of students participating in extracurricular activities and athletics under the auspices of the GHSA.

Resources:

- Recommendations
 - www.tenmarks.com Daily
 - www.apexvs.com Daily
 - www.ck12.org Daily
 - www.desmos.com Daily
 - www.khanacademy.org Daily
 - www.remind.com Daily
 - www.connected.mcgraw-hill.com

Student Signature and Date _____

Parent-Guardian Signature and Date _____

Parent-Email Signature _____

**GSE Advanced Algebra II
Ms. Steadman**

Acknowledgement of receipt

To parent(s) and the student:

By signing and dating below you have confirmed that you have received a copy of the course syllabus for GSE Advanced Algebra II for the 2019 school year. You have also agreed upon and understood all course rules, conditions, and policies.

Note to Parents: Please pay special attention to the **materials list** to ensure your child the best possible chance for success in this class. I believe in open communication between parents, teachers, and students, and I believe this plays a vital role in ensuring the success of your child. If you ever have any questions or concerns please feel free to contact me. The best method of contact is via e-mail: lxsteadman@aps.k12.org. You may keep up with your child's assignments and upcoming assessments by visiting my website (accessible through the Douglass website or using the address provided). I truly believe that every child has the ability to learn and do well in math, and I will do everything in my power to help each student reach his or her full potential in this class. I am looking forward to a great semester!

Students are encouraged to study and maintain an interactive student notebook for future reference. Students, as well as, parents and guardians are encouraged to visit the state website for a detailed list of objectives and indicators of mastery www.doe.k12.ga.us. Please go to www.khanacademy.org for extended practice, teacher will issue usernames and passwords.

Student Signature and Date

Parent-Guardian Signature and Date

Parent Only!

Email Address _____

Work Phone: _____

Cell Number _____

****Please star your preferred method of contact!**

Is there anything that you want me to know about your student that will help him or her to be more successful in my class?

