Cosby High School

Part 1: Course Information

Instructor Information

Course: Algebra 2
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Remind:

Course Description

Algebra 2 is a challenging and essential high school mathematics course that builds upon the foundational concepts introduced in Algebra 1 and Geometry. This course delves deeper into algebraic structures and functions, preparing students for higher-level mathematics. Emphasis is placed on developing strong problem-solving skills, critical thinking, and the ability to model real-world phenomena using algebraic techniques.

Prerequisite

- Algebra 1 and Geometry

General Education/High School Pathway Area

- General Education

Textbook & Course Materials

Required Text

- *enVision Algebra 2*

Additional Resources:

- Lined paper
- Pencils
- 1 Spiral Bound Notebook or composition book for a math journal
- 1 Folder

Course Requirements

- none

Part 2: Student Learning Outcomes

Standard A2.N.RN.A.1 (Major) Explain how the definition of the meaning of rational exponents follows from extending the properties

of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents

Standard A2.N.RN.A.2 (Major) Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Standard A2.N.Q.A.1 (Supporting) Identify, interpret, and justify appropriate quantities for the purpose of descriptive MODELING .

Standard A2.N.CN.A.1 (Supporting) Know there is a complex number ii such that $ii2 = – 1$, and every complex number has the form $aa + bbbb$ with aa and bb real.

Standard A2.N.CN.A.2 (Supporting) Know and use the relation i 2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

Standard A2.N.CN.B.3 (Supporting) Solve quadratic equations with real coefficients that have complex solutions

Standard A2.A.SSE.A.1 (Major) Use the structure of an expression to identify ways to rewrite it

Standard A2.A.SSE.B.2 (Major) Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. A2.A.SSE.B.2a Use the properties of exponents to rewrite exponential expressions

Standard A2.A.SSE.B.3 (Major) Recognize a finite geometric series (when the common ratio is not 1), and use the sum formula to solve problems in context.

Standard A2.A.APR.A.1 (Major) 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).

Standard A2.A.APR.A.2 (Major) 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.

Standard A2.A.APR.B.3 (Supporting) Know and use polynomial identities to describe numerical relationships.

Standard A2.A.APR.C.4 (Supporting) Rewrite rational expressions in different forms.

Standard A2.A.CED.A.1 (Major) Create equations and inequalities in one variable and use them to solve problems.

Standard A2.A.CED.A.2 (Major) Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Standard A2.A.REI.A.1 (Major) Explain each step in solving an equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Standard A2.A.REI.A.2 (Major) Solve rational and radical equations in one variable, and identify extraneous solutions when they exist.

Standard A2.A.REI.B.3 (Supporting) Solve quadratic equations and inequalities in one variable. **A2.A.REI.B.3a** Solve quadratic equations by inspection(e.g., for x2 = 49), taking square roots, completing the square, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.

Standard A2.A.REI.C.4 (Supporting) Write and solve a system of linear equations in context.

A2.A.REI.C.5 (Supporting) Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.

Standard A2.A.REI.D.6 (Major) 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); find the approximate solutions using technology.

Standard A2.F.IF.A.1 (Major) For a function that models a relationship between two quantities, 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.

Standard A2.F.IF.A.2 (Major) 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.

Standard A2.F.IF.B.3 (Supporting) Graph functions expressed symbolically and show key features of the graph, by hand and using technology. **A2.F.IF.B.3a** Graph square root, cube root, and piecewise defined functions, including step functions and absolute value functions. **A2.F.IF.B.3b** Graph polynomial functions, identifying zeros when suitable factorizations are available and showing end behavior. **A2.F.IF.B.3c** Graph exponential and logarithmic functions, showing intercepts and end behavior.

Standard A2.F.IF.B.4 (Supporting) Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **A2.F.IF.B.4a** Know and use the properties of exponents to interpret expressions for exponential functions.

Standard A2.F.IF.B.5 (Supporting) Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Standard A2.F.BF.A.1 (Major Work of the Grade) Write a function that describes a relationship between two quantities. **A2.F.BF.A.1a** Determine an explicit expression, a recursive process, or steps for calculation from a context. **A2.F.BF.A.1b** Combine standard function types using arithmetic operations.

Standard A2.F.BF.A.2 (Major) Write arithmetic and geometric sequences with an explicit formula and use them to model situations.

Standard A2.F.BF.B.3 (Supporting) Identify the effect on the graph of replacing $ff(xx)$ by $ff(xx) + kk$, $kk\,ff(xx)$, $ff(kkkk)$, and $ff(xx + kk)$ for specific values of kk (both positive and negative); find the value

Standard A2.F.BF.B.4 (Supporting) Find inverse functions. A2.F.BF.B.4a Find the inverse of a function when the given function is one-to-one.

Standard A2.F.LE.A.1 (Supporting) Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or inputoutput pairs.

Standard A2.F.LE.A.2 (Supporting) 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

Standard A2.F.LE.B.3 (Supporting) Interpret the parameters in a linear or exponential function in terms of a context

Standard A2.F.TF.A.1 (Supporting) Understand and use radian measure of an angle. **A2.F.TF.A.1a** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. **A2.F.TF.A.1b** Use the unit circle to find sin θ, cos θ, and tan θ when θ is a commonly recognized angle between 0 and 2$\pi\pi$.

Standard A2.F.TF.A.2 (Supporting) 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.

Standard A2.F.TF.B.3 (Supporting) Know and use trigonometric identities to find values of trig functions. **A2.F.TF.B.3a** Given a point on a circle centered at the origin, recognize and use the right triangle ratio definitions of sin θ, cos θ, and tan θ to evaluate the trigonometric functions. **A2.F.TF.B.3b** Given the quadrant of the angle, use the identity sin2 θ + cos2 θ = 1 to find sin θ given cos θ, or vice versa.

Standard A2.S.ID.A.1 (Supporting) Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages using the Empirical Rule.

Standard A2.S.ID.B.2 (Supporting) Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. **A2.S.ID.B.2a** Fit a function to the data; 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.

Standard A2.S.IC.A.1 (Major) Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

Standard A2.S.IC.A.2 (Major) Use data from a sample survey to estimate a population mean or proportion; use a given margin of error to solve a problem in context.

Standard A2.S.CP.A.1 (Supporting) 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”).

Standard A2.S.CP.A.2 (Supporting) Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

Standard A2.S.CP.A.3 (Supporting) Know and understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

Standard A2.S.CP.A.4 (Supporting) Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.

Standard A2.S.CP.B.5 (Supporting) Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A and interpret the answer in terms of the model.

Standard A2.S.CP.B.6 (Supporting) Know and apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.

Course Structure

Methods: Lecture, notes, class discussion, group work, bookwork, quizzes, and tests.

Assessment Methods:

Chapter tests: A test will be given at the end of each chapter.

EOC: The geometry end of course exam will be given at the end of the semester.

Part 3: Topic Outline/Schedule

Semester 1: Predicted time frame

Test 1 - August 27
Test 2 - September 10
Test 3 - September 19
Test 4 - October 3
Test 5 - October 22
Test 6 - October 31
Test 7 - November 13
Test 8 - November 24
Test 9 - December 10
Semester project due December 18
Test 10 - January 14
Test 11 - January 23
Test 12 - February 4
Test 13 - February 12
Test 14 - February 26
Test 15 - March 11
Test 16 - March 19
Test 17 - March 27
EOC review until EOC testing is finished
Semester Project due May 19

These dates are approximate and may change due to weather or students' needs.

Part 4: Assessments and Grading Policy

Graded Course Assignments

Grading Scale (NEW FOR 2022-2023)

90-100 = A; 80-89 = B; 70-79 = C; 60-69 = D; 0-59 = F

***Disclaimer: Assignments may change at any time.

Grades for assignments that are turned in on time will generally be entered into ASPEN within 5 days of being tuned in and returned to the student.

Late Work Policy

You will lose 2 points per day if the assignment is late. Once grades are in for the first 9 weeks, you will not be able to turn in assignments due the first 9 weeks.

Final Exam Policy

As daily attendance at school is critical for academic success, Cosby High School has added an incentive to the academic program to reward individual daily attendance.

- All **non-EOC teachers** are required to administer a comprehensive final exam that assesses the mastery of standards taught throughout the semester.
- **EOC teachers** are required to administer a graded quiz or test during the final exam blocks on the dates listed above. EOC quick scores are used in the final exam column and weighted as the final exam. The graded quiz or test will be averaged with the 4th nine weeks grades.
- Exams are given on the last two days of both semesters. The grades on these exams will count 15% of the overall course average.

School Year 2025-2026
Midterms December 18 and 19
May 15 and 18
EOC testing window April 13 - May 5

(In the spring, exam dates for seniors are adjusted to allow time to average

grades for graduation.)

ALL students in grades 9-12 have an opportunity to earn exemption on the final exam in non-EOC courses and/or final quiz/test given in the EOC courses. Teachers will follow the following guidelines in determining student exam exemption:

- The student has missed no more than 3 days (excused or unexcused) in the semester prior to the first day of finals.
- Absences for a school related activity (field trip, CTE program, athletic competition, etc.) does not count as an absence.
- The student is passing the class prior to the exams.

The student who qualifies for exam exemption may opt to take the exam on a no-harm basis. If the exam grade lowers the class average, then the exam grade will not count.

Teachers will administer tests in all courses and for all students except for those students who qualify for and accept the exemption.

Part 5: Course Policies

Makeup Work

Students are responsible for absent work. You have 5 days to turn in work when you are absent. The makeup work will be in the absent work folder on the shelf in the classroom.

Classroom Rules and Expectations

Be prepared and in your seat before the bell rings. (Pencil sharpened calculator and book ready, etc.)

Remain in seats until the bell rings. No clumping at the door.

When the intercom comes on, be still and quiet

Follow the school's hall pass policy

Stay with class during drills

Respect others, their property and the classroom. (the smart board and white board is off limits without permission)

Sit only at the student desks/tables

The intercom, phone, and the thermostat box are for teacher use only.

NO CELL PHONES IN USE DURING CLASS

Academic Dishonesty Policy

Academic Dishonesty Policy

People learn most effectively and build their strength of character by doing their reading, writing, test-taking, projects, research, and assignments. Students learn most from their education by evaluating, reflecting, and revising their work. Therefore, educating students about academic honesty and clarifying the school's policy on academic dishonesty.

Definitions of cheating and plagiarism:

Cheating

Cheating is the unauthorized possession, giving, sharing, taking, or presentation of information and material benefits to a student.
Examples of cheating include but are not limited to

- the passing of information during an assessment,
- having access to and utilizing unauthorized material and technology during an assessment,
- passing information about an exam from one class to another, and
- submitting work that is not one's own.

Plagiarism

According to the Harbrace Handbook, the 15th edition:

- Plagiarism is defined as “presenting someone else’s ideas, research, or opinions as your own without proper documentation, even if it has been rephrased.”
- This includes, but is not limited to:
  - Copying verbatim all or part of another’s written work;
  - Using phrases, figures, or illustrations without citing the source;
  - Paraphrasing ideas, conclusions, or research without citing the source;
  - Using all or part of a literary plot, poem, or film without attributing the work to the creator.
- Consequences of Plagiarism
  - Plagiarism is a form of stealing and academic fraud. Students who are found guilty of plagiarism have the option of redoing the assignment within a specified period and

accepting a letter drop or taking a zero on the assignment. Parents are to be involved in making the decision.

Artificial Intelligence

Artificial Intelligence (AI) programs, as defined by state law, may be used by staff and students in the district.

Academic Integrity

Students shall be instructed on responsible use standards, including but not limited to the following:

1. Effective use of generative AI;
2. When it is appropriate to use AI in assignments;
3. How to determine whether AI responses are accurate;
4. Users assume responsibility for incorporating AI content responsibly; and
5. The difference between cheating and seeking support.

Religion in the Classroom

The Board affirms that is is essential that the teaching about religion - and not of a religion be conducted in a factual, objective, and respectful manner in accordance with the following guidelines:

1. Religious themes may be a part of the curriculum for school-sponsored activities and programs provided it is essential to the learning experience in the various fields of study and is presented objectively;

2. The inclusion of religion shall be for educational purposes only;1

3. The emphasis on religious themes should be only as extensive as necessary for a balanced and comprehensive study of the curriculum. Such studies shall never be used to proselytize, establish, foster, or demean any particular religion, religious tenets, or beliefs; and1

4. Student-initiated expressions to questions or assignments which reflect their beliefs or non-beliefs about a religious theme shall be accommodated.