Advanced Algebraic Concepts 2024-2025

Course Information

Instructor: Chris Walters
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Extra Help Hours: 7-7:30 AM and 2 – 3 PM

Textbook: Illustrative Mathematics
Online Resources: im.kendallhunt.com
Class website: http://www.everettsd.org/jhs-cwalters
All instructional materials can be accessed through Canvas

Course Description

The third year of high school mathematics asks students to pull together and apply the learning that they have from years 1 and 2. They apply methods from probability and statistics to draw inferences and conclusions from data. Students expand their repertoire of functions to include polynomial, rational, and radical functions. They expand their study of right triangle trigonometry to include general triangles. And, finally, students bring together all their experience with functions and geometry to create models and solve contextual problems.

Learning Outcomes

- Know 5 general functions: Polynomial, Rational, Exponential, Logarithmic, Trigonometric
- Analyze functions using domain, range, intercepts, end behavior, symmetry, asymptotes, vertex, line of symmetry, amplitude, period, and phase shifts
- Sketch graphs of functions and their transformations with and without technology
- Solve equations numerically, algebraically, and graphically:
  polynomials, rational, radical, exponential, logarithm and trigonometric (radians)
- Compute with complex numbers: addition, subtraction, and multiplication
- Write recursive definitions and explicit formulas using function notation
- Find values for arithmetic/geometric sequences
- Analyze data using normal distributions, histograms, and margin of error
- Make and justify conclusions based on data.
- Model various situations using sequences and functions (polynomials, exponential, logarithmic and trigonometric)
- Apply mathematical practices:
  1. Make sense of problems and persevere in solving them.
  2. Reason abstractly and quantitatively.
  3. Construct viable arguments and critique the reasoning of others.
  4. Model with mathematics.
  5. Use appropriate tools strategically.
  6. Attend to precision.
  7. Look for and make use of structure.
  8. Look for and express regularity in repeated reasoning

Course Outline

1. Sequences and Functions
2A. Polynomials Functions
2B. Rational Functions
3. Complex Numbers and Rational Exponents
4A. Exponential Functions and Equations
4B. Logarithmic Functions and Equations
5. Transformations of Functions
6A. Trigonometric Functions: Unit Circle & Sine Graph
6B. Trigonometric Functions: Sinusoids
7. Statistical Inferences

Grades:

Classwork/Assignment: 20% Unit Tests and Projects: 80%

Letter Grade	A	A –	B +	B	B –	C +	C	C –	D +	D	F
Percent	100-93	92-90	89-87	86-83	82-80	79-77	76-73	72-70	69-67	66-60	59-0

Our mission is to provide a rigorous curriculum that sets high standards and prepares all students for the future.

Classroom Policies & Expectations

Grading Policy

Mathematical Explanation required for all problems: (may include the following but is not limited to)

- Algebraic steps or verbal explanations
- Graphs, tables, or pictures that are clearly labeled.
- Calculator entries, when using a calculator.
- Correct standard mathematical notation.
- Decimal answers should be accurate to 3 places.
- Final answers can be equivalent to those provided

You can learn mathematics, but it won't happen by itself. You will have to work at it!

1. Participate in class.
2. Take and review your notes each day.
3. Attempt all problems assigned.
4. If you don't know, do as much as you can.
5. Ask questions when you don't understand.
6. Come in for additional help when you first start to struggle.

Classwork/Assignments:

- Expect daily assignments to practice the concepts.
- Assignments are due at the beginning of the next class, where time will be given to review answers.
- Assignments will earn 1 point for each problem
- Students are responsible for self-correcting and asking questions when they don't understand
- Late assignments will be accepted until unit test with a 15% reduction in score.
- Excused absences will have 1 week grace period before late penalty is applied

Assessments (weighted to 100 points):

- Mix of calculator and non-calculator questions
- All tests must be completed on the day they are started
- Typical scoring of questions
  - Multiple Choice questions: 2 points each
  - Short answer questions: 5 points each
    - Correct Solution (2 points)
    - Mathematical Explanation (3 points)
- If you are absent the day before a test, you will still be expected to take the test.

Test Correction Privileges:

- Students who are absent (unexcused) on the day of the test will lose the privilege to correct that test.
- Student must complete test corrections before the next unit test.
- Corrections will earn back ½ the points missed up to a max score of 85%.
- Must be completed in the classroom but not during class time unless all required daily work is complete.

Extra Credit Opportunity:

- Bonus percentage points will be added to each unit assessment for the unit's assignments.
- No violations of electronic device behavior expectations during unit.
- Overall assignment score of 97% or higher earns 3% bonus on unit assessment, 87% or higher earns 2% and 77% or higher earns 1%

Behavior Expectations

- All school wide and district policies as described in the Student Handbook will be enforced.
- Students are expected to be respectful towards their peers, teacher, and the classroom.
- A 5 minute hall pass will allow one student out of the room at a time. A legible log will be kept.
- **No Electronic Devices** (cell phone, headphones, etc.) will be allowed during class, except a calculator and a district issued device or equivalent without permission from the teacher.
- Drinks are allowed if the bottle has a closable lid (spill proof).
- Food is **not** permitted, unless required for medical reasons.

Materials

- Textbooks will be provided.
- Folder and paper to keep additional notes and/or worksheets
- Scientific calculator required. A graphing calculator, such as the TI-83+ or TI-84 is highly recommended and is required for AP courses.