**Algebra 2 Honors Curriculum Guide 2025-2026**

**Reorganized Function-Based Approach**

**School:** Doral Academy  
**Teacher:** Mrs. Zogovic

This curriculum follows a systematic function-based approach where each function family is explored through four key components: **solving equations, solving inequalities, analyzing graphs and properties, and real-world applications**.

**CURRICULUM PHILOSOPHY: THE FOUR-PILLAR FUNCTION APPROACH**

For each function family, students will master:

1. **SOLVE EQUATIONS** - Algebraic techniques for finding solutions
2. **SOLVE INEQUALITIES** - Graphical and algebraic methods for inequality solutions
3. **ANALYZE GRAPHS** - Properties, transformations, domain, range, and end behavior
4. **APPLICATIONS** - Real-world modeling and problem-solving

**PRIMARY RESOURCES**

**FlippedMath Algebra 2 Common Core** -- <https://algebra2cc.flippedmath.com/>  
**FlippedMath AP Precalculus** -- <https://precalculus.flippedmath.com/ap-precalc.html>  
**Khan Academy Algebra 2** -- <https://www.khanacademy.org/math/algebra2>  
**Khan Academy Trigonometry** -- <https://www.khanacademy.org/math/trigonometry>

**Note:** (PRC) indicates material from AP Precalculus for enhanced depth and rigor

**QUARTER 1: Aug 14 - Oct 17**

**Foundation Functions: Linear, Quadratic, and Polynomial**

| **Week** | **Dates** | **Major Concepts/Topics** | **Four-Pillar Focus** | **Holiday/Special Notes** | **Resources** |
| --- | --- | --- | --- | --- | --- |
| **1** | Aug 14-16 | **Unit 1: Linear Functions Review** • Function notation • Domain and range basics | **Graphs:** Linear transformations and families | Short week - School starts | [FlippedMath 5.1-5.2 Transformations](https://algebra2cc.flippedmath.com/) |
| **2** | Aug 19-23 | **Linear Functions (4-Pillar Approach)** • Linear equations • Linear inequalities | **Equations & Inequalities:** Systems and graphical solutions |  | [Khan Academy: Linear Functions](https://www.khanacademy.org/math/algebra2) |
| **3** | Aug 26-30 | • Linear graphs, slopes, transformations • Linear modeling applications | **Graphs & Applications:** Rate of change and real-world contexts |  | [Professor Leonard: Linear Functions](https://www.youtube.com/c/ProfessorLeonard) |
| **4** | Sep 2-6 | **Unit 2: Quadratic Functions** • Solving quadratic equations (factoring, square root, quadratic formula) | **Equations:** Multiple solution methods | **Labor Day - Sep 2** | [FlippedMath 6.3 Quadratic Formula](https://algebra2cc.flippedmath.com/) |
| **5** | Sep 9-13 | • Quadratic inequalities (graphical and algebraic) • Sign analysis | **Inequalities:** Parabola regions and test points |  | [Khan Academy: Quadratic Inequalities](https://www.khanacademy.org/math/algebra2) |
| **6** | Sep 16-20 | • Quadratic graphs: vertex form, axis of symmetry, transformations | **Graphs:** Vertex, intercepts, end behavior | **Interims Issued - Sep 16** | [Desmos: Quadratic Explorer](https://www.desmos.com/calculator) |
| **7** | Sep 23-27 | • Quadratic applications: projectile motion, optimization, area problems | **Applications:** Real-world modeling |  | [Khan Academy: Quadratic Models](https://www.khanacademy.org/math/algebra2) |
| **8** | Sep 30-Oct 4 | **Unit 3: Polynomial Functions** • 🔍 Polynomial equations and factoring techniques | **Equations:** Advanced factoring, synthetic division |  | [FlippedMath 1.1-1.4 Polynomials](https://algebra2cc.flippedmath.com/) |
| **9** | Oct 7-11 | • Polynomial inequalities using sign charts | **Inequalities:** Critical points and interval testing |  | [Khan Academy: Polynomial Inequalities](https://www.khanacademy.org/math/algebra2) |
| **10** | Oct 14-17 | • Polynomial graphs: end behavior, zeros, multiplicity • Polynomial modeling | **Graphs & Applications:** Complete analysis | **Quarter 1 Ends Oct 17** | [Professor Leonard: Polynomial Graphs](https://www.youtube.com/c/ProfessorLeonard) |

**QUARTER 2: Oct 20 - Jan 15**

**Exponential, Logarithmic, and Operations Review**

| **Week** | **Dates** | **Major Concepts/Topics** | **Four-Pillar Focus** | **Holiday/Special Notes** | **Resources** |
| --- | --- | --- | --- | --- | --- |
| **11** | Oct 20-24 | **Unit 4: Exponential Functions** • Exponential equations | **Equations:** Properties of exponents, change of base | **Teacher Planning Day - Oct 20** | [FlippedMath 7.1-7.2 Exponentials](https://algebra2cc.flippedmath.com/) |
| **12** | Oct 27-31 | • Exponential inequalities • Growth vs. decay analysis | **Inequalities:** Exponential comparisons | **Report Cards - Oct 28** | [Khan Academy: Exponential Models](https://www.khanacademy.org/math/algebra2) |
| **13** | Nov 3-7 | • Exponential graphs: transformations, asymptotes, domain/range | **Graphs:** Complete function analysis |  | [Desmos: Exponential Functions](https://www.desmos.com/calculator) |
| **14** | Nov 10-14 | • Exponential applications: compound interest, population growth, decay | **Applications:** Financial mathematics and real-world modeling | **Veterans Day - Nov 11** | [Khan Academy: Financial Literacy](https://www.khanacademy.org/college-careers-more/financial-literacy) |
| **15** | Nov 17-21 | **Unit 5: Logarithmic Functions** • Logarithmic equations and properties | **Equations:** Log properties, change of base, solving techniques | **Interims Issued - Nov 18** | [FlippedMath 8.1-8.4 Logarithms](https://algebra2cc.flippedmath.com/) |
| **16** | Nov 24-28 | • Logarithmic inequalities | **Inequalities:** Log function behavior | **Thanksgiving Break** | [Khan Academy: Logarithmic Functions](https://www.khanacademy.org/math/algebra2) |
| **17** | Dec 1-5 | • Logarithmic graphs: inverse relationship, transformations, asymptotes | **Graphs:** Domain restrictions and inverse properties |  | [Professor Leonard: Logarithms](https://www.youtube.com/c/ProfessorLeonard) |
| **18** | Dec 8-12 | • Logarithmic applications: pH, decibels, earthquake magnitude | **Applications:** Scientific and real-world contexts | **Early Release Day - Dec 10** | [Khan Academy: Log Applications](https://www.khanacademy.org/math/algebra2) |
| **19** | Dec 15-19 | **Semester Review & Final Exam** | **All Four Pillars:** Comprehensive integration | **Final Exams Week** | Comprehensive review materials |
| **Winter Break** | Dec 22-Jan 6 | **Winter Break** |  | **No School** |  |
| **20** | Jan 7-10 | **Operations Review: Polynomial Division** • Long division • Synthetic division | **Equations:** Division algorithms for polynomial equations |  | [FlippedMath 1.3 Polynomial Division](https://algebra2cc.flippedmath.com/) |
| **21** | Jan 13-15 | **Complex Numbers** • Operations with complex numbers • Complex solutions | **Equations:** Complex solutions to quadratic and polynomial equations | **Quarter 2 Ends Jan 15** | [Khan Academy: Complex Numbers](https://www.khanacademy.org/math/algebra2) |

**QUARTER 3: Jan 20 - Apr 2**

**Rational Functions and Trigonometric Functions**

| **Week** | **Dates** | **Major Concepts/Topics** | **Four-Pillar Focus** | **Holiday/Special Notes** | **Resources** |
| --- | --- | --- | --- | --- | --- |
| **22** | Jan 20-24 | **Unit 6: Rational Functions** • Simplifying rational expressions • Operations with rational expressions | **Foundation:** Building blocks for rational functions | **MLK Day - Jan 20** | [FlippedMath 3.1-3.3 Rational Expressions](https://algebra2cc.flippedmath.com/) |
| **23** | Jan 27-31 | • Complex fractions • Domain and range of rational expressions | **Graphs:** Domain restrictions and discontinuities |  | [Khan Academy: Rational Expressions](https://www.khanacademy.org/math/algebra2) |
| **24** | Feb 3-7 | • Rational equations (LCD method, cross multiplication) | **Equations:** Solving techniques and extraneous solutions |  | [Professor Leonard: Rational Equations](https://www.youtube.com/c/ProfessorLeonard) |
| **25** | Feb 10-14 | • Rational inequalities (sign analysis, critical points) | **Inequalities:** Test intervals and boundary behavior | **Early Release Day - Feb 11** | [Khan Academy: Rational Inequalities](https://www.khanacademy.org/math/algebra2) |
| **26** | Feb 17-21 | • Rational function graphs: vertical/horizontal/oblique asymptotes, holes | **Graphs:** Complete asymptotic analysis | **Presidents Day - Feb 17** | [Desmos: Rational Function Explorer](https://www.desmos.com/calculator) |
| **27** | Feb 24-28 | • Rational function applications: rates, work problems, optimization | **Applications:** Real-world rational modeling |  | [Khan Academy: Rational Models](https://www.khanacademy.org/math/algebra2) |
| **28** | Mar 3-7 | **Unit 7: Trigonometric Functions - Introduction** • Unit circle • Radian/degree conversion | **Foundation:** Building trigonometric understanding |  | [Khan Academy: Unit Circle](https://www.khanacademy.org/math/trigonometry) |
| **29** | Mar 10-14 | • Basic trigonometric equations (sin, cos, tan) | **Equations:** Unit circle solutions | **Teacher Planning Day - Mar 12** | [FlippedMath Trigonometry](https://precalculus.flippedmath.com/) |
| **30** | Mar 17-21 | • Trigonometric inequalities | **Inequalities:** Periodic solutions and intervals |  | [Khan Academy: Trig Equations](https://www.khanacademy.org/math/trigonometry) |
| **Spring Break** | Mar 24-28 | **Spring Break** |  | **No School** |  |
| **31** | Mar 31-Apr 2 | • Trigonometric graphs: amplitude, period, phase shift, vertical shift | **Graphs:** Complete periodic function analysis | **Quarter 3 Ends Apr 2** | [Desmos: Trig Function Explorer](https://www.desmos.com/calculator) |

**QUARTER 4: Apr 6 - Jun 5**

**Advanced Trigonometry and Integration**

| **Week** | **Dates** | **Major Concepts/Topics** | **Four-Pillar Focus** | **Holiday/Special Notes** | **Resources** |
| --- | --- | --- | --- | --- | --- |
| **32** | Apr 6-10 | **Unit 7: Trigonometric Functions (Continued)** • Trigonometric applications: periodic phenomena, waves | **Applications:** Real-world periodic modeling |  | [Khan Academy: Trig Applications](https://www.khanacademy.org/math/trigonometry) |
| **33** | Apr 13-17 | **Unit 8: Trigonometric Identities** • Fundamental identities • Pythagorean identities | **Equations:** Identity verification and simplification | **Early Release Day - Apr 15** | [Professor Leonard: Trig Identities](https://www.youtube.com/c/ProfessorLeonard) |
| **34** | Apr 20-24 | • Sum and difference formulas • Double angle and half angle formulas | **Equations:** Advanced trigonometric equations | **Spring Holiday - Apr 21** | [Khan Academy: Trig Identities](https://www.khanacademy.org/math/trigonometry) |
| **35** | Apr 27-May 1 | **Unit 9: Advanced Equations and Systems** • Systems with trigonometric functions | **Equations:** Integration of function families | **Interims Issued - Apr 28** | [FlippedMath Systems](https://algebra2cc.flippedmath.com/) |
| **36** | May 4-8 | • Parametric equations (PRC) • Polar coordinates (PRC) | **Graphs:** Alternative coordinate systems |  | [AP Precalculus: Parametric](https://precalculus.flippedmath.com/) |
| **37** | May 11-15 | **Unit 10: Function Analysis and Modeling** • Comparing function families | **All Four Pillars:** Comprehensive function comparison |  | [Khan Academy: Function Comparison](https://www.khanacademy.org/math/algebra2) |
| **38** | May 18-22 | • Advanced modeling projects • Function composition and inverse functions | **Applications:** Real-world mathematical modeling |  | Student choice modeling projects |
| **39** | May 25-29 | **Statistics Integration** • Normal distributions • Probability applications | **Applications:** Statistical modeling and analysis | **Memorial Day - May 26** | [Khan Academy: Statistics](https://www.khanacademy.org/math/statistics-probability) |
| **40** | Jun 2-5 | **Final Projects & Course Wrap-up** • Portfolio presentations • Course reflection | **All Four Pillars:** Comprehensive integration | **Early Release Days Jun 2-4** **Quarter 4 Ends Jun 5** | Final project presentations |

**FUNCTION FAMILY LEARNING SEQUENCE**

**For Each Function Family, Students Will:**

**SOLVE EQUATIONS**

* Master algebraic techniques specific to each function type
* Use appropriate tools (factoring, quadratic formula, properties, etc.)
* Check for extraneous solutions
* Solve systems involving the function

**SOLVE INEQUALITIES**

* Apply graphical methods (test points, boundary analysis)
* Use algebraic methods (sign charts, critical points)
* Interpret solutions in interval notation
* Consider domain restrictions

**ANALYZE GRAPHS**

* Identify key features (intercepts, asymptotes, extrema)
* Analyze transformations and families
* Determine domain and range
* Describe end behavior and continuity

**APPLICATIONS**

* Model real-world situations
* Interpret mathematical results in context
* Optimize solutions for practical problems
* Connect to other disciplines (physics, economics, etc.)

**ASSESSMENT STRATEGY BY FUNCTION FAMILY**

**Four-Pillar Assessment Rubric**

**Mastery Level (4):** Demonstrates complete understanding across all four pillars

**Proficient Level (3):** Shows solid understanding with minor gaps

**Developing Level (2):** Basic understanding with some misconceptions

**Beginning Level (1):** Limited understanding requiring significant support

**TECHNOLOGY INTEGRATION FOR FOUR-PILLAR APPROACH**

**EQUATION SOLVING TOOLS**

* [Symbolab Step-by-Step Solutions](https://www.symbolab.com/)
* [Wolfram Alpha Problem Solver](https://www.wolframalpha.com/)
* TI-84 Calculator techniques

**INEQUALITY ANALYSIS TOOLS**

* [Desmos Graphing Calculator](https://www.desmos.com/calculator)
* [GeoGebra Inequality Explorer](https://www.geogebra.org/)
* Sign chart generators

**GRAPH ANALYSIS TOOLS**

* [Desmos Function Transformations](https://www.desmos.com/calculator)
* [GeoGebra Function Families](https://www.geogebra.org/)
* [FlippedMath Interactive Graphs](https://algebra2cc.flippedmath.com/)

**APPLICATION MODELING TOOLS**

* [Khan Academy Real-World Problems](https://www.khanacademy.org/math/algebra2)
* [Desmos Activity Builder](https://teacher.desmos.com/)
* Statistical analysis software

**RATIONAL FUNCTIONS: COMPREHENSIVE OPERATIONS REVIEW**

**BEFORE RATIONAL FUNCTIONS - ESSENTIAL SKILLS REVIEW:**

1. **Polynomial Long Division**
   * Step-by-step algorithm
   * Applications to simplifying rational expressions
   * Connection to synthetic division
2. **Synthetic Division**
   * When and how to use
   * Finding zeros and factors
   * Remainder theorem applications
3. **Complex Fractions**
   * Simplification techniques
   * LCD method vs. division method
   * Applications in rational expressions
4. **Domain and Range Analysis**
   * Identifying restrictions
   * Vertical asymptotes vs. holes
   * Horizontal and oblique asymptotes

**TRIGONOMETRY INTEGRATION STRATEGY**

**TRIGONOMETRIC FUNCTIONS FOUR-PILLAR APPROACH:**

**TRIGONOMETRIC EQUATIONS:**

* Basic equations using unit circle
* Multiple angle solutions
* Identity applications
* Inverse trigonometric functions

**TRIGONOMETRIC INEQUALITIES:**

* Periodic solution sets
* Graphical interpretation
* Interval notation with periods

**TRIGONOMETRIC GRAPHS:**

* Amplitude, period, phase shift, vertical shift
* Transformations of parent functions
* Domain and range considerations
* Asymptotic behavior (for tan, cot, sec, csc)

**TRIGONOMETRIC APPLICATIONS:**

* Periodic phenomena (sound waves, tides, seasons)
* Right triangle applications
* Law of sines and cosines
* Harmonic motion modeling

**PRECALCULUS PREPARATION (PRC) TOPICS**

**ADVANCED TOPICS FOR COLLEGE READINESS:**

* **Parametric Equations** - Alternative function representations
* **Polar Coordinates** - Circular coordinate systems
* **Vectors and Matrices** - Linear algebra foundations
* **Advanced Function Composition** - Composite function analysis
* **Sequence and Series** - Discrete mathematics connections
* **Mathematical Modeling** - Real-world problem solving

**CONTACT INFORMATION & SUPPORT**

**Mrs. Kristina Zogovic**  
**Email:** kzogovic@doralacademy.org  
**Office Hours:** Daily 7:15-7:45 AM and 3:15-4:00 PM  
**Course Website:** [Link](https://gamma.app/docs/Algebra-2-Honors-Curriculum-Guide-2025-2026-fnl6s9bzkto5o8k?mode=doc)

**Student Support Resources:**

* **FlippedMath Videos:** 24/7 access to instructional content
* **Khan Academy Practice:** Personalized learning with immediate feedback
* **Peer Tutoring:** NHS Honor Society mathematics support
* **Parent Communication:** Regular progress updates and resource sharing
* **Office Hours:** Individual and small group assistance

*This reorganized curriculum follows a systematic four-pillar approach to function families, ensuring students develop comprehensive understanding through equations, inequalities, graphs, and applications. The integration of trigonometry and advanced operations provides strong preparation for AP Precalculus and college-level mathematics.*