



2019-20

# CALVERT HOMESCHOOL™ CURRICULUM CATALOG

## Coordinate Algebra



---

## Table of Contents

<b>COORDINATE ALGEBRA COURSE OVERVIEW</b> .....	<b>1</b>
UNIT 1: RELATIONSHIPS BETWEEN QUANTITIES.....	1
UNIT 2: REASONING WITH EQUATIONS AND INEQUALITIES.....	2
UNIT 3: LINEAR AND EXPONENTIAL FUNCTIONS.....	2
UNIT 4: SEMESTER 1 EXAM.....	2
UNIT 5: DESCRIBING DATA.....	2
UNIT 6: TRANSFORMATIONS IN THE COORDINATE PLANE.....	3
UNIT 7: CONNECTING ALGEBRA AND GEOMETRY THROUGH COORDINATES.....	3
UNIT 8: SEMESTER 2 EXAM.....	3
UNIT 9: SEMESTER 2 EXAM.....	3

## Coordinate Algebra Course Overview

Coordinate Algebra is a full-year mathematics course intended for high school students who have successfully completed general mathematics for grade 8 or pre-algebra. This course focuses on complex operations of integers and variables while incorporating algebraic techniques and methods in order to develop student understanding of mathematical expressions, and concepts involving linear, quadratic, exponential and polynomial functions. Coordinate Algebra also integrates statistical theory with computational practices as well as to include coordinate geometry and geometric concepts, theorems and skills. Students are exposed to several branches of mathematics and will explore ways in which each one can be used as a mathematical model in understanding the world.

- **Relationships between Quantities:** Student will use the rule of exponents to simplify products, write equations of direct variation, find the distance between two points, and factor polynomials in various ways.
- **Reasoning with Equations and Inequalities:** Student will solve equations containing rational expressions and proportions, calculate slopes of lines in various manors, and write equations of a line given different pieces of information.
- **Linear and Exponential Functions:** Student will identify sets of data as functions or inverse functions, and graph them, evaluate perimeters, areas, volumes, and linear expressions, as well as identify an arithmetic or geometric sequence, find the common difference or ratio, and extend it to the nth term.
- **Describing Data:** Student will find the central tendencies of data, construct and interpret different plots of data, and calculate numbers of permutations or combinations of sets of data.
- **Transformations in the Coordinate Plane:** Student will identify different types of angles, analyze relationships between parallel lines and a transversal, and what happens to images after a translation, rotation, or reflection.
- **Connecting Algebra and Geometry through Coordinates:** Student will solve for the slope of the sides and diagonals of geometric figures, classify quadrilaterals using various manors, and find the areas of geometric figures.

Unit 1: Relationships Between Quantities	
Assignments	
1. Course Overview	18. Distance
2. Expressions	19. Applications of Percents
3. Multiplication and Raising to a Power	20. Mixture and Interest Problems
4. Division	21. Quiz 4
5. Expressions and Operations	22. F.O.I.L. and Special Cases
6. Quiz 1	23. Factoring Out the GCF
7. Evaluating Expressions and Absolute Value	24. Factoring Trinomials
8. Variables and Expressions	25. Complete Factorization
9. Algebraic Expressions, Equations and Inequalities	26. Quiz 5
10. Equations with Multiple Operations	27. Simplifying Rational Expressions
11. Quiz 2	28. Adding and Subtracting with Unlike Denominators
12. Two Unknowns, More Than Two Unknowns	29. Project: Work Word Problems
13. Real World Applications	30. Project: Regularity in Repeated Activity
14. Writing Equations from Word Problems	31. Review
15. Quiz 3	32. Test
16. Direct Variation	33. Alternate Test - Form A*
17. Literal Equations	

Unit 2: Reasoning With Equations and Inequalities	
Assignments	
Coordinate Algebra	1. Solving Equations with Rational Expressions
	2. More Operations with Rational Expressions
	3. Quiz 1
	4. Inequalities
	5. Compound Inequality Graphs
	6. Problem Solving
	7. Quiz 2
	8. Slope Review
	9. Linear Equations
	10. Slope-Intercept Form
	11. Inequalities with Two Variables
	12. Quiz 3
	13. Writing Linear Equations: Slope-Intercept and General Form
14. Writing Linear Equations with Given Points	
15. Parallel and Perpendicular Lines	
16. Quiz 4: Writing Linear Equations	
17. Graphing Systems of Equations	
18. Systems of Inequalities	
19. Quiz 5: Solving Linear Systems by Graphing	
20. Substitution Method	
21. Addition Method	
22. Using Formulas	
23. Project: Horizontal and Vertical Lines	
24. Project: Modeling Income	
25. Review	
26. Test	
27. Alternate Test - Form A*	

Unit 3: Linear and Exponential Functions	
Assignments	
Coordinate Algebra	1. Identifying Functions
	2. Function Notation
	3. Relations and Functions: Inverses
	4. Modeling Functions
	5. Quiz 1
	6. Evaluating Formula Functions
	7. Writing a Function Rule
	8. Arithmetic Sequences
	9. Quiz 2
10. Project: Applications of Sequences	
11. Geometric Sequences	
12. Exponential Functions	
13. Graphing Exponential Functions	
14. Quiz 3	
15. Project: Community Beautifying Project	
16. Review	
17. Test	
18. Alternate Test - Form A*	

Unit 4: Semester 1 Exam	
Assignments	
1. Exam	2. Alternate Exam*

Unit 5: Describing Data	
Assignments	
Coordinate Algebra	1. Statistics: Mean, Median, and Mode
	2. Range, Interquartile Range, Outliers, and Box and Whiskers Plots
	3. Standard Deviation and Variance
	4. Quiz 1
	5. Bar Graph, Dot Plot, and Stem and Leaf Plot
	6. The Histograms
	7. Correlation and Scatterplots
	8. Project: Creating a Graph
	9. Dispersion
	10. Two-Way Frequency Table
11. Project: Data Analysis	
12. Quiz 2	
13. Sampling and Outcomes	
14. Permutations	
15. Combinations	
16. Probability	
17. Project: Probability	
18. Quiz 3	
19. Review	
20. Test	
21. Alternate Test - Form A*	

Unit 6: Transformations in the Coordinate Plane	
Assignments	
Coordinate Algebra	1. Geometry Undefined Terms: Point, Line and Plane
	2. Geometry and Defined Terms
	3. Angles and Parallels: Angle Definitions
	4. Quiz 1
	5. Angle Relationship Definitions
	6. Angle Relationships and Parallel Lines
	7. Project: Lifelike Parallel and Perpendicular Lines
	8. Circles
	9. Quiz 2
	10. Project: Creating Parallel Relationships
11. Introduction: Rigid Motion, or Isometry	
12. Isometry and Reflection	
13. Translations and Dilations	
14. Rotations	
15. Quiz 3	
16. Project: Creative Transformations	
17. Review	
18. Test	
19. Alternate Test - Form A*	

Unit 7: Connecting Algebra and Geometry Through Coordinates	
Assignments	
Coordinate Algebra	1. Parallel and Perpendicular Lines
	2. Equations of Parallel and Perpendicular Lines
	3. Quiz 1
	4. Plane to Circles in the Coordinate Plane
	5. Quadrilaterals in the Coordinate Plane
	6. More Quadrilaterals in the Coordinate Plane
	7. Quiz 2
	8. Area Concepts of Polygons
9. Area of Rectangles and Rhombuses	
10. Area of Triangles and Rhombuses	
11. Area of Trapezoids	
12. Project: Geometric Figures in the Coordinate Plane	
13. Quiz 3	
14. Review	
15. Test	
16. Alternate Test - Form A*	

Unit 8: Semester 2 Exam	
Assignments	
1. Exam	2. Alternate Exam*

Unit 9: Semester 2 Exam	
Assignments	
1. Exam	3. Alternate Test - Form A*
2. Alternate Test - Form A*	

(\*) Indicates alternative assignment