

CURRICULUM OVERVIEW

Coordinate Algebra



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

Unit 2: Reasoning With Equations and Inequalities**Assignments**

Coordinate Algebra

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

Unit 3: Linear and Exponential Functions**Assignments**

Coordinate Algebra

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

Unit 4: Semester 1 Exam**Assignments**

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| 1. Exam | 2. Alternate Exam* |
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Unit 5: Describing Data**Assignments**

Coordinate Algebra

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

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