



Math Department Curriculum Guide

Algebra 1

Course Description

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in the prior grades. The critical areas deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions.

Upon successful completion of this course, students will be able to:

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| <ul style="list-style-type: none"> ▪ Interpret the structure of expressions ▪ Write expressions in equivalent forms to solve problems ▪ Perform arithmetic operations on polynomials ▪ Understand the relationship between zeros and factors of polynomials ▪ Use polynomial identities to solve problems ▪ Rewrite rational functions ▪ Create equations that describe numbers or relationships ▪ Understand solving equations as a process of reasoning and explain the reasoning ▪ Solve equations and inequalities in one variable ▪ Solve systems of equations ▪ Represent and solve equations and inequalities graphically |
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Graphing Calculator

Hanover High School students enrolled in Algebra 1, Algebra 2, Precalculus, Calculus, or Statistics should purchase a graphing calculator, preferably a TI-84 Plus or TI-84 Color. It is important for students to gain familiarity with their own calculator in order to use it as a tool during class and for homework. Furthermore, students are expected to use calculators on standardized assessments, including MCAS, PSAT, SAT, and AP, as well as college placement exams. Many of the questions on these assessments are designed in such a way that students are expected to use a graphing calculator. Although there are graphing calculator apps that can be downloaded and used on mobile devices, keep in mind that mobile devices are not allowed on the MCAS, PSAT, SAT, and AP exams. Therefore, it is important that students have access to and learn to use an assessment-approved graphing calculator. There is a limited number of graphing calculators that can be borrowed on a first come first serve basis – please contact the office for information.
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Algebra 1 – Calculator Skills

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| <ul style="list-style-type: none"> ➤ Perform operations with fractions and exponents ➤ Convert between decimals and fractions ➤ Enter equations in $y =$ ➤ Manipulate the window ➤ Manipulate and use the table ➤ Graph functions ➤ Analyze functions by using tables, graphs, and equations |
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Content Standards

Number and Quantity

The Real Number System

- A. Extend the properties of exponents to rational exponents.
- B. Use properties of rational and irrational numbers.

Quantities

- A. Reason quantitatively and use units to solve problems.

Algebra

Seeing Structure in Expressions

- A. Interpret the structure of linear, quadratic, and exponential expressions with integer exponents.
- B. Write expressions in equivalent forms to solve problems.

Arithmetic with Polynomials and Rational Expressions

- A. Perform arithmetic operations on polynomials.

Creating Equations

- A. Create equations that describe numbers or relationships.

Reasoning with Equations and Inequalities

- A. Understand solving equations as a process of reasoning and explain the reasoning.
- B. Solve equations and inequalities in one variable.
- C. Solve systems of equations.
- D. Represent and solve equations and inequalities graphically.

Functions

Interpreting Functions

- A. Understand the concept of a function and use function notation.
- B. Interpret linear, quadratic, and exponential functions with integer exponents that arise in applications in terms of the context.
- C. Analyze functions using different representations.

Building Functions

- A. Build a function that models a relationship between two quantities.
- B. Build new functions from existing functions.

Linear, Quadratic, and Exponential Models

- A. Construct and compare linear, quadratic, and exponential models and solve problems.
- B. Interpret expressions for functions in terms of the situation they model.

Statistics and Probability

Interpreting Categorical and Quantitative Data

- A. Summarize, represent, and interpret data on a single count or measurement variable. Use calculators, spreadsheets, and other technology as appropriate.
- B. Summarize, represent, and interpret data on two categorical and quantitative variables.
- C. Interpret linear models.



Subject: Algebra 1 – CP

Unit	Content
Unit 1 - Foundations for Algebra Term 1 September	▪ Variables ▪ Expressions ▪ Order of operations ▪ Properties of real numbers
Unit 2 - Solving Equations Term 1 September and October	▪ Solving equations with variables on both sides ▪ Literal equations and formulas
Unit 3 - Solving Inequalities Term 1 October	▪ Inequalities and their graphs ▪ Solving inequalities using addition and subtraction ▪ Solving inequalities using multiplication and division ▪ Solving multi-step inequalities ▪ Compound inequalities ▪ Union of sets/Set builder notation ▪ Absolute value equations and inequalities
Unit 4 - Introduction to Functions Term 2 November	▪ Story graphing ▪ Linear versus non-linear ▪ Writing function rule ▪ Domain and range ▪ Arithmetic sequences
Unit 5 - Linear Functions Term 2 November and December	▪ Rate of change and Slope ▪ Direct variation ▪ Slope intercept form ▪ Parallel and perpendicular lines ▪ Point-slope form ▪ Standard form ▪ Absolute value functions ▪ Scatter plots
Unit 6 - Systems of Equations and Inequalities Term 2 and Term 3 January and February	▪ Solving systems by graphing ▪ Solving systems by substitution ▪ Solving systems by elimination ▪ Applications of systems ▪ Linear inequalities ▪ Systems of linear inequalities



Unit	Content
Unit 7 - Exponents and Exponential Functions Term 3 February and March	▪ Zero and negative exponents ▪ Multiplying powers with same base ▪ Division properties of exponents ▪ Rational exponents and radicals ▪ Exponential functions ▪ Exponential growth and decay ▪ Geometric Sequence
Unit 8 - Polynomials and Factoring Term 4 March and April	▪ Adding and subtracting polynomials ▪ Multiplying and Factoring ▪ Multiplying binomials ▪ Factoring
Unit 9 - Quadratic Functions and Equations Term 4 April and May	▪ Quadratic graphs and their properties ▪ Quadratic functions ▪ Solving quadratic equations ▪ Factoring to solve quadratic equations ▪ Completing the square ▪ Quadratic formula/discriminant ▪ Systems of linear and quadratic equations
Unit 10 - Data Analysis and Probability Term 4 June	▪ Mean, Median, Mode ▪ Box and whisker plot ▪ Upper and Lower Quartiles ▪ Outliers