

# High School Algebra I

## Relationships between Quantities and Reasoning with Equations

### Cluster: Reason quantitatively and use units to solve problems.

- 1 Express quantities to the appropriate precision of measurement (e.g., measure a pencil to the nearest inch). [A.M.A1HS.1](#)
- 2 Define appropriate quantities for the purpose of descriptive modeling. [A.M.A1HS.2](#)
- 3 Choose the appropriate unit of measurement (e.g., determine when to use feet/inches/meter, cups/gallons/liter, ounces/pounds/gram, etc.). [A.M.A1HS.3](#)

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### Cluster: Interpret the structure of expressions.

- 4 Identify an algebraic expression involving at least one arithmetic operation to represent a real-world problem. [A.M.A1HS.4](#)

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### Cluster: Interpret the structure of expressions.

- 5 Given a real-world problem situation, write, read, and/or solve one-step addition and subtraction equations for an unknown number, with a variable standing for the unknown (e.g.,  $\$8.50 + c = \$12$ ). [A.M.A1HS.5](#)
- 6 Determine solutions to equations that model real-world problem situations with two unknowns (e.g., given a set of options, find solutions for  $x + y = \$6.25$ ). [A.M.A1HS.6](#)
- 7 Demonstrate an understanding of terms such as “at least” and “fewer than” in solving real-world problems. [A.M.A1HS.7](#)
- 8 Solve two-step word problems, represent these problems using formulas with a letter standing for the unknown quantity. [A.M.A1HS.8](#)

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### Cluster: Understand solving equations as a process of reasoning and explaining the reasoning.

- 9 Demonstrate each step in solving a one or two-step equation. [A.M.A1HS.9](#)
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## Linear and Exponential Relationships

### Cluster: Represent and solve equations and inequalities graphically.

- 10 Interpret the meaning of a point on the graph of a linear function (e.g., on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost of the pizzas). [A.M.A1HS.10](#)
- 11 Interpret the meaning of the intersection of the two graphs. [A.M.A1HS.11](#)
- 12 With the assistance of a graphing calculator and visual cue cards as needed, graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality) and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding halfplanes. [A.M.A1HS.12](#)

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### Cluster: Understand the concept of a function.

- 13 Using a calculator and a visual cue card of function rules that describe proportional relationships, solve real-world problems (e.g., Unit Cost  $\times$  Number of Items = Total Cost). [A.M.A1HS.13](#)
- 14 Using a calculator and a visual cue card of function rules, solve real-world problems (e.g., given a \$10 off coupon, use Sales Price = Original Price – Discount to find the Sales Price). [A.M.A1HS.14](#)
- 15 Determine the missing values in arithmetic sequences. Instructional Note: Limit the common ratio in arithmetic sequences to integers (e.g., 20, 18, 16, \_\_\_\_, 12, 8, ... or 3, 7, 11, 15, \_\_\_\_, 23, ...). [A.M.A1HS.15](#)

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### Cluster: Interpret functions that arise in applications in terms of a context.

- 16 Interpret data from graphs that represent linear functions with different rates of change and interpret which has the greater rate of change. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative. [A.M.A1HS.16](#)
- 17 Given real-world measures, demonstrate an understanding of domains (e.g., there are seven days in a week; twelve months in a year; twelve inches in a foot). [A.M.A1HS.17](#)
- 18 Calculate and interpret the rate of change of a function presented as a table (e.g., the following table has a rate of change of -2). [A.M.A1HS.18](#)

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### Cluster: Analyze representations of functions.

- 19 With the assistance of a graphing calculator and visual cue cards as needed, graph functions expressed symbolically and show key features of the graph. Instructional Note: Focus on linear functions. [A.M.A1HS.19](#)
- 20 Identify information for two functions represented in different tables (e.g., Store A's Discount Table and Store B's Discount Table). [A.M.A1HS.20](#)

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**Cluster: Build a function that models a relationship between two quantities.**

- 21 Given a linear function represented by a table, determine the rate of change and add additional values to extend the table. [A.M.A1HS.21](#)
- 22 Determine the common ratio in arithmetic sequences (e.g., recognize that “down 2” would describe the common ratio for a sequence such as 20, 18, 16, 14, 12... and write it as -2.) [A.M.A1HS.22](#)

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**Cluster: Compare linear and exponential models and solve problems.**

- 23 Given a graph, distinguish between linear functions and exponential functions. [A.M.A1HS.23](#)
- 24 From a given list recognize linear and exponential functions, including arithmetic sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). [A.M.A1HS.24](#)
- 25 Given two tables representing linear real-world function, determine which is increasing at a greater rate. [A.M.A1HS.25](#)

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**Cluster: Interpret expressions for functions in terms of the situation they model**

- 26 Interpret the parameters in a linear function in terms of a context. Instructional Note: Limit to linear functions. [A.M.A1HS.26](#)

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**Descriptive Statistics**

**Cluster: Summarize, represent, and interpret data on a single count or measurement variable.**

- 27 Represent data with dot plots on a number line. [A.M.A1HS.27](#)
- 28 Given a dot plot, identify the maximum value, the minimum value, and the mode. [A.M.A1HS.28](#)
- 29 Interpret differences in graphs of data sets. [A.M.A1HS.29](#)

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**Cluster: Summarize, represent, and interpret data on two categorical and quantitative variables.**

- 30 Sort data or objects according to characteristics, similarities, and/or associations. Interpret frequencies in the context of the data (e.g., after surveying students, regarding their favorite ice cream flavor, answer related questions). [A.M.A1HS.30](#)
- 31 Represent data of frequency using tally charts in real world situations. [A.M.A1HS.31](#)

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**Cluster: Distinguish between cause and effect.**

- 32 In real world situations, distinguish between the cause and the effect. [A.M.A1HS.32](#)

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**Expressions and Equations**

**Cluster: Interpret the structure of equations.**

- 33 Given a real world problem and a choice of two algebraic expressions involving arithmetic operations, identify the algebraic expression that models the situation. [A.M.A1HS.33](#)

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**Cluster: Write expressions in equivalent forms to solve problems.**

- 34 Solve an algebraic expression involving arithmetic operations to represent a real-world problem (e.g., Jan has \$10. She buys a loaf of bread for \$2 and a gallon of milk. She now has \$5. What is the cost of the milk?) [A.M.A1HS.34](#)
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**Cluster: Create equations that describe numbers or relationships.**

- 35 Determine solutions to equations that model real-world problem situations with two unknowns (e.g., given a set of options, find solutions for  $x + y = \$6.25$ ). [A.M.A1HS.35](#)
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**Cluster: Solve equations that describe numbers or relationships**

- 36 Given choices and use of a calculator, solve quadratic equations in one variable by inspection (e.g., for  $x^2 = 49$ ). [A.M.A1HS.36](#)
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**Linear Functions and Modeling**

**Cluster: Use properties of rational and irrational numbers.**

- 37 Solve addition, subtraction, multiplication, and division real-world problems involving whole numbers and decimals (i.e., money) using visuals and/or a calculator. [A.M.A1HS.37](#)
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**Cluster: Interpret functions that arise in applications in terms of a context.**

- 38 Given a real-world function, find the possible values of the domain (e.g., Could you work 10 days a week? How many days a week can you work?). [A.M.A1HS.38](#)
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**Cluster: Analyze representations of functions.**

- 39 Compare two functions represented in different tables (e.g., Store A's Discount Table and Store B's Discount Table) to answer questions. [A.M.A1HS.39](#)