



## Math Power Standards: Algebra I

### Seeing Structure in Expressions:

#### **HS.A-SSE.A Interpret the structure of expressions.**

- Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1)
  - a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a)
  - b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret  $P(1+r)^t$  as the product of  $P$  and a factor not depending on  $P$  (CCSS: HS.A-SSE.A.1.b)

### Arithmetic with Polynomials & Rational Expressions:

#### **HS.A-APR.A Perform arithmetic operations on polynomials.**

- Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)

### Creating Equations:

#### **HS.A-CED.A Create equations that describe numbers or relationships**

- Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)
- Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)
- Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law  $V = iR$  to highlight resistance  $R$ . (CCSS: HS.A-CED.A.4)

### Reasoning with Equations & Inequalities:

#### **HS.A-REI.B Solve equations and inequalities in one variable..**

- Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)
- Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4)
  - a. Solve quadratic equations (e.g., for  $x^2=49$ ) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as  $a + bi$  for real numbers  $a$  and  $b$  (CCSS: HS.A-REI.B.4.a)
  - b. Solve quadratic equations (e.g., for  $x^2=49$ ) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as  $a + bi$  for real numbers  $a$  and  $b$  (CCSS: HS.A-REI.B.4.b)

### **HS.A-REI.D Represent and solve equations and inequalities graphically.**

- Explain that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (CCSS: HS.A-REI.D.10)

### **Interpreting Functions:**

#### **HS.F-IF.A Understand the concept of a function and use function notation.**

- Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y=f(x)$ . (CCSS:HS.F-IF.A.1)
- Use function notation evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)

#### **HS.F-IF.B Interpret functions that arise in applications in terms of the context.**

- For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)
- Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)

#### **HS.F-IF.C Analyze Functions using different representations**

- Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)