# Evidence Statement Tables

# Algebra I

# Evidence Statement Keys

Evidence statements describe the knowledge and skills that an assessment item/task elicits from students. These are derived directly from the Common Core State Standards for Mathematics (the standards), and they highlight the advances of the standards, especially around their focused coherent nature. The evidence statement keys for grades 3 through 8 will begin with the grade number. High school evidence statement keys will begin with "HS" or with the label for a conceptual category.

An Evidence Statement might:

1. **Use exact standard language** – For example:

   - 8.EE.1 - Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. This example uses the exact language as standard 8.EE.1

2. **Be derived by focusing on specific parts of a standard** – For example: 8.F.5-1 and 8.F.5-2 were derived from splitting standard 8.F.5:

   - 8.F.5-1 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear).
   - 8.F.5-2 Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

   Together these two evidence statements are standard 8.F.5:

   Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or 2 decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

3. **Be integrative (Int) –** Integrative evidence statements allow for the testing of more than one of the standards on a single item/task without going beyond the standards to create new requirements. An integrative evidence statement might be integrated across all content within a grade/course, all standards in a high school conceptual category, all standards in a domain, or all standards in a cluster. For example:

   - **Grade/Course – 4.Int.2**[1] (Integrated across Grade 4)

- **Conceptual Category – F.Int.1[1]** (Integrated across the Functions Conceptual Category)
- **Domain – 4.NBT.Int.1[1]** (Integrated across the Number and Operations in Base Ten Domain)
- **Cluster** – **3.NF.A.Int.1[1]** (Integrated across the Number and Operations – Fractions Domain, Cluster A )

4. **Focus on mathematical reasoning–** A reasoning evidence statement (keyed with C) will state the type of reasoning that an item/task will require and the content scope from the standard that the item/task will require the student to reason about. For example:

- 3.C.2[1] -- Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division.
  - Content Scope: Knowledge and skills are articulated in 3.OA.6
- 7.C.6.1[1] – Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures.
  - Content Scope: Knowledge and skills are articulated in 7.RP.2

**Note:** When the focus of the evidence statement is on reasoning, the evidence statement may also require the student to reason about securely held knowledge from a previous grade.

5. **Focus on mathematical modeling –** A modeling evidence statement (keyed with D) will state the type of modeling that an item/task will require and the content scope from the standard that the item/task will require the student to model about. For example:

- 4.D.2[1] – Solve multi-step contextual problems with degree of difficulty appropriate to Grade 4 requiring application of knowledge and skills articulated in 3.OA.A, 3.OA.8,3.NBT, and/or 3.MD.

**Note:** The example 4.D.2 is of an evidence statement in which an item/task aligned to the evidence statement will require the student to model on grade level, using securely held knowledge from a previous grade.

- HS.D.5[1] - Given an equation or system of equations, reason about the number or nature of the solutions.
  - Content scope: A-REI.11, involving any of the function types measured in the standards.

[1] The numbers at the end of the integrated, modeling and reasoning Evidence Statement keys are added for assessment clarification and tracking purposes. For example, 4.Int.2 is the second integrated Evidence Statement in Grade 4.

# Algebra I Evidence Statements
# Listing by Type I, Type II, and Type III

The Evidence Statements for Grade 3 Mathematics are provided starting on the next page. The list has been organized to indicate whether items designed are aligned to an Evidence Statement used for Type I items (sub-claims A and B), Type II items (reasoning/sub-claim C), or Type III items (modeling/sub-claim D).

Evidence Statements are presented in the order shown below and are color coded:

Peach – Evidence Statement is applicable to Type I items.

Lavender – Evidence Statement is applicable to Type II items.

Aqua – Evidence Statement is applicable to Type III items.

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| **Sub-claim A (17 of 55 points) Sub-claim B (10 of 55 points) & Integrated (3 points - Mater Claim)** | | | | | |
| A | A-APR.1-1 | Add, subtract, and multiply polynomials. | i) The "understand" part of the standard is not assessed here; it is assessed under Sub-claim C. | - | Z |
| B | A-APR.3-1 | Identify zeros of quadratic and cubic polynomials in which linear and quadratic factors are available, and use the zeros to construct a rough graph of the function defined by the polynomial. | i) For example, find the zeros of $(x - 2)(x^2 - 9)$.<br>ii) Sketching graphs is limited to quadratics.<br>iii) For cubic polynomials, at least one linear factor must be provided or one of the linear factors must be a GCF. | MP.7 | N |
| A | A-CED.3-1 | Solve multi-step contextual problems that require writing and analyzing systems of linear inequalities in two variables to find viable solutions. | i) Tasks have hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.).<br>ii) Scaffolding in tasks may range from substantial to very little or none. | MP.1, MP.2, MP.4 | X |
| A | A-CED.4-1 | Rearrange linear 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.* | i) Tasks have a real-world context.<br>ii) The quantity of interest is linear in nature. | MP.2, MP.6, MP.7 | Z |
| A | A-CED.4-2 | Rearrange formulas that are quadratic in the quantity of interest to highlight the quantity of interest, using the same reasoning as in solving equations. | i) Tasks have a real-world context. | MP.2, MP.6, MP.7 | Z |
| A | A-REI.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | i) Tasks do not include absolute value equations or compound inequalities. | MP.7 | X |
| A | A-REI.4a-1 | Solve quadratic equations in one variable.<br>a) Use the method of completing the square to transform any quadratic equation in $x$ into an equation of the form $(x - p)^2 = q$ that has the same solutions. | i) The derivation part of the standard is not assessed here; it is assessed under Sub-Claim C. | MP.1, MP.7 | X |

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| A | A-REI.4b-1 | Solve quadratic equations in one variable.<br>b) Solve quadratic equations with rational number coefficients by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. | i) Tasks should exhibit variety in initial forms. Examples of quadratic equations with real solutions: $t^2 = 49, 3a^2 = 4, 7 = x^2, r^2 = 0, \frac{1}{2}y^2 = \frac{1}{5}, y^2 - 8y + 15 = 0, 2x^2 - 16x + 30 = 0, 2p = p^2 + 1, t^2 = 4t, 7x^2 + 5x - 3 = 0, \frac{3}{4}c(c-1) = c, (3c-2)^2 = 6x - 4$<br>ii) Methods are not explicitly assessed; strategy is assessed indirectly by presenting students with a variety of initial forms.<br>iii) For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required; however, students will not be penalized if they simplify the radicals correctly.<br>iv) Prompts integrate mathematical practices by not indicating that the equation is quadratic. (e.g., "Find all real solutions of the equation $t^2 = 4t$"... not, "Solve the quadratic equation $t^2 = 4t$") | MP.5, MP.7 | X |
| A | A-REI.4b-2 | Solve quadratic equations in one variable.<br>b) Recognize when the quadratic formula gives complex solutions. | i) Writing solutions in the form a ± bi is not assessed here. (Assessed under N-CN.7.) | MP.5, MP.7 | X |
| B | A-REI.6-1 | Solve multi-step contextual problems that require writing and analyzing systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. | i) Tasks have hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.).<br>ii) Scaffolding in tasks may range from substantial to very little or none. | MP.1, MP.2, MP.4 | X |
| A | A-REI.10 | Understand 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). | - | MP.7 | X |

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| A | A-REI.11-1 | Find the solutions of where the graphs of the equations *y= f(x)* and *y= g(x)* intersect, e.g. using technology to graph the functions, make tables of values or find successive approximations. Limit *f(x)* and/or *g(x)* to linear and quadratic functions.★ | i) The "explain" part of standard A-REI.11 is not assessed here. For this aspect of the standard, see Sub-Claim C. | MP.1, MP.5 | Y |
| A | A-REI.12 | Graph the solutions to a linear inequality in two variables as a half-plane (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 half-planes. | - | MP.1, MP.5, MP.6 | N |
| A | A-SSE.1-1 | Interpret exponential expressions, including related numerical expressions that represent a quantity in terms of its context.★<br>a) Interpret parts of an expression, such as terms, factors, and coefficients.<br>b) Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1 + r)^n$ *as the product of P and a factor not depending on P.* | i) See illustrations for A-SSE.1 at http://illustrativemathematics.org e.g., http://illustrativemathematics.org/illustrations/390 | MP.7 | Z |
| A | A-SSE.1-2 | Interpret quadratic expressions that represent a quantity in terms of its context.★<br>a) Interpret parts of an expression, such as terms, factors, and coefficients.<br>b) Interpret complicated expressions by viewing one or more of their parts as a single entity. | i) See illustrations for A-SSE.1 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/90 | MP.7 | Z |
| A | A-SSE.2-1 | Use the structure of numerical expressions and polynomial expressions in one variable to identify ways to rewrite it. | i) Examples: Recognize $53^2 – 47^2$ as a difference of squares and see an opportunity to rewrite it in the easier-to-evaluate form (53 + 47)(53 – 47).<br>ii) Limit to problems intended to be solved with one step.<br>iii) Tasks do not have a context. | MP.7 | Z |

# Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| A | A-SSE.2-4 | Use the structure of a numerical expression or polynomial expression in one variable to rewrite it, in a case where two or more rewriting steps are required. | i) Example: Factor completely: $\boldsymbol{x^2-1+(x-1)^2}$. (A first iteration might give $\boldsymbol{(x+1)(x-1)+(x-1)^2}$, which could be rewritten as $\boldsymbol{(x+1)(x+1+x-1)}$ on the way to factoring completely as $\boldsymbol{2x(x-1)}$. Or the student might first expand, as: $\boldsymbol{x^2-1+x^2-2x+1}$, rewriting as $\boldsymbol{2x^2-2x}$, then factoring as $\boldsymbol{2x(x-1)}$.)<br>ii) Tasks do not have a real-world context. | MP.1, MP.7 | Z |
| B | A-SSE.3a | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★<br>a) Factor a quadratic expression to reveal the zeros of the function it defines. | i) The equivalent form must reveal the zeroes of the function.<br>ii) Tasks require students to make the connection between the equivalent forms of the expression. | MP.7 | Z |
| B | A-SSE.3b | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★<br>a) Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. | i) Tasks require students to make the connection between the equivalent forms of the expression. | MP.7 | Z |
| B | A-SSE.3c-1 | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression, where exponentials are limited to integer exponents. ★<br>c) Use the properties of exponents to transform expressions for exponential functions. | i) Tasks have a real-world context.<br>ii) The equivalent form must reveal something about the real-world context.<br>iii) Tasks require students to make the connection between the equivalent forms of the expression. | MP.1, MP.2, MP.4, MP.7 | X |
| B | F-BF.3-1 | Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of *k* (both positive and negative); find the value of *k* given the graphs limiting the function types to linear and quadratic functions. | i) Tasks do not involve recognizing even and odd functions.<br>ii) Experimenting with cases and illustrating an explanation are not assessed here. They are assessed under Sub-claim C.<br>iii) Tasks may involve more than one transformation. | MP.3, MP.5, MP.7 | X |

# Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| B | F-BF.3-4 | Identify the effect on the graph of a quadratic function of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases using technology. | i) Illustrating an explanation is not assessed here. Explanations are assessed under Sub-claim C. | MP.3, MP.5, MP.8 | X |
| A | F-IF.1 | Understand that a function from one set (called the domain) to another set (called the range) 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 $y = f(x)$. | - | MP.2 | Z |
| A | F-IF.2 | Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. | i) See illustrations for F-IF.2 at http://illustrativemathematics.org | MP.6, MP.7 | X |
| A | F-IF.4-1 | For a linear or quadratic 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 given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; end behavior; and symmetries.*★ | i) See illustrations for F-IF.4 at http://illustrativemathematics.org, e.g.<br>http://illustrativemathematics.org/illustrations/649<br>http://illustrativemathematics.org/illustrations/637<br>http://illustrativemathematics.org/illustrations/639 | MP.4, MP.6 | X |
| A | F-IF.5-1 | Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes, limiting to linear functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute-value functions), and exponential functions with domains in the integers. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for this function.*★ | i) Tasks have a real-world context. | MP.2 | Z |
| A | F-IF.5-2 | Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes, limiting to quadratic functions. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for this function.*★ | i) Tasks have a real-world context. | MP.2 | Z |
| A | F-IF.6-1a | Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear, exponential (with domains in the integers), and quadratic functions.★ | i) Tasks have a real-world context.<br>ii) Tasks must include the interpret part of the evidence statement. | MP.1, MP.4, MP.5, MP.7 | X |

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| A | F-IF.6-1b | Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to square root, cube root, and piecewise-defined (including step and absolute value functions) functions.★ | i) Tasks have a real-world context.<br>ii) Tasks must include the interpret part of the evidence statement. | MP.1, MP.4, MP.5, MP.7 | X |
| A | F-IF.6-6a | Estimate the rate of change from a graph of linear functions and quadratic functions.★ | i) Tasks have a real-world context. | MP.1, MP.4, MP.5, MP.7 | X |
| A | F-IF.6-6b | Estimate the rate of change from a graph of linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and/or exponential functions with domains in the integers.★ | i) Tasks have a real-world context. | MP.1, MP.4, MP.5, MP.7 | X |
| B | F-IF.7a-1 | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★<br>a) Graph linear functions and show intercepts. | - | MP.1, MP.5, MP.6 | X |
| B | F-IF.7a-2 | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★<br>a) Graph quadratic functions and show intercepts, maxima, and minima. | - | MP.1, MP.5, MP.6 | X |

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| B | F-IF.7b | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★<br>b) Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. | i) Discontinuities are allowed as key features of the graph. | MP.1, MP.5, MP.6 | X |
| B | F-IF.8a | Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.<br>a) Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. | i) Tasks have a real-world context. | MP.2 | Y |
| B | F-IF.9-1 | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* Function types should be limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers. | i) Tasks may have a real-world context. | MP.1, MP.3, MP.5, MP.6, MP.8 | X |
| A | F-IF.A.Int.1 | Understand the concept of a function and use function notation. | i) Tasks require students to use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a real-world context.<br>ii) About a quarter of tasks involve functions defined recursively on a domain in the integers. | MP.2 | X |
| B | F-LE.2-1 | Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). | i) Tasks are limited to constructing linear and exponential functions with domains in the integers, in simple real-world context (not multi-step). | MP.1, MP.2, MP.5 | X |
| B | F-LE.2-2 | Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing linear and/or exponential function models, where exponentials are limited to integer exponents.★ | i) Prompts describe a scenario using everyday language. Mathematical language such as "function," "exponential," etc. is not used.<br>ii) Students autonomously choose and apply appropriate mathematical techniques without prompting. For example, in a situation of doubling, they apply techniques of exponential functions.<br>iii) For some illustrations, see tasks at http://illustrativemathematics.org | MP.1, MP.2, MP.4, MP.6 | X |

# Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| Ψ | F-Int.1-1 | Given a verbal description of a linear or quadratic functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function. | i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, nonlinear; and find an input value leading to a given output value.<br>- e.g., a functional dependence might be described as follows: "The area of a square is a function of the length of its diagonal." The student would be asked to create an expression such as $f(x) = \frac{1}{2}x^2$ for this function. The natural domain for the function would be the positive real numbers. The function is increasing and nonlinear. And so on.<br>- e.g., a functional dependence might be described as follows: "The slope of the line passing through the points (1, 3) and (7, y) is a function of y." The student would be asked to create an expression such as $s(y) = (3 - y)/(1 - 7)$ for this function. The natural domain for this function would be the real numbers. The function is increasing and linear. And so on. | MP.1, MP.2, MP.8 | X |
| Ψ | S-ID.Int.1 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, excluding normal distributions and limiting function fitting to linear functions and exponential functions with domains in the integers. | i) Tasks should go beyond 6.SP.4.<br>ii) For tasks that use bivariate data, limit the use of time series. Instead use data that may have variation in the y-values for given x-values, such as pre and post test scores, height and weight, etc.<br>iii) Predictions should not extrapolate far beyond the set of data provided.<br>iv) Line of best fit is always based on the equation of the least squares regression line either provided or calculated through the use of technology.<br>v) To investigate associations, students may be asked to evaluate scatter plots that may be provided or created using technology. Evaluation includes shape, direction, strength, presence of outliers, and gaps.<br>vi) Analysis of residuals may include the identification of a pattern in a residual plot as an indication of a poor fit.<br>vii) Exponential models may assess rate of growth, intercepts, etc. | MP.1, MP.2, MP.4, MP.5, MP.6 | Y |

## Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| Ψ | S-ID.Int.2 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, excluding normal distributions and limiting function fitting to quadratic, linear, and exponential (with domains in the integers) functions with an emphasis on quadratic functions. | i) Tasks should go beyond 6.SP.4<br>ii) For tasks that use bivariate data, limit the use of time series. Instead use data that may have variation in the y-values for given x-values,<br>iii) Predictions should not extrapolate far beyond the set of data provided.<br>iv) To investigate associations, students may be asked to evaluate scatter plots that may be provided or created using technology. Evaluation includes shape, direction, strength, presence of outliers, and gaps.<br>v) Analysis of residuals may include the identification of a pattern in a residual plot as an indication of a poor fit. Quadratic models may assess minimums/maximums, intercepts, etc. | MP.1, MP.2, MP.4, MP.5, MP.6 | Y |
| B | S-ID.5 | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. | i) Tasks must have at least one of the categorical variables with more than two sub-categories.<br>ii) "Total" rows and columns will be provided but may be missing the data.<br>iii) Associations should be investigated based on relative frequencies, not counts. | MP.1, MP.5, MP.7 | Y |
| B | N-RN.B-1 | Apply properties of rational and irrational numbers to identify rational and irrational numbers. | i) Tasks should go beyond asking students to only identify rational and irrational numbers.<br>ii) This evidence statement is aligned to the cluster heading. This allows other cases besides the three cases listed in N-RN.3 to be assessed.<br>iii) Quotients of rational and irrational numbers can be assessed. | MP.6 | N |

# Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
| --- | --- | --- | --- | --- | --- |
| Ψ | HS-Int.1 | Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing quadratic function models and/or writing and solving quadratic equations. | i) A scenario might be described and illustrated with graphics (or even with animations in some cases).<br><br>ii) Solutions may be given in the form of decimal approximations. For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required; however, students will not be penalized if they simplify the radicals correctly.<br><br>Some examples:<br>- A company sells steel rods that are painted gold. The steel rods are cylindrical in shape and 6 cm long. Gold paint costs $0.15 per square inch. Find the maximum diameter of a steel rod if the cost of painting a single steel rod must be $0.20 or less. You may answer in units of centimeters or inches. Give an answer accurate to the nearest hundredth of a unit.<br>- As an employee at the Gizmo Company, you must decide how much to charge for a gizmo. Assume that if the price of a single gizmo is set at *P* dollars, then the company will sell $1000 - 0.2P$ gizmos per year. Write an expression for the amount of money the company will take in each year if the price of a single gizmo is set at P dollars. What price should the company set in order to take in as much money as possible each year? How much money will the company make per year in this case? How many gizmos will the company sell per year? (Students might use graphical and/or algebraic methods to solve the problem.)<br>- At $t = 0$, a car driving on a straight road at a constant speed passes a telephone pole. From then on, the car's distance from the telephone pole is given by $C(t) = 30t$, where *t* is in seconds and *C* is in meters. Also at $t = 0$, a motorcycle pulls out onto the road, driving in the same direction, initially 90 m ahead of the car. From then on, the motorcycle's distance from the telephone pole is given by $M(t) = 90 + 2.5\,t^2$, where *t* is in seconds and *M* is in meters. At what time *t* does the car catch up to the motorcycle? Find the answer by setting *C* and *M* equal. How far are the car and the motorcycle from the telephone pole when this happens? (Students might use graphical and/or algebraic methods to solve the problem.) | MP.1, MP.2, MP.4, MP.5, MP.6 | Y |

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| Ψ | HS-Int.2 | Solve multi-step mathematical problems with degree of difficulty appropriate to the course that requires analyzing quadratic functions and/or writing and solving quadratic equations. | i) Tasks do not have a real-world context.<br>ii) Exact answers may be required or decimal approximations may be given. Students might choose to take advantage of the graphing utility to find approximate answers or clarify the situation at hand. For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required.<br>Some examples:<br>- Given the function $f(x) = x^2 + x$, find all values of *k* such that $f(3-k) = f(3)$. (Exact answers are required.)<br>- Find a value of *c* so that the equation $2x^2 - cx + 1 = 0$ has a double root. Give an answer accurate to the tenths place. | MP.1, MP.2, MP.5, MP.6 | Y |
| Ψ | HS-Int.3-1 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-LE, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers.★ | i) F-LE.A, Construct and compare linear, quadratic, and exponential models and solve problems, is the primary content and at least one of the other listed content elements will be involved in tasks as well. | MP.2, MP.4 | Y |
| Ψ | HS-Int.3-2 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-LE, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear, quadratic, and exponential functions.★ | i) F-LE.A, Construct and compare linear, quadratic, and exponential models and solve problems, is the primary content and at least one of the other listed content elements will be involved in tasks as well. For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required; however, students will not be penalized if they simplify the | MP.2, MP.4 | Y |

★ Modeling standards appear throughout the CCSSM. Evidence statements addressing these modeling standards are indicated by a star symbol (★)

Ψ - These integrated evidence statements will be reported in the Master Claim which is used to determine if a student is college or career ready.

*Calculator Key:
Y – Yes; Assessed on Calculator Section
X – Calculator is Specific to Item
N – No; Assessed on Non-Calculator Sections
Z – Calculator Neutral (Could Be on Calculator or Non-Calculator Sections)

## Algebra I Evidence Statements

**Type I** **Type II** **Type III**

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| **Sub-claim C (10 of 55 points)** | | | | | |
| C | HS-C.2.1 | Base explanations/reasoning on the properties of rational and irrational numbers.<br>Content scope: N-RN.3 | i) For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required; however, students will not be penalized if they simplify the radicals correctly. | MP.3 | Y |
| C | HS-C.5.5 | Given an equation or system of equations, reason about the number or nature of the solutions.<br>Content scope: A-REI.4a, A-REI.4b, limited to real solutions only. | | MP.3 | Y |
| C | HS-C.5.6 | Given a system of equations, reason about the number or nature of the solutions.<br>Content scope: A-REI.5 | i) In a system of linear equations, if the two given equations are simultaneous, the solution could be described by students as infinitely many solutions, infinitely many solutions on the line, or all real numbers on the line. A solution of "all real numbers" alone is not sufficient for credit because all points in space are not solutions, only the points on the line. | MP.3 | Y |
| C | HS-C.5.10-1 | Given an equation or system of equations, reason about the number or nature of the solutions.<br>Content scope: A-REI.11, limited to equations of the form $f(x) = g(x)$ where *f* and *g* are linear or quadratic. | - | MP.3 | Y |
| C | HS-C.6.1 | Base explanations/reasoning on the principle that the graph of an equation and inequalities in two variables is the set of all its solutions plotted in the coordinate plane.<br>Content scope: A-REI.D, excluding exponential and logarithmic functions. | - | MP.3 | Y |
| C | HS-C.8.1 | Construct, autonomously, chains of reasoning that will justify or refute algebraic propositions or conjectures.<br>Content scope: A-APR.1 | - | MP.3 | Y |

## Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| C | HS-C.9.1 | Express reasoning about transformations of functions.<br>Content scope: F-BF.3, limited to linear and quadratic functions. Tasks will not involve ideas of even or odd functions. | - | MP.3 | Y |
| C | HS-C.10.1 | Express reasoning about linear and exponential growth.<br>Content scope: F-LE.1a | - | MP.3 | Y |
| C | HS-C.12.1 | Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions<br>Content scope: F-IF.8a | i) Tasks involve using algebra to prove properties of given functions. For example, prove algebraically that the function $h(t) = t(t-1)$ has minimum value $\frac{1}{4}$; prove algebraically that the graph of $g(x) = x^2 - x + \frac{1}{4}$ is symmetric about the line $x = \frac{1}{2}$; prove that $x^2 + 1$ is never less than $-2x$.<br>ii) Scaffolding is provided to ensure tasks have appropriate level of difficulty. (For example, the prompt could show the graphs of $x^2 + 1$ and $-2x$ on the same set of axes, and say, "From the graph, it looks as if $x^2 + 1$ is never less than $-2x$. In this task, you will use algebra to prove it." And so on, perhaps with additional hints or scaffolding.)<br>iii) Tasks may have a mathematical or real-world context. | MP.3 | Y |
| C | HS-C.16.2 | Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any). Tasks are limited to quadratic equations.<br>Content scope: A-REI.1, A-REI.4a, A-REI.4b, limited to real solutions only. | - | MP.3, MP.6 | Y |
| C | HS-C.18.1 | Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about linear equations in one or two variables.<br>Content scope: 8.EE.B | i) For both Algebra1 and Math 1, we are revisiting content initially introduced in grade 8, from a more mature reasoning perspective. | MP.3, MP.6 | Y |

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Z – Calculator Neutral (Could Be on Calculator or Non-Calculator Sections

# Algebra I Evidence Statements

Type I Type II Type III

| Sub-Claim | Evidence Statement Key | Evidence Statement Text | Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks | Relationship to MPs | Calculator* |
|---|---|---|---|---|---|
| **Sub-claim D (15 of 55 points)** | | | | | |
| D | HS-D.1-1 | Solve multi-step contextual problems with degree of difficulty appropriate to the course, requiring application of knowledge and skills articulated in 7.RP.A, 7.NS.3, 7.EE, and/or 8.EE. | - | MP.4, may involve MP 1, MP.2, MP.5 | Y |
| D | HS-D.2-5 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q, A-SSE.3, A-REI.6, A-REI.12, A-REI.11-1, limited to linear equations and exponential equations with integer exponents. | i) A-CED is the primary content; other listed content elements may be involved in tasks as well. | MP.2, MP.4 | Y |
| D | HS-D.2-6 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q.2, A-SSE.3, A-REI.6, A-REI.12, A-REI.11-1, limited to linear and quadratic equations. | i) A-CED is the primary content; other listed content elements may be involved in tasks as well. | MP.2, MP.4 | Y |
| D | HS-D.2-8 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers. | i) F-BF.1a is the primary content; other listed content elements may be involved in tasks as well. | MP.2, MP.4 | Y |
| D | HS-D.2-9 | Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear and quadratic functions. | i) F-BF.1a is the primary content; other listed content elements may be involved in tasks as well. | MP.2, MP.4 | Y |
| D | HS-D.3-1a | Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature).<br>Content Scope: Knowledge and skills articulated in the Algebra I Type I, Sub-Claim A Evidence Statements. | - | MP.4, may involve MP 1, MP.2, MP.5, MP.7 | Y |
| D | HS-D.3-3a | Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity.<br>Content Scope: Knowledge and skills articulated in the Algebra I Type I, Sub-Claim A Evidence Statements. | - | MP.4, may involve MP 1, MP.2, MP.5, MP.7 | Y |

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