# ALGEBRA I Performance Level Descriptors

**Algebra I: Content (Sub-Claim A)**

The student solves problems involving the Major Content for the grade/course with connections to the Standards for Mathematical Practice.

<table>
<thead>
<tr>
<th>Exceeds Expectations</th>
<th>Meets Expectations</th>
<th>Approaches Expectations</th>
<th>Partially or Does Not Yet Meet Expectations</th>
</tr>
</thead>
</table>

### Expressions: A-SSE.1, A-SSE.1-2, A-SSE.2-1, A.APR.1-1

- **W**rites and **a**nalyzes equivalent numerical and polynomial expressions in one variable, using addition, subtraction, multiplication and factoring, **i**ncluding **m**ulti-step problems.
- **W**rites equivalent numerical and polynomial expressions in one variable, using addition, subtraction, multiplication and factoring.
- **W**rites equivalent numerical and polynomial expressions in one variable, using addition and subtraction and multiplication.
- **W**rites equivalent numerical and polynomial expressions in one variable, using addition, subtraction and multiplication.

### Interprets parts of complicated exponential and quadratic expressions that represent a quantity in terms of its context.

- **I**nterprets parts of exponential and quadratic expressions that represent a quantity in terms of its context.
- **I**dentifies components of exponential and quadratic expressions.
- **I**dentifies components of exponential expressions.

**Interpreting Functions:** F-IF.1, F-IF.2, F-IF.A.Int.1, F-IF.4-1, F-IF.5-1, F-IF.5-2, F.Int.1-1 S.ID.Int.1

- **D**etermines if a given relation is a function.
- **D**etermines if a given relation is a function.
- **D**etermines if a given relation is a function.
- **D**etermines if a given relation is a function.

- **E**valuates with, uses and interprets with function notation within a context.
- **E**valuates with and uses function notation within a context.
- **E**valuates with and uses function notation.
- **E**valuates with and uses function notation.

- **G**iven a context, writes and analyzes a linear or quadratic function.
- **G**iven a context, writes a linear function.
- **G**iven a context, writes a linear function.
- **G**iven a context, writes a linear function.

- **F**or linear and quadratic functions that model contextual relationships, determines and interprets key features, graphs the function and solves problems.
- **F**or linear and quadratic functions that model contextual relationships, determines key features and graphs the function.
- **F**or linear and quadratic functions that model contextual relationships, determines key features.
- **G**iven the graph of linear functions that model contextual relationships, determines key features.

- **D**etermines the domain and relates it to the quantitative relationship it describes for linear, quadratic, exponential (limited to domains in

- **D**etermines the domain and relates it to the quantitative relationship it describes for linear, quadratic and

- **D**etermines the domain of linear and quadratic functions.
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<tbody>
<tr>
<td>the integers), square root, cube root, piece-wise, step and absolute value functions.</td>
<td>exponential (limited to domains in the integers) functions.</td>
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</tr>
<tr>
<td>Rate of Change: F-IF.6-1a, F-IF.6-1b, F-IF.6-6a, F-IF.6-6b</td>
<td>Calculates and interprets the average rate of change of linear, exponential, quadratic, square root, cube root and piecewise-defined functions (presented symbolically or as a table) over a specified interval and estimate the rate of change from a graph.</td>
<td>Calculates the average rate of change of linear, exponential and quadratic functions (presented symbolically or as a table) over a specified interval and estimate the rate of change from a graph.</td>
<td>Calculates the average rate of change of linear, exponential and quadratic functions (presented as a table) over a specified interval.</td>
</tr>
<tr>
<td>Compares rates of change associated with different intervals.</td>
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<tr>
<td>Solving Algebraically: A-REI.3, A-REI.4a-1, A-REI.4b-1, A.REI.4b-2, A-CED.4-1, A-CED.4-2, HS-Int.1, HS-Int.2, HS-Int.3-2</td>
<td>Algebraically solves linear equations, linear inequalities and quadratics in one variable (at complexity appropriate to the course), including those with coefficients represented by letters.</td>
<td>Algebraically solves linear equations, linear inequalities and quadratics in one variable (at complexity appropriate to the course).</td>
<td>Algebraically solves linear equations and linear inequalities in one variable (at complexity appropriate to the course).</td>
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<tr>
<td>Utilizes structure and rewriting as strategies for solving.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Graphs the solution sets of equations and linear inequalities.</td>
</tr>
</tbody>
</table>
**Algebra I: Content (Sub-Claim A)**

The student solves problems involving the Major Content for the grade/course with connections to the Standards for Mathematical Practice.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Finds the solutions to two polynomial functions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations.</td>
<td>Finds the solutions to two polynomial functions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations.</td>
<td>Finds the solutions to two polynomial functions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations.</td>
<td>Given the graph, identify the solutions of a system of two polynomial functions.</td>
</tr>
<tr>
<td><strong>Writes a system of linear inequalities given a context.</strong></td>
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</tr>
</tbody>
</table>
## Algebra I: Content (Sub-Claim B)

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

<table>
<thead>
<tr>
<th>Exceeds Expectations</th>
<th>Meets Expectations</th>
<th>Approaches Expectations</th>
<th>Partially or Does Not Yet Meet Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number Systems:</strong></td>
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<tr>
<td>N-RN.B-1</td>
<td>Identifies rational and irrational numbers.</td>
<td>Identifies rational and irrational numbers.</td>
<td>Identifies rational and irrational numbers.</td>
</tr>
<tr>
<td></td>
<td>Calculates sums and products of two rational and/or irrational numbers and determines whether and generalizes when the sums and products are rational or irrational.</td>
<td>Calculates sums and products of two rational and/or irrational numbers.</td>
<td></td>
</tr>
<tr>
<td><strong>Equivalent Expressions and Functions:</strong></td>
<td>A-SSE.3a, A-SSE.3b, A-SSE.3c-1, F.IF.8a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determines equivalent forms of quadratic and exponential (with integer domain) expressions and functions to reveal and explain their properties.</td>
<td>Determines equivalent forms of quadratic expressions and functions.</td>
<td>Identifies equivalent forms of quadratic expressions and functions in cases where suitable factorizations are provided.</td>
</tr>
<tr>
<td></td>
<td>Uses equivalent forms to reveal and explain zeros, extreme values and symmetry.</td>
<td>Identifies zeros and symmetry.</td>
<td></td>
</tr>
<tr>
<td><strong>Interpreting Graphs of Functions:</strong></td>
<td>A-APR.3-1, F-I.F.7a-1, F-IF.7a-2 F-IF.7b</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graphs linear, quadratic, cubic (in which linear and quadratic factors are available), square root, cube root and piecewise-defined functions, showing key features.</td>
<td>Graphs linear, quadratic and cubic (in which linear and quadratic factors are available) functions, showing key features.</td>
<td>Graphs linear functions, showing key features.</td>
</tr>
<tr>
<td></td>
<td>Identifies a function, given a graph with key features identified.</td>
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<td></td>
</tr>
<tr>
<td><strong>Function Transformations:</strong></td>
<td>F-BF.3-1, F-BF.3-4</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Identifies the effects of multiple transformations on graphs of linear</td>
<td>Identifies the effects of a single transformation on graphs of linear</td>
<td>Identifies the effects of a single transformation on graphs of linear</td>
</tr>
</tbody>
</table>

October 2018
### ALGEBRA I

**Performance Level Descriptors**

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

<table>
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</thead>
<tbody>
<tr>
<td>and quadratic functions and finds the value of $k$ given a transformed graph.</td>
<td>and quadratic functions, including $f(x)+k$, $kf(x)$, and $f(x+k)$, and finds the value of $k$ given a transformed graph.</td>
<td>and quadratic functions, limited to $f(x)+k$ only.</td>
<td>and quadratic functions, limited to $f(x)+k$.</td>
</tr>
</tbody>
</table>

Experiments with cases using technology.

Given the equation of a transformed linear or quadratic function, creates an appropriate graph.

**Multiple Representations of Functions:** A-REI.6-1, F-LE.2-1, F-LE.2-2, F-IF.9-1, F-Int.1-1, S-ID.Int.1, S-ID.Int.2, HS-Int.1, HS-Int.2, HS-Int.3-1, HS-Int.3-2

- **Writes and analyzes** systems of linear equations in multi-step contextual problems.
- **Represents** linear and exponential functions symbolically, in real-life scenarios, graphically, with a verbal description, as a sequence and with input-output pairs to solve mathematical and contextual problems.
- Compares the properties of two functions represented in different ways, limited to linear, quadratic, exponential (with domains in the integers), square root, absolute value cube root, piecewise and step.

**Writing and Mathematical Problems:**

- **Represents** linear and exponential (with domain in the integers) functions symbolically, graphically, with a verbal description, as a sequence and with input-output pairs to solve mathematical problems.
- Compares the properties of two functions represented in different ways, limited to linear, quadratic, and exponential (with domains in the integers).

**Writing and Mathematical Problems:**

- **Compares the properties of two functions represented in different ways, limited to linear and quadratic.**
**Summarizing Representing and Interpreting Data**:

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<tbody>
<tr>
<td><strong>Summarizing Representing and Interpreting Data: S-ID.5, S-ID.Int.1 S-ID.Int.2</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Determines appropriate representations of categorical and quantitative data, summarizing and interpreting the data and characteristics of the representations.</td>
<td><strong>Determines appropriate representations of categorical and quantitative data, summarizing the data and characteristics of the representations.</strong></td>
<td>Given representations of categorical and quantitative data, <strong>summarizes the data</strong> and characteristics of the representations.</td>
<td>Given representations of categorical and quantitative data, describes the characteristics of the representations.</td>
</tr>
<tr>
<td><strong>Describes and interprets possible associations and trends in the data.</strong></td>
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</table>
### Algebra I: Reasoning (Sub-Claim C)

In connection with content, the student expresses course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

<table>
<thead>
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</tr>
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</table>

#### Exceeds Expectations

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student clearly constructs and communicates a complete response based on:
- the principle that a graph of an equation in two variables is the set of all its solutions
- reasoning about linear and exponential growth
- properties of rational numbers or irrational numbers
- transformations of functions
- a chain of reasoning to justify or refute algebraic, function, or linear-equation propositions or conjectures
- a given equation or system of equations
- the number or nature of solutions
  - using a logical approach based on a conjecture and/or stated assumptions, utilizing mathematical connections (when appropriate) providing an efficient and logical

#### Meets Expectations

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student clearly constructs and communicates a response based on:
- the principle that a graph of an equation in two variables is the set of all its solutions
- reasoning about linear and exponential growth
- properties of rational numbers or irrational numbers
- transformations of functions
- a chain of reasoning to justify or refute algebraic, function, or linear-equation propositions or conjectures
- a given equation or system of equations
- the number or nature of solutions
  - using a logical approach based on a conjecture and/or stated assumptions, utilizing mathematical connections (when appropriate)

#### Approaches Expectations

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student constructs and communicates a partial response based on:
- the principle that a graph of an equation in two variables is the set of all its solutions
- reasoning about linear and exponential growth
- properties of rational numbers or irrational numbers
- transformations of functions
- a chain of reasoning to justify or refute algebraic, function, or linear-equation propositions or conjectures
- a given equation or system of equations
- the number or nature of solutions
  - using a logical approach based on a conjecture and/or stated assumptions, utilizing mathematical connections (when appropriate)

#### Partially or Does Not Yet Meet Expectations

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student constructs and communicates an incomplete response based on:
- the principle that a graph of an equation in two variables is the set of all its solutions
- reasoning about linear and exponential growth
- properties of rational numbers or irrational numbers
- transformations of functions
- a chain of reasoning to justify or refute algebraic, function or linear-equation propositions or conjectures
- a given equation or system of equations
- the number or nature of solutions
  - using an approach based on a conjecture and/or stated or faulty assumptions
  - providing an incomplete or illogical progression of steps or chain of reasoning
**Algebra I: Reasoning (Sub-Claim C)**

In connection with content, the student expresses course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

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<tbody>
<tr>
<td>progression of steps or chain of reasoning with appropriate justification</td>
<td>o providing a logical progression of steps or chain of reasoning with appropriate justification</td>
<td>o performing minor calculation errors</td>
<td>o making an intrusive calculation error</td>
</tr>
<tr>
<td>o performing precise calculations</td>
<td>o performing precise calculations</td>
<td>o using some grade-level vocabulary, symbols and labels</td>
<td>o using limited grade-level vocabulary, symbols and labels</td>
</tr>
<tr>
<td>o using correct grade-level vocabulary, symbols and labels</td>
<td>o using correct grade-level vocabulary, symbols and labels</td>
<td>o providing a partial justification of a conclusion based on own calculations</td>
<td>o providing a partial justification of a conclusion based on own calculations</td>
</tr>
<tr>
<td>o providing a justification of a conclusion</td>
<td>o providing a justification of a conclusion</td>
<td>o evaluating the validity of others’ approaches and conclusions</td>
<td></td>
</tr>
<tr>
<td>o determining whether an argument or conclusion is generalizable</td>
<td>o evaluating, interpreting and critiquing the validity of others’ responses, approaches and reasoning – utilizing mathematical connections (when appropriate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o evaluating, interpreting and critiquing the validity of others’ responses, approaches and reasoning – utilizing mathematical connections (when appropriate)</td>
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<tr>
<td>o providing a counter-example where applicable</td>
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</tbody>
</table>
**Algebra I: Modeling (Sub-Claim D)**

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using state assumptions and approximations to simplify a real-world situation (includes micro-models)
- mapping relationships between important quantities
- selecting appropriate tools to create models
- analyzing relationships mathematically between important quantities to draw conclusions
- interpreting mathematical results in the context of the situation
- reflecting on whether the results make sense
- improving the model if it has not served its purpose
- using proportional reasoning and percentages
- using functions to describe how one quantity of interest depends on another
- using statistics

### Performance Level Descriptors

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<tbody>
<tr>
<td>Modeling: HS.D.1-1, HS.D.2-5, HS.D.2-6, HS.D.2-8, HS.D.2-9, HS.D.3-1a, HS.D.3-3a</td>
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</tbody>
</table>

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using state assumptions and approximations to simplify a real-world situation
- illustrating relationships between important quantities
- using provided tools to create models
- analyzing relationships mathematically between important quantities to draw conclusions
- interpreting mathematical results in a simplified context
- reflecting on whether the results make sense
- modifying the model if it has not served its purpose
- identifying important quantities
- using provided tools to create models
- analyzing relationships mathematically to draw conclusions
- writing an algebraic expression or equation to describe a situation
- applying proportional reasoning and percentages
- using functions to describe how one quantity of interest depends on another
- using statistics
**Algebra I: Modeling (Sub-Claim D)**

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning.

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<tr>
<td>• reflecting on whether the results make sense</td>
<td>• writing a complete, clear and correct algebraic expression or equation to describe a situation</td>
<td>• writing an algebraic expression or equation to describe a situation</td>
<td>• using estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
</tr>
<tr>
<td>• improving the model if it has not served its purpose</td>
<td>• applying proportional reasoning and percentages</td>
<td>• applying proportional reasoning and percentages</td>
<td></td>
</tr>
<tr>
<td>• writing a complete, clear and correct algebraic expression or equation to describe a situation</td>
<td>• writing and using functions in any form to describe how one quantity of interest depends on another</td>
<td>• writing and using functions to describe how one quantity of interest depends on another</td>
<td></td>
</tr>
<tr>
<td>• applying proportional reasoning and percentages justifying and defending models which lead to a conclusion</td>
<td>• using statistics</td>
<td>• using statistics</td>
<td></td>
</tr>
<tr>
<td>• using functions in any form to describe how one quantity of interest depends on another</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td></td>
</tr>
<tr>
<td>• using statistics</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
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</tr>
<tr>
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</tr>
<tr>
<td><strong>Congruence Transformations: G-CO.6, G-CO.C</strong></td>
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</tr>
<tr>
<td><strong>Determines and uses appropriate geometric theorems and properties of rigid motions, lines, angles, triangles and parallelograms to solve problems and prove statements about angle measurement, triangles, distance, line properties and congruence.</strong></td>
<td><strong>Uses given geometric theorems and properties of rigid motions, lines, angles, triangles and parallelograms to solve routine problems and prove statements about angle measurement, triangles, distance, line properties and congruence.</strong></td>
<td><strong>Uses given geometric theorems and properties of rigid motions, lines, angles, triangles and parallelograms to solve routine problems and reason about angle measurement, triangles, distance, line properties and congruence.</strong></td>
<td><strong>Uses given geometric theorems and properties of rigid motions, lines, angles, triangles and parallelograms to solve routine problems.</strong></td>
</tr>
<tr>
<td><strong>Similarity: G-SRT.1a, G-SRT.1b, G-SRT.2, G-SRT.5</strong></td>
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</tr>
<tr>
<td><strong>Uses transformations and congruence and similarity criteria for triangles to prove relationships among simple geometric figures and to solve problems.</strong></td>
<td><strong>Uses transformations to determine relationships among simple geometric figures and to solve problems.</strong></td>
<td><strong>Identifies transformation relationships in simple geometric figures.</strong></td>
<td><strong>Identifies transformation relationships in simple geometric figures in cases where an image is provided.</strong></td>
</tr>
<tr>
<td><strong>Similarity in Trigonometry: G-SRT.6, G-SRT.7–2, G-SRT.8</strong></td>
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</tr>
<tr>
<td><strong>Uses trigonometric ratios, the Pythagorean Theorem and the relationship between sine and cosine to solve right triangles in applied problems.</strong></td>
<td><strong>Uses trigonometric ratios, the Pythagorean Theorem and the relationship between sine and cosine to solve right triangles in applied problems.</strong></td>
<td><strong>Uses trigonometric ratios and the Pythagorean Theorem to determine the unknown side lengths and angle measurements of a right triangle.</strong></td>
<td><strong>Uses trigonometric ratios and the Pythagorean Theorem to determine the unknown side lengths of a right triangle.</strong></td>
</tr>
<tr>
<td><strong>Uses similarity transformations with right triangles to define trigonometric ratios for acute angles.</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Modeling and Applying: G-SRT.7–2, G-SRT.8, G-GPE.6 G-Int.1</strong></td>
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</tr>
<tr>
<td><strong>Uses geometric relationships in the coordinate plane to solve problems involving area, perimeter and ratios of lengths.</strong></td>
<td><strong>Uses geometric relationships in the coordinate plane to solve problems involving area, perimeter and ratios of lengths.</strong></td>
<td><strong>Uses provided geometric relationships in the coordinate plane to solve problems involving area and perimeter.</strong></td>
<td><strong>Uses provided geometric relationships in the coordinate plane to solve problems involving area and perimeter.</strong></td>
</tr>
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</tr>
<tr>
<td>Applies geometric concepts and trigonometric ratios to describe, model and solve applied problems (including design problems) related to the Pythagorean Theorem, density, geometric shapes, their measures and properties.</td>
<td>Applies geometric concepts to describe, model and solve applied problems related to the Pythagorean Theorem, geometric shapes, their measures and properties.</td>
<td>Applies geometric concepts to describe, model and solve applied problems related to the Pythagorean Theorem, geometric shapes, their measures and properties.</td>
<td>Applies geometric concepts to describe, model and solve applied problems related to geometric shapes, their measures, and properties.</td>
</tr>
<tr>
<td>Geometry: Content (Sub-Claim B)</td>
<td>Exceeds Expectations</td>
<td>Meets Expectations</td>
<td>Approaches Expectations</td>
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<td>--------------------------------</td>
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<tr>
<td><strong>Transformations: G–CO.1, G–CO.3, G–CO.5</strong></td>
<td>Given a figure and a sequence of transformations, draws the transformed figure.</td>
<td>Given a figure and a transformation, draws the transformed figure.</td>
<td>Given a figure and a transformation, draws the transformed figure.</td>
</tr>
<tr>
<td><strong>Uses precise geometric terminology to specify a sequence of transformations that will carry a figure onto itself or another.</strong></td>
<td>Specifies a sequence of transformations that will carry a figure onto another.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Geometric Constructions: G–CO.D</strong></td>
<td>Understands geometric constructions: copying a segment, copying an angle, bisecting an angle, bisecting a segment, including the perpendicular bisector of a line segment.</td>
<td>Understands geometric constructions: copying a segment, copying an angle, bisecting an angle, bisecting a segment, including the perpendicular bisector of a line segment.</td>
<td>Understands basic geometric constructions: copying a segment, copying an angle, bisecting an angle, bisecting a segment, including the perpendicular bisector of a line segment.</td>
</tr>
<tr>
<td></td>
<td>Given a line and a point not on the line, uses a variety of tools and methods to construct perpendicular and parallel lines.</td>
<td>Given a line and a point not on the line, constructs perpendicular and parallel lines.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uses a variety of tools and methods to construct equilateral triangles, squares, and hexagons inscribed in circles.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Applying Geometric Properties and Theorems: G–C.2, G–C.B, G–GPE.1–1, G–GPE.1–2</strong></td>
<td>Applies properties and theorems of angles, segments and arcs in circles to solve problems and model relationships.</td>
<td>Applies properties and theorems of angles, segments and arcs in circles to solve problems.</td>
<td>Applies properties and theorems of angles, segments and arcs in circles to solve problems.</td>
</tr>
<tr>
<td>Geometry: Content (Sub-Claim B)</td>
<td>The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.</td>
<td></td>
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<tr>
<td>---------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td><strong>Exceeds Expectations</strong></td>
<td><strong>Meets Expectations</strong></td>
<td><strong>Approaches Expectations</strong></td>
<td><strong>Partially or Does Not Yet Meet Expectations</strong></td>
</tr>
<tr>
<td>Completes the square to find the center and radius of a circle given by an equation.</td>
<td>Completes the square to find the center and radius of a circle given by an equation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geometric Formulas: G-GMD.1, G-GMD.3, G-GMD.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Uses volume formulas to solve mathematical and contextual problems that involve cylinders, pyramids, cones and spheres.</strong></td>
<td>Using formulas, determines the volume of cylinders, pyramids, cones and spheres.</td>
<td>Using formulas, determines the volume of cylinders, pyramids, cones and spheres.</td>
<td>Using formulas, determines the volume of cylinders, pyramids, cones and spheres.</td>
</tr>
<tr>
<td>Uses dissection arguments, Cavalieri’s principle and informal limit arguments to support the formula for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.</td>
<td>Gives an informal argument for the formula for the circumference of a circle and area of a circle, including dissection arguments.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifies the shapes of two-dimensional cross-sections of three-dimensional objects and identifies three-dimensional objects generated by rotations of two-dimensional objects.</td>
<td>Identifies the shapes of two-dimensional cross-sections of three-dimensional objects.</td>
<td>Identifies the shapes of two-dimensional cross-sections of three-dimensional objects.</td>
<td>Identifies the shapes of two-dimensional cross-sections of three-dimensional objects, when cross sections are parallel or perpendicular to a base/face.</td>
</tr>
<tr>
<td>Exceeds Expectations</td>
<td>Meets Expectations</td>
<td>Approaches Expectations</td>
<td>Partially or Does Not Yet Meet Expectations</td>
</tr>
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</tr>
</tbody>
</table>

**In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student clearly constructs and communicates a complete response based on:**
- a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures
- geometric reasoning in a coordinate setting, OR
- a response to a multi-step problem, by:
  - using a logical approach based on a conjecture and/or stated assumptions, utilizing mathematical connections (when appropriate)
  - providing an efficient and logical progression of steps or chain of reasoning with appropriate justification
  - performing precise calculation
  - using correct grade-level vocabulary, symbols and labels
  - providing a justification of a conclusion

**In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student clearly constructs and communicates a partial response based on:**
- a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures
- geometric reasoning in a coordinate setting, OR
- a response to a multi-step problem, by:
  - using a logical approach based on a conjecture and/or stated assumptions
  - providing a logical, but incomplete, progression of steps or chain of reasoning
  - performing minor calculation errors
  - using some grade-level vocabulary, symbols and labels
  - providing a partial justification of a conclusion based on own calculations

**In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student constructs and communicates a partial response based on:**
- a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures
- geometric reasoning in a coordinate setting, OR
- a response to a multi-step problem, by:
  - using an approach based on a conjecture and/or stated or faulty assumptions
  - providing an incomplete or illogical chain of reasoning, or progression of steps
  - making an intrusive calculation error
  - using limited grade-level vocabulary, symbols and labels
  - providing a partial justification of a conclusion based on own calculations
Geometry: Reasoning (Sub-Claim C)

In connection with content, the student expresses course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>o determining whether an argument or conclusion is generalizable</td>
<td>o evaluating, interpreting and critiquing the validity of others’ responses, approaches and reasoning – utilizing mathematical connections (when appropriate).</td>
<td>o evaluating the validity of others’ approaches and conclusions</td>
<td></td>
</tr>
<tr>
<td>o evaluating, interpreting and critiquing the validity of others’ responses, approaches and reasoning – utilizing mathematical connections (when appropriate) – and providing a counter example where applicable.</td>
<td></td>
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</tr>
</tbody>
</table>
### Geometry: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning.

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</tr>
</thead>
<tbody>
<tr>
<td>Modeling: HS.D.1-2, HS.D.2-1, HS.D.2-2, HS.D.2-11, HS.D.3-2a, HS.D.3-4a</td>
<td></td>
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</tr>
</tbody>
</table>

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and making assumptions and approximations to simplify a real-world situation (includes micro-models)
- mapping relationships between important quantities
- selecting appropriate tools to create models
- analyzing relationships mathematically between important quantities to draw conclusion
- analyzing and/or creating constraints, relationships and goals
- interpreting mathematical results in the context of the situation

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- illustrating relationships between important quantities
- using provided tools to create models
- analyzing relationships mathematically between important quantities to draw conclusions
- interpreting mathematical results in a simplified context
- reflecting on whether the results make sense
- modifying the model if it has not served its purpose

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- identifying important quantities
- using provided tools to create models
- analyzing relationships mathematically to draw conclusions
- writing an algebraic expression or equation to describe a situation
- applying proportional reasoning and percentages
- applying common geometric principles and theorems
- using functions to describe how one quantity of interest depends on another

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- illustrating relationships between important quantities
- using provided tools to create models
- analyzing relationships mathematically between important quantities to draw conclusions
- interpreting mathematical results in a simplified context
- reflecting on whether the results make sense
- modifying the model if it has not served its purpose

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- identifying important quantities
- using provided tools to create models
- analyzing relationships mathematically to draw conclusions
- writing an algebraic expression or equation to describe a situation
- applying proportional reasoning and percentages
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In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- illustrating relationships between important quantities
- using provided tools to create models
- analyzing relationships mathematically between important quantities to draw conclusions
- interpreting mathematical results in a simplified context
- reflecting on whether the results make sense
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In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
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- using provided tools to create models
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In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
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- using provided tools to create models
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- identifying important quantities
- using provided tools to create models
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- using stated assumptions and approximations to simplify a real-world situation
- illustrating relationships between important quantities
- using provided tools to create models
- analyzing relationships mathematically between important quantities to draw conclusions
- interpreting mathematical results in a simplified context
- reflecting on whether the results make sense
- modifying the model if it has not served its purpose

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- identifying important quantities
- using provided tools to create models
- analyzing relationships mathematically to draw conclusions
- writing an algebraic expression or equation to describe a situation
- applying proportional reasoning and percentages
- applying common geometric principles and theorems
- using functions to describe how one quantity of interest depends on another
### Geometry: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning.

<table>
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</thead>
<tbody>
<tr>
<td>• reflecting on whether the results make sense</td>
<td>• <strong>improving</strong> the model if it has not served its purpose</td>
<td>• writing an algebraic expression or equation to describe a situation</td>
<td>• using estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
</tr>
<tr>
<td>• improving the model if it has not served its purpose</td>
<td>• writing a <strong>complete, clear and correct</strong> algebraic expression or equation to describe a situation</td>
<td>• applying proportional reasoning and percentages</td>
<td></td>
</tr>
<tr>
<td>• writing a complete, clear and correct algebraic expression or equation to describe a situation</td>
<td>• applying geometric principles and theorems</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td></td>
</tr>
<tr>
<td>• applying proportional reasoning and percentages justifying and defending models which lead to a conclusion</td>
<td>• writing and using functions <strong>in any form</strong> to describe how one quantity of interest depends on another</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td></td>
</tr>
<tr>
<td>• applying geometric principles and theorems</td>
<td>• writing and using functions <strong>in any form</strong> to describe how one quantity of interest depends on another</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td></td>
</tr>
<tr>
<td>• writing and using functions in any form to describe how one quantity of interest depends on another</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td></td>
</tr>
<tr>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</td>
<td></td>
</tr>
<tr>
<td><strong>Algebra II: Content (Sub-Claim A)</strong></td>
<td><strong>Exceeds Expectations</strong></td>
<td><strong>Meets Expectations</strong></td>
<td><strong>Approaches Expectations</strong></td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Equivalent Expressions:</strong> N–RN.2 A.Int.1, A–REI.2, A–SSE.2–3, A–SSE.2–6, A–SSE.3c–2</td>
<td>Uses mathematical properties and structure of polynomial, exponential, rational and radical expressions to create equivalent expressions that aid in solving mathematical and contextual problems.</td>
<td>Uses mathematical properties and structure of polynomial, exponential and rational expressions to create equivalent expressions.</td>
<td>Uses provided mathematical properties and structure of polynomial and exponential expressions to create equivalent expressions.</td>
</tr>
<tr>
<td>Rewrites exponential expressions to reveal quantities of interest that may be useful.</td>
<td>Rewrites exponential expressions to reveal quantities of interest that may be useful.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpreting Functions:</strong> A–APR.2, A–REI.11–2, F–IF.4–2, F.Int.1–2</td>
<td>Uses mathematical properties and relationships to reveal key features of polynomial, exponential, rational, trigonometric and logarithmic functions, using them to sketch graphs and identify characteristics of the relationship between two quantities, and applying the remainder theorem where appropriate.</td>
<td>Interprets key features of graphs and tables, and uses mathematical properties and relationships to reveal key features of polynomial, exponential and rational functions, using them to sketch graphs.</td>
<td>Uses provided mathematical properties and relationships to reveal key features of polynomial and exponential functions, using them to sketch graphs.</td>
</tr>
<tr>
<td><strong>Rate of Change:</strong> F–IF.6–2, F–IF.6–</td>
<td>Calculates and interprets the average rate of change of polynomial, exponential, logarithmic or trigonometric functions (presented symbolically or as a table) over a specified interval, and estimates the rate of change from a graph.</td>
<td>Calculates the average rate of change of polynomial and exponential functions (presented symbolically or as a table) over a specified interval.</td>
<td>Calculates the average rate of change of polynomial and exponential functions (presented symbolically or as a table) over a specified interval.</td>
</tr>
</tbody>
</table>
### Algebra II: Content (Sub-Claim A)
The student solves problems involving the Major Content for the grade/course with connections to the Standards for Mathematical Practice.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>estimates the rate of change from a graph.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compares rates of change associated with different intervals.</strong></td>
<td></td>
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</tr>
</tbody>
</table>

### Building Functions: A-SSE.4-2, F-BF.1b-1, F-BF.2 F.Int.1-2

| Builds functions that model mathematical and contextual situations, including those requiring trigonometric functions, sequences and combinations of these and other functions, and uses the models to solve, interpret and generalize about problems. | Builds functions that model mathematical and contextual situations, including those requiring trigonometric functions, sequences and combinations of these and other functions, and uses the models to solve and interpret problems. | Builds functions that model mathematical and contextual situations, limited to those requiring trigonometric functions, sequences and combinations of these and other functions, and uses the models to solve and interpret problems. | Identifies functions that model mathematical and contextual situations, limited to those requiring geometric sequences. |

### Statistics & Probability: S-IC.3-1

| Determines why a sample survey, experiment or observational study is most appropriate. | Determines whether a sample survey, experiment or observational study is most appropriate. | Identifies whether a given scenario represents a sample survey, experiment or observational study. | Identifies characteristics of a sample survey, experiment or observational study. |

### Given an inappropriate choice of a sample survey, experiment or observational study, identifies and supports the appropriate choice. Determines how to change the scenario to make the choice appropriate. | | | |

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October 2018
### Interpreting Functions

**Given multiple functions in different forms** (algebraically, graphically, numerically and by verbal description), writes multiple equivalent versions of the functions, and identifies and compares key features.

**Graphs exponential, polynomial, trigonometric, and logarithmic functions**, showing key features.

**Equivalent Expressions**: N-CN.1, N-CN.2 A-APR.6

**Rewrites simple rational expressions using inspection or long division.**

**Function Transformations**: F-BF.3-2, F-BF.3-3, F-BF.3-5

**Identifies the effects of multiple transformations on graphs of polynomial, exponential, logarithmic and trigonometric functions, and determines if the resulting function is even or odd.**

**Rewrites simple rational expressions using inspection.**

**Identifies the effects of a single transformation on graphs of polynomial, exponential, logarithmic and trigonometric function – including \( f(x)+k \), \( kf(x) \), \( f(kx) \), and \( f(x+k) \) – and determines if the resulting function is even or odd.**

### Approaches Expectations

**Given functions represented algebraically, graphically, numerically and by verbal description, writes multiple equivalent versions of the functions, and identifies key features.**

**Graphs polynomial functions, showing key features.**

### Partially or Does Not Yet Meet Expectations

**Given functions represented algebraically, graphically, numerically and by verbal description, identifies key features of the functions.**

**Uses commutative and associative properties to add and subtract complex numbers.**

**Identifies the effects of a single transformation on graphs of polynomial and exponential functions – limited to \( f(x)+k \) and \( kf(x) \) – and determines if the resulting function is even or odd.**
### Trigonometry: F-TF.1, F-TF.8-2

- **Given a trigonometric value and quadrant for an angle, utilizes the structure and relationships of trigonometry, including relationships in the unit circle, to identify other trigonometric values for that angle, and describes the relationship between the radian measure and the subtended arc in the circle.**


- **Solves multi-step contextual word problems involving linear, exponential, quadratic (with real or complex solutions) and trigonometric equations and systems of equations, using inverses where appropriate.**
- **Solves problems involving linear, exponential, quadratic (with real solutions) equations and systems of equations, using inverses where appropriate.**
- **Solves problems involving linear, exponential and quadratic (with real solutions) equations and systems of equations, using inverses where appropriate.**
- **Solves problems involving linear, exponential and quadratic (with real solutions) equations.**

### Constructs linear and exponential function models in multi-step contextual problems.

- **Constructs linear and exponential function models in multi-step contextual problems.**
- **Constructs linear and exponential function models in multi-step contextual problems with mathematical prompting.**
- **Constructs linear function models in multi-step contextual problems with mathematical prompting.**

### Data – Univariate and Bivariate: S-ID.4, S-ID.6a–1, S-ID.6a-2

- **Uses the means and standard deviations of data sets to fit them to normal distributions.**
- **Uses the means and standard deviations of data sets to fit them to normal distributions.**
- **Uses the means and standard deviations of data sets to fit them to normal distributions.**
- **Identifies the mean and standard deviation of a given normal distribution.**
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Fits exponential and <strong>trigonometric functions</strong> to data in order to solve multi-step contextual problems.</td>
<td><strong>Fits</strong> exponential functions <strong>to data</strong> in order to solve multi-step contextual problems.</td>
<td>Uses fitted exponential functions to solve multi-step contextual problems.</td>
<td></td>
</tr>
<tr>
<td><strong>Determines when models fitted to data are inappropriate.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inference:</strong> S-IC.2, S-IC.Int.1</td>
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</tr>
<tr>
<td>Uses sample data to make, <strong>justify, and critique inferences and conclusions</strong> about the corresponding population.</td>
<td><strong>Uses</strong> sample data to make inferences about the corresponding population.</td>
<td>Identifies when sample data can be used to make inferences about the corresponding population.</td>
<td>Identifies when sample data can be used to make inferences about the corresponding population.</td>
</tr>
<tr>
<td><strong>Decides if specified models are consistent with results from given data-generating processes.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Probability:</strong> S-CP.Int.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognizes, determines and uses conditional probability and independence in multi-step contextual problems, using appropriate set language and appropriate representations, including two-way frequency tables.</td>
<td>Recognizes, determines and uses conditional probability and independence in contextual problems, using appropriate set language and appropriate representations, including two-way frequency tables.</td>
<td>Recognizes and determines conditional probability and independence in contextual problems.</td>
<td>Recognizes and determines independence in contextual problems.</td>
</tr>
<tr>
<td><strong>Applies the Addition Rule of probability.</strong></td>
<td></td>
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</tbody>
</table>
### Algebra II: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

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In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student clearly constructs and communicates a **complete response** based on:
- a response to a given equation or system of equations
- a chain of reasoning to justify or refute algebraic, function or number system propositions or conjectures
- a response based on data
- a response based on the graph of an equation in two variables, the principle that a graph is a solution set or the relationship between zeros and factors of polynomials
- a response based on trigonometric functions and the unit circle
- a response based on transformations of functions

OR
- a response based on properties of exponents by:
  - using a logical approach based on a conjecture and/or stated

In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, the student clearly constructs and communicates a **partial response** based on:
- a response to a given equation or system of equations
- a chain of reasoning to justify or refute algebraic, function or number system propositions or conjectures
- a response based on data
- a response based on the graph of an equation in two variables, the principle that a graph is a solution set or the relationship between zeros and factors of polynomials
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OR
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- a response based on trigonometric functions and the unit circle
- a response based on transformations of functions

OR
- a response based on properties of exponents by:
## Algebra II: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statement.

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</table>
| - using a logical approach based on a conjecture and/or stated assumptions, utilizing mathematical connections (when appropriate)  
- providing an efficient and logical progression of steps or chain of reasoning with appropriate justification  
- performing precise calculations  
- using correct grade-level vocabulary, symbols and labels  
- providing a justification of a conclusion  
- determining whether an argument or conclusion is generalizable  
- evaluating, interpreting and critiquing the validity of others’ responses, approaches and reasoning – utilizing mathematical connections (when applicable) | - using assumptions, utilizing mathematical connections (when appropriate)  
- providing a logical progression of steps or chain of reasoning with appropriate justification  
- performing precise calculations  
- using correct grade-level vocabulary, symbols and labels  
- providing a justification of a conclusion  
- evaluating, interpreting and critiquing the validity of others’ responses, approaches and reasoning – utilizing mathematical connections (when appropriate) | - using a logical approach based on a conjecture and/or stated assumptions  
- providing a logical, but incomplete, progression of steps or chain of reasoning  
- performing minor calculation errors  
- using some grade-level vocabulary, symbols and labels  
- providing a partial justification of a conclusion based on own calculations  
- evaluating the validity of others’ approaches and conclusions. | - using an approach based on a conjecture and/or stated or faulty assumptions  
- providing an incomplete or illogical progression of steps or chain of reasoning  
- making an intrusive calculation error  
- using limited grade-level vocabulary, symbols and labels  
- providing a partial justification of a conclusion based on own calculations |
In connection with the content knowledge, skills, and abilities described in Sub-claims A and B, devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:

- using stated assumptions and approximations to simplify a real-world situation
- mapping relationships between important quantities
- selecting appropriate tools to create the appropriate model
- analyzing relationships mathematically between important quantities (either given or created) to draw conclusion
- interpreting mathematical results in the context of the situation
- reflecting on whether the results make sense
- improving the model if it has not served its purpose

<table>
<thead>
<tr>
<th>Exceeds Expectations</th>
<th>Meets Expectations</th>
<th>Approaches Expectations</th>
<th>Partially or Does Not Yet Meet Expectations</th>
</tr>
</thead>
</table>

- using stated assumptions and approximations to simplify a real-world situation
- illustrating relationships between important quantities
- using provided tools to create appropriate but inaccurate model
- analyzing relationships mathematically to draw conclusions
- writing an expression, equation or function to describe a situation
- using securely held content incompletely reporting a conclusion, with some inaccuracy within the reporting
## Algebra II: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning.

<table>
<thead>
<tr>
<th>Exceeds Expectations</th>
<th>Meets Expectations</th>
<th>Approaches Expectations</th>
<th>Partially or Does Not Yet Meet Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>writing a complete, clear and correct expression, equation or function to describe a situation</td>
<td>improving the model if it has not served its purpose</td>
<td>writing an expression, equation or function to describe a situation</td>
<td>indiscriminately using data from a data source</td>
</tr>
<tr>
<td>analyzing and/or creating constraints, relationships and goals</td>
<td>writing a complete, clear and correct expression, equation or function to describe a situation</td>
<td>using geometry to solve design problems</td>
<td>using securely held content incompletely reporting a conclusion, with some inaccuracies within the reporting</td>
</tr>
<tr>
<td>justifying and defending models which lead to a conclusion</td>
<td>using geometry to solve design problems</td>
<td>using securely held content, briefly, but accurately reporting the conclusion</td>
<td>indiscriminately using data from a data source</td>
</tr>
<tr>
<td>using geometry to solve design problems</td>
<td>using securely held content, briefly, but accurately reporting the conclusion</td>
<td>identifying and using relevant data from a data source</td>
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</tr>
<tr>
<td>using securely held content, accurately reporting and justifying the conclusion</td>
<td>identifying and using relevant data from a data source</td>
<td>making an appropriate evaluation or recommendation</td>
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<tr>
<td>identifying and using relevant data from a data source</td>
<td>making an appropriate evaluation or recommendation</td>
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