

**Claim 1: Concepts and Procedures.** Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

Focus	Target	Standards	Goal DOK	Relative Emphasis/ Comments	%
N-RN.A	<p>A. Extend the properties of exponents to rational exponents and work with radicals and integer exponents.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student rewrites expressions in radical form into an equivalent expression with rational exponents.</li> <li>The student rewrites expressions with rational exponents into an equivalent expression in radical form.</li> <li>The student uses the properties of exponents to write equivalent expressions involving radicals and rational exponents.</li> <li>The student states how many times as large or as small one number, written as a single digit times a power of 10, is than another, to estimate very large or very small quantities.</li> <li>The student performs operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.</li> </ol> <p><b>Focus:</b> Solve equations with square and cube roots, rewrite rational and radical expressions.</p>	N-RN.2	2	Low	65-75%
N-Q.A	<p>C. Reason quantitatively and use units to solve problems.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student chooses units consistently in formulas.</li> <li>The student chooses the scales for graphs and data displays.</li> </ol> <p><b>Focus:</b> Use and interpret units in real world and mathematical situations.</p>	N-Q.1	2	Medium	
A-SSE.A	<p>D. Interpret the structure of expressions.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student identifies key features of a function.</li> <li>The student uses the structure of an expression to identify ways of rewriting it.</li> </ol> <p><b>Focus:</b> Identify parts of a function and use properties of the function to help rewrite it.</p>	A-SSE.1, A-SSE.2	1	Medium	

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A-SSE.B	<p>E. Write expressions in equivalent forms to solve problems.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student factors a quadratic expression.</li> <li>The student understands that the factored form of a quadratic expression reveals the zeros of the function it defines.</li> <li>The student uses the properties of exponents to transform exponential expressions.</li> </ol> <p><b>Focus:</b> Factor quadratic expressions to reveal the zeros of a function.</p>	A-SSE.3	2	Medium	Claim 1 cont. 65-75%
A-APR.A	<p>F. Perform arithmetic operations on polynomials.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student adds or subtracts polynomials.</li> <li>The student multiplies polynomials.</li> </ol> <p><b>Focus:</b> Add, subtract, and multiply polynomials of degree 2 or more.</p>	A-APR.1	1	High	
A-CED-A	<p>G. Analyze and solve linear equations and pairs of simultaneous linear equations. Create equations that describe numbers or relationships.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student recognizes when a system of two linear equations in two variables has one solution, no solution, or infinitely many solutions.</li> <li>The student solves a system of two linear equations in two variables algebraically, or solves real-world and mathematical problems leading to two linear equations in two variables.</li> <li>The student creates one variable equations or inequalities arising from linear, quadratic, simple rational, and exponential functions in one variable.</li> <li>The student graphs equations or inequalities on coordinate axes with labels and scales to represent the solution to a contextual problem.</li> <li>The student creates equations in two or more variables to represent relationships between quantities.</li> </ol> <p><b>Focus:</b> Classify and solve linear systems, model with nonlinear equations and linear inequalities.</p>	A-CED.1, A-CED.2, A-CED.3, A-CED.4	2	High	

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A-REI.A	<p>H. Understand solving multi-step linear, simple radical, and simple rational equations as a process of reasoning and explain the reasoning.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student generates algebraic equations, can justify the solution, and explain the steps to solve the equation.</li> <li>The student represents solutions to equations of the form <math>x^2 = p</math> using square root symbols.</li> <li>The student represents solutions to equations of the form <math>x^3 = p</math> using cube root symbols.</li> <li>The student solves radical and/or simple rational equations in one variable, including identifying the number and type of real solutions that might exist for the equation (e.g., one, two, infinite, or no real).</li> <li>The student evaluates proposed solutions to radical or simple rational equations, and recognizes where extraneous solution(s) might arise during the solving of the equation.</li> </ol> <p><b>Focus:</b> Solve two-step linear, simple radical, and simple rational equations.</p>	A-REI.1, A-REI.2	2	Medium	Claim 1 cont. 65-75%
A-REI.B	<p>I. Solve linear and quadratic equations in one variable and linear inequalities in one variable.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student identifies and writes examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions.</li> <li>The student solves linear equations in one variable with rational number coefficients, including equations with solutions that require expanding expressions using the distributive property and collecting like terms.</li> <li>The student solves linear inequalities in one variable with numeric and letter coefficients or identifies appropriate value(s) of a letter coefficient given specific information about a variable in a linear equation or inequality.</li> <li>The student solves quadratic equations in one variable by taking square roots, using the quadratic formula, or by factoring.</li> </ol> <p><b>Focus:</b> Solve linear equations, quadratic equations, and linear inequalities in one variable. Determine the number of solutions for these types of equations.</p>	A-REI.3, A-REI.4	2	High	

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A-REI.D	<p>J. Represent and solve equations and inequalities graphically. Understand the connections between proportional relationships, lines, and linear equations and their graphs.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student compares proportional relationships represented in different formats and uses similar triangles to determine that the slope <math>m</math> is the same between any two distinct points on a non-vertical line in the coordinate plane.</li> <li>The student interprets the unit rate as the slope of the graph of a proportional relationship.</li> <li>The student finds the equation <math>y=mx</math> or <math>y=mx+b</math> for a line and interprets the equation as defining a linear function with a graph that is straight line.</li> <li>The student understands 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).</li> <li>The student graphs the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality).</li> <li>The student finds the solution(s) (either exact or approximate as appropriate) to a system of equations and graphs the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</li> </ol> <p><b>Focus:</b> Graph linear equations and inequalities in one or two variables and understand the solution set. Use the solution set in context to compare properties of lines such as comparing slopes to determine if a system has zero, one, or infinitely many solutions.</p>	A-REI.10, A-REI.11, A-REI.12	1	High	Claim 1 cont. 65-75%
F-IF.A	<p>K. Understand the concept of a function and use function notation.</p> <p><b>Evidence Required:</b></p> <ol style="list-style-type: none"> <li>The student recognizes functions that are not linear.</li> <li>The student understands that a function from one set (the domain) to another set (the range) assigns to each element of the domain exactly one element of the range (e.g., distinguish between functions and non-functions).</li> <li>The student identifies or evaluates a function to produce input and output pairs for given functions.</li> <li>The student recognizes any necessary restriction that needs to be placed on the domain in order for an equation to represent a function.</li> </ol> <p><b>Focus:</b> Understand domain, range, and any restrictions of these for a given function.</p>	F-IF.1, F-IF.2, F-IF.3	1	Low	

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F.IF.C	<p>M. Graph, compare, and analyze functions using different representations. Use functions to model relationships between quantities.</p> <ol style="list-style-type: none"> <li>1. The student graphs linear, quadratic, piecewise defined, and exponential functions by hand or using technology.</li> <li>2. The student determines the rate of change and initial value of a function, either from a description of a relationship or from two (x, y) values, including reading the rate of change and/or the value of the function from a table or a graph.</li> <li>3. The student identifies equivalent forms of a function represented in different ways.</li> <li>4. The student compares properties of two functions, each represented in a different way (e.g., as equations, functions, tables, graphs, or written descriptions).</li> <li>5. The student draws a graph that exhibits the qualitative features of a function that has been described in writing and shows key features of the graph.</li> <li>6. The student qualitatively describes the functional relationship between two quantities by analyzing a table or graph (e.g., whether the function is increasing or decreasing, or whether the graph is linear or nonlinear).</li> </ol>	F-IF.7, F-IF.8, F-IF.9	2	Medium	Claim 1 cont. 65-75%
F.BF.A	<p>N. Build a function that models a relationship between two quantities.</p> <ol style="list-style-type: none"> <li>1. The student identifies a sequence as arithmetic or geometric.</li> <li>2. The student writes an explicit formula for arithmetic and geometric sequences from numerical data from a context.</li> <li>3. The student writes a recursive formula for arithmetic and geometric sequences from numerical data and from a context.</li> <li>4. The student converts the explicit formula for an arithmetic sequence to slope-intercept form.</li> <li>5. The student translates between the explicit formula and the recursive formula of a sequence.</li> </ol>	F-BF.1, F-BF.2	2	Low	

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G-SRT.C	<p>O. Define trigonometric ratios and solve problems involving right triangles.</p> <ol style="list-style-type: none"> <li>1. The student uses the definitions of trigonometric ratios for acute angles in a right triangle.</li> <li>2. The student uses similar triangles to define and determine trigonometric ratios in right triangles.</li> <li>3. The student explains and uses the relationship between the sine and cosine of complementary angles.</li> <li>4. The student uses the Pythagorean Theorem and trigonometric ratios to solve problems involving right triangles in mathematical or real-world context.</li> </ol>	G-SRT.6, G-SRT.7, G-SRT.8	2	Medium	Claim 1 cont. 65-75%
S-ID.A	<p>P. Summarize, represent, and interpret data on a single count or measurement variable. Investigate patterns of association in bivariate data.</p> <ol style="list-style-type: none"> <li>1. The student interprets patterns of association between two quantities in a scatter plot (clustering in reference to the line of best fit, positive or negative association, linear association, nonlinear association, and the effect of outliers) and interprets the slope and y-intercept in terms of the context.</li> <li>2. The student identifies the slope (rate of change) and intercept (initial value) of a line suggested by examining bivariate measurement data in a scatter plot.</li> <li>3. The student constructs and interprets a two-way table summarizing data on two categorical variables collected from the same subjects.</li> <li>4. The student will be able to represent data on the real number line with a dot plot, histogram, or box plot.</li> <li>5. The student will be able to interpret the differences in shape, center, and spread in the context of the data sets and the effects of outliers.</li> </ol>	S-ID.1, S-ID.2, S-ID.3	2	High	

**Claim 2: Problem Solving.** Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problems solving strategies.

Focus	Target	Standard	Goal DOK	Relative Emphasis/ Comments	%
Not used in this grade.	<p><b>A-D</b></p> <p>A. Apply mathematics to solve well-posed problems in pure mathematics and arising in everyday life, society, and the workplace.</p> <p>B. Select and use appropriate tools strategically.</p> <p>C. Interpret results in the context of a situation.</p> <p>D. Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).</p>	<p>Focus Clusters:            N-Q.A, A-SSE.A,            A-SSE.B, A-CED.A,            A-REI.A, A-REI.B,            A-REI.D, F-IF.A,            F-IF.C, F-BF.A,            G-SRT.C</p>	3	<p>Tasks limited to machine-scorable responses, so not all Targets may be addressed.</p>	8-12%

**Claim 3: Communicating Reason.** Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of other.

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Not used in this grade.	<p><b>A-F</b></p> <p>A. Test propositions or conjectures with specific examples.</p> <p>B. Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures.</p> <p>C. State logical assumptions being used.</p> <p>D. Use the technique of breaking an argument into cases.</p> <p>E. Distinguish correct logic or reasoning from that which is flawed and—if there is a flaw in the argument— explain what it is.</p> <p>F. Base arguments on concrete referents such as objects, drawings, diagrams, and actions.</p>	<p>Focus Clusters/Standards:            N-RN.A, A-SSE.A,            A-APR.A, A-REI.A,            A-REI.1, A-REI.2,            A-REI.10, A-REI.11,            F-IF.1, F-IF.9</p>	3	Tasks limited to machine-scorable responses, so not all Targets may be addressed.	8-12%



**Claim 4: Modeling and Data Analysis.** Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

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	<p><b>A-G</b></p> <p>A. Apply mathematics to solve problems arising in everyday life, society, and the workplace.</p> <p>B. Construct, autonomously, chains of reasoning to justify mathematical models used, interpretations made, and solutions proposed for a complex problem.</p> <p>C. State logical assumptions being used.</p> <p>D. Interpret results in the context of a situation.</p> <p>E. Analyze the adequacy of and make improvements to an existing model or develop a mathematical model of a real phenomenon.</p> <p>F. Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).</p> <p>G. Identify, analyze, and synthesize relevant external resources to pose or solve problems. (performance tasks only)</p>	<p>Focus Clusters: N-Q.A, A-SSE.B, A-CED.A, A-REI.A, A-REI.B, F-IF.C, F-BF.A, S-ID.A</p>	<p>3</p>	<p>Tasks limited to machine-scorable responses, so not all Targets may be addressed.</p>	<p>8-12%</p>