

Descriptors by NRS Level

ABE Level 1

Assessment Ranges	
CASAS scale scores: • Reading GOALS: 203 and below	CASAS scale scores: • Math GOALS: 193 and below
Basic Reading and Writing	Numeracy Skills
<p>Reading: Individuals ready to exit the Beginning Literacy Level comprehend how print corresponds to spoken language and are able to demonstrate understanding of spoken words, syllables, and sound-letter relationships (phonetic patterns), including consonant digraphs and blends. In particular, students at this level are able to recognize and produce rhyming words, blend and segment onsets and rhymes, isolate and pronounce initial, medial, and final sounds, add or substitute individual sounds, and blend and segment single syllable words. They are able to decode two-syllable words following basic patterns as well as recognize common high frequency words by sight. Individuals are able to read simple decodable texts with accuracy, appropriate rate, and expression. They are able to determine the meaning of words and phrases in texts with clear and explicit context.</p> <p>Individuals ready to exit this level are able to determine main ideas, retell key details, and ask and answer questions about key details in simple texts. Individuals are also able to use the illustrations in the text(s), whether print or digital, to describe its key ideas (e.g., maps, charts, photographs, cartoons). They also are able to use text features, both print and digital, to locate key facts or information. When listening to text above their current independent reading level, they are able to identify the reasons an author gives to support points in a text, describe the connections between ideas within a text, and examine the basic similarities in and differences between two texts on the same topic.</p> <p>Writing: Individuals ready to exit the Beginning Literacy Level are able to write basic sight words and familiar words and phrases as they compose simple sentences or phrases. This includes writing simple informative texts in which they supply some facts about a topic and narratives that include some details regarding what happened. They use simple transition and temporal words to signal event order (e.g., so, and, because, when, next, finally). With support, they are able to gather and use information from provided sources, both print and digital, to answer a simple research question.</p>	<p>The Mathematical Practices: Students prepared to exit this level are able to decipher a simple problem presented in a context and reason about and apply correct units to the results. They can visualize a situation using manipulatives or drawings and explain their processes and results using mathematical terms and symbols appropriate for the level. They recognize errors in the work and reasoning of others. They are able to strategically select and use appropriate tools to aid in their work, such as pencil/paper, measuring devices, and/or manipulatives. They can see patterns and structure in sets of numbers and geometric shapes and use those insights to work more efficiently.</p> <p>Number Sense and Operations: Students prepared to exit this level have an understanding of whole number place value for tens and ones and are able to use their understanding of place value to compare two-digit numbers. They are able to add whole numbers within 100 and explain their reasoning. They are able to apply their knowledge of whole number addition and subtraction to represent and solve word problems that call for addition of three whole numbers whose sum is less than 20 by using such problem-solving tools as objects, drawings, and/or simple equations.</p> <p>Algebraic Thinking: Students prepared to exit this level understand and apply the properties of operations to addition and subtraction problems. They understand the relationship between the two operations and can determine the unknown number in addition or subtraction equations.</p> <p>Geometry and Measurement: Students prepared to exit this level can analyze and compare 2 and 3-dimensional shapes based on their attributes, such as their shape, size, orientation, the number of sides and/or vertices (angles), or the lengths of their sides. They can reason with two-dimensional shapes and with three-dimensional shapes to create composite shapes. They are able to measure the length of an object as a whole number of units, which are not necessarily standard units, for example measuring the length of a pencil using a paper clip as the length unit.</p> <p>Data Analysis: Students prepared to exit this level are able to organize, represent, and interpret simple data sets using up to three categories. They can answer basic questions related to the total number of data points in a set and the number of data points in each category, and can compare the number of data points in the different categories.</p>

ABE Level 2

Assessment Ranges	
CASAS scale scores: • Reading GOALS: 204–216	CASAS scale scores: • Math GOALS: 194–203
Basic Reading and Writing	Numeracy Skills
<p>Reading: Individuals ready to exit the Beginning Basic Level are able to decode multisyllable words, distinguish long and short vowels when reading regularly spelled one-syllable words, and recognize the spelling-sound correspondences for common vowel teams. They also are able to identify and understand the meaning of the most common prefixes and suffixes. They can read common irregular sight words. Individuals are able to read level appropriate texts (e.g., texts with a Lexile Measure of between 420 and 820) with accuracy, appropriate rate, and expression. They are able to determine the meaning of words and phrases in level-appropriate complex texts.</p> <p>Individuals ready to exit this level are able to determine main ideas, ask and answer questions about key details in texts and show how those details support the main idea. Individuals also are able to explain how specific aspects of both digital and print illustrations contribute to what is conveyed by the words of a text. They are able to compare and contrast the most important points and key details of two texts on the same topic. When listening to text above their current independent reading level, they are able to describe the relationship between ideas in a text in terms of time, sequence, and cause/effect, as well as use text features and search tools, both print and digital, to locate information relevant to a given topic efficiently. They also are able to describe how reasons support specific points an author makes in a text and identify the author’s main purpose or what the author wants to answer, explain or describe, as well as distinguish their own point of view from that of the author’s.</p> <p>Writing: Individuals ready to exit the Beginning Basic Level are able to write opinion pieces on topics or texts, supporting a point of view with reasons. They are able to write simple informative texts in which they examine a topic and convey information clearly. They also are able to write narratives with details that describe actions, thoughts, and feelings. They use transition and temporal words (e.g., also, another, more, but) to link ideas and signal event order. Individuals ready to exit this level are able to use technology to produce and publish writing as well as to interact and collaborate with others. They are able to conduct short research projects and summarize their learning in print. This includes taking brief notes from both print and digital sources, and sorting evidence into provided categories.</p>	<p>The Mathematical Practices: Students prepared to exit this level are able to decipher two-step problems presented in a context, visualizing a situation using diagrams or sketches, and reasoning about and applying the correct units and the proper degree of precision to the results. They can explain their processes and results using mathematical terms and symbols appropriate for the level and recognize errors in the reasoning of others. They strategically select and use the appropriate tools to aid in their work, such as pencil/paper, measuring devices, manipulatives, and/or calculators. They are able to see patterns and structure in sets of numbers, including in multiplication or addition tables, and use those insights to work more efficiently.</p> <p>Number Sense and Operations: Students prepared to exit this level understand place value for whole numbers to 1000 and can use that understanding to read, write, count, compare, and round three-digit whole numbers to the nearest 10 or 100. They are able to compute fluently with all four operations with whole numbers within 100. They use place value and properties of operations to explain why addition and subtraction strategies work, and can demonstrate an understanding of the inverse relationship between multiplication and division. They can solve one- and two-step word problems involving all four operations within 100 and identify and explain arithmetic patterns. They have an understanding of fractions, especially unit fractions, and can represent simple fractions on a number line. They understand and can explain equivalence of fractions, can recognize and generate simple equivalent fractions, and can compare two fractions with the same numerator or denominator by reasoning about their size.</p> <p>Algebraic Thinking: Students prepared to exit this level apply the properties of operations to multiplication and division of whole numbers. They understand the relationship between multiplication and division and can determine the unknown number in multiplication or division equations.</p> <p>Geometry and Measurement: Students prepared to exit this level understand geometric shapes and their attributes. They can demonstrate an understanding that different shapes might share common attributes and can compare and classify two-dimensional shapes. They are able to partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole. They can use common U.S. and metric units for linear measurements and solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. They understand the concept of area and can relate it to addition and multiplication to solve real-world problems. They understand, and can solve, real world and mathematical problems involving perimeter of polygons.</p> <p>Data Analysis: Students prepared to exit this level are able to draw and interpret simple graphs, including scaled bar and picture graphs. They can solve one- and two-step problems using scaled bar graphs. They can generate measurement data by measuring lengths to the nearest half- and quarter-inch and display that data by making a line plot marked off in appropriate units.</p>

ABE Level 3

Assessment Ranges	
<p>CASAS scale scores:</p> <ul style="list-style-type: none"> • Reading GOALS: 217–227 	<p>CASAS scale scores:</p> <ul style="list-style-type: none"> • Math GOALS: 204–214
Basic Reading and Writing	Numeracy Skills
<p>Reading: Individuals ready to exit the Low Intermediate Level are able to read fluently text of the complexity demanded of this level (e.g., a Lexile Measure of between 740 and 1010). They are able to use knowledge of letter-sound correspondences, syllabication patterns, and roots and affixes to accurately decode unfamiliar words. They are able to determine the meaning of words and phrases (e.g., metaphors and similes) in level-appropriate complex texts. Individuals ready to exit this level are able to make logical inferences, summarize central ideas or themes, and explain how they are supported by key details. They are able to explain events, procedures, or ideas in historical, scientific, or technical texts, including what happened and why. They are able to describe the overall structure of a text and compare and contrast the structures of two texts. Individuals ready to exit this level are also able to interpret information presented visually, orally or quantitatively to find an answer to a question or solve a problem. They display this facility with both print and digital media. Individuals are able to explain how authors use reasons and evidence to support particular points in a text and can integrate information from several texts, whether print, media, or a mix, on the same topic. They are able to describe how point of view influences how events are described. They are able to analyze multiple accounts of the same event or topic, noting similarities and differences. They are able to produce valid evidence for their findings and assertions.</p> <p>Writing: Individuals ready to exit the Low Intermediate Level are able to write opinion pieces on topics or texts, supporting a point of view with facts and logically ordered reasons. They are able to produce informative texts in which they develop a topic with concrete facts and details. They convey information clearly with precise language and well-organized paragraphs. They link ideas, opinions and reasons with words, phrases, and clauses (e.g., another, specifically, consequently, because). They are also able to use technology (including the Internet) to produce and publish writing as well as to interact and collaborate with others. They are able to conduct short research projects, making frequent use of on-line as well as print sources. This includes the ability to draw evidence from several texts to support an analysis. They are able to summarize or paraphrase information from and provide a list of those sources.</p>	<p>The Mathematical Practices: Students prepared to exit this level are able to decipher multistep problems presented in a context and reason about and apply the correct units and the proper degree of precision to the results. They can visualize a situation using diagrams or sketches, see multiple strategies for solving a problem, explain their processes and results, and recognize errors in the work and reasoning of others. They can express themselves using mathematical terms and notation appropriate for the level and can strategically select and use tools to aid in their work, such as pencil/paper, measuring devices, and/or technology. They are able to see patterns and structure in sets of numbers and geometric shapes and use those insights to work more efficiently.</p> <p>Number Sense and Operations: Students prepared to exit this level understand place value for both multi-digit whole numbers and decimals to thousandths, and use their understanding to read, write, compare, and round decimals. They are able to use their place value understanding and properties of operations to perform operations with multi-digit whole numbers and decimals. They can find common factors, common multiples, and understand fraction concepts, including fraction equivalence and comparison. They can add, subtract, multiply and divide with fractions and mixed numbers. They are able to solve multi-step word problems posed with whole numbers and fractions, using the four operations. They also have an understanding of ratio concepts and can use ratio language to describe a relationship between two quantities, including the concept of a unit rate associated with a ratio.</p> <p>Algebraic Thinking: Students prepared to exit this level are able to apply and extend their understanding of arithmetic to algebraic expressions, using a symbol to represent an unknown value. They can write, evaluate, and interpret expressions and equations, including expressions that arise from formulas used in real-world problems. They can solve real-world and mathematical problems by writing and solving simple one-variable equations and write a simple inequality that represents a constraint or condition in a real-world or mathematical problem. They can represent and analyze quantitative relationships between dependent and independent variables.</p> <p>Geometry and Measurement: Students prepared to exit this level have a basic understanding of the coordinate plane and can plot points and place polygons in the coordinate plane to solve real-world and math problems. They can classify two-dimensional shapes and use formulas to determine the area of two-dimensional shapes such as triangles. They can determine the surface area of three-dimensional shapes composed of rectangles and triangles, and find the volume of right rectangular prisms. They are able to convert like measurement units within a given measurement system and use these conversions to solve multi-step, real-world problems. They are also able to solve measurement word problems that involve simple fractions or decimals.</p> <p>Data Analysis and Statistics: Students prepared to exit this level have a basic conceptual understanding of statistical variability, including such concepts as center, spread, and the overall shape of a distribution of data. They can present data using displays such as dot plots, histograms, and box plots.</p>

ABE Level 4

Assessment Ranges	
CASAS scale scores: • Reading GOALS: 228–238	CASAS scale scores: • Math GOALS: 215–225
Basic Reading and Writing	Numeracy Skills
<p>Reading: Individuals who are ready to exit the High Intermediate Level are able to read fluently text of the complexity demanded of this level (e.g., a Lexile Measure of between 925 and 1185) They display increasing facility with academic vocabulary and are able to analyze the impact of a specific word choice on meaning and tone in level-appropriate complex texts.</p> <p>Individuals are able to make logical inferences by offering several pieces of textual evidence. This includes citing evidence to support the analysis of primary and secondary sources in history, as well as analysis of science and technical texts. They are able to summarize and analyze central ideas, including how they are conveyed through particular details in the text. They also are able to analyze how a text makes connections among and distinctions between ideas or events and how major sections of a text contribute to the development of the ideas. They also are able to follow multistep procedures. Individuals are able to identify aspects of a text that reveal point of view and assess how point of view shapes style and content in texts. In addition, they are able to evaluate the validity of specific claims an author makes through the sufficiency of the reasoning and evidence supplied in the text. This includes analyzing how an author responds to conflicting evidence or viewpoints. They are able to analyze how multiple texts address similar themes, including how authors acknowledge and respond to conflicting evidence or viewpoints and include or avoid particular facts. Individuals are also able to analyze the purpose of information presented in diverse media as well as integrate and evaluate content from those sources, including quantitative or technical information presented visually and in words. They are able to produce valid evidence for their findings and assertions, make sound decisions, and solve problems.</p> <p>Writing: Writing in response to one or more text(s), individuals ready to exit this level are able to compose arguments and informative texts (this includes the narration of historical events, scientific procedures/experiments, or technical processes). When writing arguments, they are able to introduce claims, acknowledge alternate or opposing claims, support claims with clear reasons and relevant evidence, and organize them logically in a manner that demonstrates an understanding of the topic. When writing informative texts, individuals are able to examine a topic through the selection, organization, and analysis of relevant facts, concrete details, quotations and other information to aid comprehension. Individuals create cohesion in their writing by clarifying the relationships among ideas, reasons, and evidence; using appropriate transitions; and including a logical progression of ideas, and maintaining consistency in style and tone. Individuals are able to use specific word choices appropriate for the topic, purpose, and audience. They also are able to use technology to produce and publish writing and link to and cite sources. They conduct short research projects, drawing on several sources. This includes the ability to draw evidence from several texts to support an analysis. It also includes the ability to locate and organize information, assess the credibility and accuracy of each source, and communicate the data and conclusions of others while avoiding plagiarism.</p>	<p>The Mathematical Practices: Students prepared to exit this level are able to think critically, determine an efficient strategy (from among multiple possible strategies) for solving a multi-step problem, and persevere in solving challenging problems. They can express themselves using the mathematical terms and notation appropriate to the level. They are able to defend their findings and critique the reasoning of others. They are accurate in their calculations and use estimation strategies to assess the reasonableness of their results. They can create algebraic and geometric models and use them to answer questions and solve problems. They can strategically select and use tools to aid in their work, such as pencil/paper, measuring devices, calculators, and/or spreadsheets. They are able to see patterns and structure in number sets, data, expressions and equations, and geometric figures.</p> <p>Number Sense and Operations: Students prepared to exit this level have an understanding of the rational number system, including how rational numbers can be represented on a number line and pairs of rational numbers can be represented on a coordinate plane. They can apply the concept of absolute value to find horizontal and vertical distances. They are able to apply the properties of integer exponents and evaluate, estimate, and compare simple square roots and cube roots. Individuals at this level also understand ratio, rate, and percent concepts, as well as proportional relationships.</p> <p>Algebraic Thinking: Students prepared to exit this level understand the connections between proportional relationships, lines, and linear equations. They understand numerical and algebraic expressions, and equations and are able to use them to solve real-world and mathematical problems. They are able to analyze and solve linear equations and pairs of simultaneous linear equations. Individuals at this level are able to define, interpret, and compare linear functions.</p> <p>Geometry: Students prepared to exit this level can solve real-world and mathematical problems that involve angle measure, circumference, and area of 2-dimensional figures. They are able to solve problems involving scale drawings of 2-dimensional geometric figures. They understand the concepts of congruence and similarity with respect to 2-dimensional figures. They understand the Pythagorean theorem and can apply it to determine missing lengths in right triangles.</p> <p>Statistics and Probability: Students prepared to exit this level can summarize and describe numerical data sets in relation to their context, including determining measures of center and variability and describing patterns and/or striking deviations from patterns. They understand and can apply the concept of chance, or probability. They are able to use scatter plots for bivariate measurement data to describe patterns of association between two quantities (such as clustering, outliers, positive or negative association, linear or non-linear association).</p>

Assessment Ranges	
<p>CASAS scale scores:</p> <ul style="list-style-type: none"> • Reading GOALS: 239–248 	<p>CASAS scale scores:</p> <ul style="list-style-type: none"> • Math GOALS: 226–235
Basic Reading and Writing	Numeracy Skills
<p>Reading: Individuals who are ready to exit Low Adult Secondary Level are able to read fluently texts that measure at the secondary level of complexity. This includes increasing facility with academic vocabulary and figurative language in level-appropriate complex texts. This includes determining the meaning of symbols and key terms used in a specific scientific or technical context. They are able to analyze the cumulative impact of specific word choices on meaning and tone. Individuals are able to make logical and well supported inferences about those complex texts. They are able to analyze the development of central ideas over the course of a text and explain how they are refined by particular sentences, paragraphs, or portions of text. They are able to provide an objective summary of a text. They are able to analyze in detail a series of events described in text and determine whether earlier events caused later ones or simply preceded them. They also are able to follow complex multistep directions or procedures. Individuals are able to compare the point of view of two or more authors writing about the same or similar topics. They are able to evaluate the validity of specific claims an author makes through the sufficiency and relevance of the reasoning and evidence supplied. They also are able to identify false statements and fallacious reasoning. They are able to analyze how multiple texts address related themes and concepts, including challenging texts, such as seminal U.S. documents of historical and literary significance. In addition, they are able to contrast the findings presented in a text, noting whether those findings support or contradict previous explanations or accounts. Individuals are also able to translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically into words. Through their reading and research, they are able to cite strong and thorough textual evidence for their findings and assertions to make informed decisions and solve problems.</p> <p>Writing: Individuals ready to exit this level are able to compose arguments and informative texts. When writing arguments, they are able to introduce precise claims, distinguish the claims from alternate or opposing claims, and support claims with clear reasons and relevant and sufficient evidence. When writing informative texts, they are able to examine a topic through the effective selection, organization, and analysis of well-chosen, relevant, and sufficient facts appropriate to the audience’s knowledge of the topic. They use appropriate and varied transitions as well as consistency in style and tone to link major sections of the text, create cohesion, and establish clear relationships among claims, reasons, and evidence. Individuals use precise language and domain-specific vocabulary to manage the complexity of the topic. They are also able to take advantage of technology’s capacity to link to other information and display information flexibly and dynamically. They conduct short research projects as well as more sustained research projects to make informed decisions and solve problems. This includes the ability to draw evidence from several texts to support an analysis. It also includes the ability to gather and organize information, assess the credibility, accuracy, and usefulness of each source, and communicate the data and conclusions of others while avoiding plagiarism.</p>	<p>The Mathematical Practices: Students prepared to exit this level are able to think critically, determine an efficient strategy (from among multiple possible strategies) for solving a multi-step problem, and persevere in solving challenging problems. They can reason quantitatively, including using units as a way to solve problems. They are able to defend their findings and critique the reasoning of others. They are accurate in their calculations and use estimation strategies to assess the reasonableness of their results. They can create algebraic and geometric models and use them to answer questions and solve problems. They can strategically select and use tools to aid in their work, such as graphing calculators, spreadsheets, and/or computer software. They are able to make generalizations based on patterns and structure they discover in number sets, data, expressions and equations, and geometric figures and use these insights to work more efficiently.</p> <p>Number Sense and Operations: Students prepared to exit this level can reason about and solve real-world and mathematical problems that involve the four operations with rational numbers. They can apply the concept of absolute value to demonstrate on a number line their understanding of addition and subtraction with negative and positive rational numbers. Individuals at this level can apply ratio and percent concepts, including using rates and proportional relationships to solve multistep real-world and mathematical problems.</p> <p>Algebraic Thinking: Students prepared to exit this level are able to use algebraic and graphical representations to solve real-world and mathematical problems, involving linear equations, inequalities, and pairs of simultaneous linear equations. Individuals at this level are able to use linear functions to describe, analyze, and model linear relationships between quantities.</p> <p>Geometry: Students prepared to exit this level can solve real world and mathematical problems that involve volume and surface area of 3-dimensional geometric figures. They can use informal arguments to establish facts about various angle relationships such as the relationships between angles created when parallel lines are cut by a transversal. They apply the Pythagorean theorem to determine lengths in real-world contexts and distances in the coordinate plane.</p> <p>Statistics and Probability: Students prepared to exit this level can use random sampling to draw inferences about a population and are able to draw informal comparative inferences about two populations using measures of center and measures of variability for numerical data from random samples. They can develop, use, and evaluate probability models. They are able to use scatter plots for bivariate measurement data to interpret patterns of association between two quantities (such as clustering, outliers, positive or negative association, linear or non-linear association) and a 2-way table to summarize and interpret bivariate categorical data.</p>

Assessment Ranges	
<p>CASAS scale scores:</p> <ul style="list-style-type: none"> • Reading GOALS: 249 and above 	<p>CASAS scale scores:</p> <ul style="list-style-type: none"> • Math GOALS: 236 and above
Basic Reading and Writing	Numeracy Skills
<p>Reading: Individuals who are ready to exit High Adult Secondary Level are able to read fluently at the college and career readiness level of text complexity (e.g., a Lexile Measure between 1185 and 1385). This includes increasing facility with academic vocabulary and figurative language sufficient for reading, writing, speaking, and listening at the college and career readiness level. They are able to analyze the cumulative impact of specific word choices on meaning and tone. Individuals are able to make logical and well-supported inferences about those complex texts. They are able to summarize the challenging ideas, concepts or processes contained within them. They are able to paraphrase texts in simpler but still accurate terms. Whether they are conducting analyses of complex primary and secondary sources in history or in scientific and technical texts, they are able to analyze how the ideas and concepts within them develop and interact. Individuals are able to assess how points of view shape style and content in texts with particular attention to distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement). Individuals are able to analyze how multiple texts address related themes and concepts, including challenging texts such as U.S. founding documents (Declaration of Independence, the Bill of Rights). In addition, they are able to compare and contrast treatments of the same topic in several primary and secondary sources. Individuals are also able to integrate and evaluate multiple sources of information presented in diverse media in order to address a question. Through their reading and research at complex levels, they are able to cite strong and thorough textual evidence for their findings and assertions to make sound decisions and solve problems.</p> <p>Writing: Writing in response to one or more text(s), individuals ready to exit this level are able to compose arguments and informative texts (this includes the narration of historical events, scientific procedures/ experiments, or technical processes). When writing arguments, they are able to create an organization that establishes clear relationships among the claim(s), counterclaim(s), reasons and evidence. They fully develop claims and counterclaims, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience’s knowledge level and concerns. When writing informative texts, they are able to organize complex ideas, concepts, and information to make important connections and distinctions through the effective selection and analysis of content. They use appropriate and varied transitions to clarify the relationships among complex ideas, create cohesion, and link major sections of the text. Individuals are able to maintain a formal style while they attend to the norms and conventions of the discipline in which they are writing. They are also able to take advantage of technology’s capacity to link to other information and display information flexibly and dynamically. They conduct short research projects as well as more sustained research projects that require the synthesis of multiple complex sources to make informed decisions and solve problems. This includes the ability to draw evidence from several texts to support an analysis. It also includes the ability to gather and organize information, assess the credibility, accuracy, and usefulness of each source in answering the research question, noting any discrepancies among the data collected.</p>	<p>The Mathematical Practices: Students prepared to exit this level are able to think critically, make assumptions based on a situation, select an efficient strategy from multiple possible problem-solving strategies, plan a solution pathway, and make adjustments as needed when solving problems. They persevere in solving challenging problems, including considering analogous, simpler problems as a way to solving a more complex one. They can reason quantitatively, including through the use of units, and can express themselves using the precise definitions and mathematical terms and notation appropriate to the level. They are accurate in their calculations, use an appropriate level of precision in finding solutions and reporting results, and use estimation strategies to assess the reasonableness of their results. They are able to make conjectures, use logic to defend their conclusions, and can detect faulty thinking and errors caused by improper use of technology. They can create algebraic and geometric models and use them to answer questions, interpret data, make predictions, and solve problems. They can strategically select and use tools, such as measuring devices, calculators, spreadsheets, and/or computer software, to aid in their work. They are able to see patterns and structure in calculations, expressions, and equations and make connections to algebraic generalizations, which they use to work more efficiently.</p> <p>Number Sense and Operations: Students prepared to exit this level have extended their number sense to include irrational numbers, radicals, and rational exponents and understand and use the set of real numbers. They are able to assess the reasonableness of calculation results based on the limitations of technology or given units and quantities and give results with the appropriate degree of precision.</p> <p>Algebraic Thinking: Students prepared to exit this level understand the structure of expressions and can use that structure to rewrite linear, exponential, and quadratic expressions. They can add, subtract, and multiply polynomials that involve linear and/or quadratic expressions. They are also able to create linear equations and inequalities and quadratic and simple exponential equations to represent relationships between quantities and can represent constraints by linear equations or inequalities, or by systems of linear equations and/or inequalities. They can interpret the structure of polynomial and rational expressions and use that structure to identify ways to rewrite and operate accurately with them. They can add, subtract, and multiply polynomials that extend beyond quadratics. They are able to rearrange formulas to highlight a quantity of interest, for example rearranging Ohm’s law, $V = IR$, to highlight resistance R. They are also able to create equations and inequalities representing relationships between quantities, including those that extend beyond equations or inequalities arising from linear, quadratic, and simple exponential functions to include those arising from simple rational functions. They are able to use these equations/inequalities to solve problems both algebraically and graphically. They can solve linear equations and inequalities; systems of linear equations; quadratic, simple rational, and radical equations in one variable, and recognize how and when extraneous solutions may arise.</p> <p>Students prepared to exit this level also have a basic understanding of functions, can use function notation properly, and use such notation to write a function describing a relationship between two quantities. They are able to evaluate functions for inputs in their domains and interpret linear,</p>

quadratic, and exponential functions that arise in applications in terms of the context. They are able to construct, graph, compare, and interpret functions (including, but not limited to, linear, quadratic, and exponential). They can sketch graphs given a verbal description of the relationship and identify and interpret key features of the graphs of functions that arise in applications in a context. They are able to select or define a function that appropriately models a relationship and to compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal description).

Geometry: Students prepared to exit this level can solve problems involving similarity and congruence criteria for triangles and use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. They can apply the concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTU's per cubic foot).

Data Analysis and Statistics: Students prepared to exit this level can summarize, represent, and interpret data based on two categorical and quantitative variables, including by using frequency tables. They can compare data sets by looking at commonalities and differences in shape, center, and spread. They can recognize possible associations and trends in data, in particular in linear models, and distinguish between correlation and causation. They interpret one- and two-variable data, including those with linear and non-linear relationships. They interpret the slope (rate of change) and intercept (constant term) for a line of best fit and in the context of the data. They understand and account for extreme points of data in their analysis and interpret relative frequencies (joint, marginal and conditional).

<https://nrsweb.org/sites/default/files/NRS-TA-Aug2019-508.pdf>