Indiana Department of Education

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**Indiana Academic Standards 2020
Algebra II
Standards Correlation Guidance Document**

Intentional alignment of instructional practices and curricular materials to the Indiana Academics Standards (IAS) is vital to improving student outcomes. This guide is meant to encourage strong standards-based instruction when utilizing curricular materials not aligned to IAS but to Common Core State Standards (CCSS). Purchased curricula are not designed to perfectly align with IAS and often align with CCSS. Use of this guide will ensure strong alignment to IAS and foster critical conversations around instructional decisions.

Considerations for use:

- Identify the desired IAS;
- Unpack the IAS, referencing the IDOE Math Framework;
- Determine the correlating CCSS;
- Consider the differences between IAS and learning objective from CCSS aligned curricular material;
- Identify instructional gaps (in content or complexity) and consider strategies to supplement; and
- Prioritize content in curricular material that is identified in the IAS.

IDOE's Math Framework provides student success criteria, vertical planning, digital resources, and clarifying examples to consider when planning, implementing, and teaching IAS.

Indiana Academic Standards (IAS) 2020	Common Core State Standards (CCSS)	Difference Between IAS 2020 and CCSS
Process Standards for Mathematics		
PS.1: Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway, rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" and "Is my answer reasonable?" They understand the approaches of others to solving complex problems and identify correspondences between different approaches. Mathematically proficient students understand how mathematical	**MP1: Make sense of problems and persevere in solving them.** Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to	IAS removes criteria involving a graphing calculator and does not distinguish between younger and older students.

ideas interconnect and build on one another to produce a coherent whole.	help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.	
PS.2: Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	**MP.2: Reason abstractly and quantitatively.** Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	*No content differences identified.*

PS.3: Construct viable arguments and critique the reasoning of others.	MP.3: Construct viable arguments and critique the reasoning of others.	IAS includes the justification of statements that are true always, sometimes, or never. IAS includes collaboration in a mathematics community and does not distinguish between younger and older students.
Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They analyze situations by breaking them into cases and recognize and use counterexamples. They organize their mathematical thinking, justify their conclusions and communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. They justify whether a given statement is true always, sometimes, or never. Mathematically proficient students participate and collaborate in a mathematics community. They listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.	Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense,	

	and ask useful questions to clarify or improve the arguments.	
PS.4: Model with mathematics. Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	**MP.4: Model with mathematics.** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	IAS does not distinguish between younger and older students.

PS.5: Use appropriate tools strategically.	MP.5: Use appropriate tools strategically.	IAS does not distinguish between younger and older students.
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Mathematically proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students identify relevant external mathematical resources, such as digital content, and use them to pose or solve problems. They use technological tools to explore and deepen their understanding of concepts and to support the development of learning mathematics. They use technology to contribute to concept development, simulation, representation, reasoning, communication and problem solving.	Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.	

PS.6: Attend to precision.	MP.6: Attend to precision.	IAS does not distinguish between younger and older students.
Mathematically proficient students communicate precisely to others. They use clear definitions, including precision. correct mathematical language, in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They express solutions clearly and logically by using the appropriate mathematical terms and notation. They specify units of measure and label axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and check the validity of their results in the context of the problem. They express numerical answers with a degree of precision appropriate for the problem context.	Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	
PS.7: Look for and make use of structure.	MP.7: Look for and make use of structure.	IAS has removed examples and does not distinguish between younger and older students.
Mathematically proficient students look closely to discern a pattern or structure. They step back for an overview and shift perspective. They recognize and use properties of operations and equality. They organize and classify geometric shapes based on their attributes. They see expressions, equations, and geometric figures as single objects or as being composed of several objects.	Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$.	

	They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	
PS.8: Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated and look for general methods and shortcuts. They notice regularity in mathematical problems and their work to create a rule or formula.Mathematically proficient students maintain oversight of the process, while attending to the details as they solve a problem. They continually evaluate the reasonableness of their intermediate results.	**MP.8: Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students	IAS has removed examples and does not distinguish between younger and older students.

	maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.	

Indiana Academic Standards (IAS) 2020	Common Core State Standards (CCSS)	Difference Between IAS 2020 and CCSS
Data Analysis, Statistics, and Probability		
AII.DSP.1: Distinguish between random and non-random sampling methods, identify possible sources of bias in sampling, describe how such bias can be controlled and reduced, evaluate the characteristics of a good survey and well-designed experiment, design simple experiments or investigations to collect data to answer questions of interest, and make inferences from sample results.	**7.SPA.1:** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	IAS requires understanding of random and non-random sampling methods, identification of sources of bias in sampling, how to control and reduce bias; requires critique of survey and experiment design; requires students to design simple experiments or investigations, collect data, and make inferences.
AII.DSP.2: Interpret and compare univariate data using measures of center (mean and median) and spread (range, inter-quartile range, standard deviation, and variance). Understand the effects of outliers on the statistical summary of the data.	**HSS.ID.A.2:** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. **HSS.ID.A.3:** Interpret differences in shape, center and spread in the context of data sets, accounting for possible effects of extreme data points (outliers).	IAS includes variance as a measure of spread; includes the understanding of the effects of outliers.
AII.DSP.3: Use technology to find a linear, quadratic, or exponential function that models a relationship for a bivariate data set to make predictions; Interpret the correlation coefficient for linear models.	**HSS.ID.B.6.A:** Fit a function to the data; use functions fitted to data to solve problems in the context of data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	IAS emphasizes the use of technology.

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	HSS.ID.C.8: Compute (using technology) and interpret the correlation coefficient of a linear fit.	
AII.DSP.4: Using the results of a simulation, decide if a specified model is consistent to those results. Construct a theoretical model and apply the law of large numbers to show the relationship between the two models.	**HSS.IC.A.2:** Decide if a specified model is consistent with results from a given data-generating process.	IAS requires students to construct theoretical models; requires students to apply the law of large numbers to compare theoretical and specified models
AII.DSP.5: Understand dependent and independent events, and conditional probability; apply these concepts to calculate probabilities.	**HSS.CP.A.2:** Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. **HSS.CP.A.3:** Understand the conditional probability of A given B as P(A andB)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. **HSS.CP.A.5:** Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.	IAS extends to the calculation of probabilities.
AII.DSP.6: Understand the Fundamental Counting Principle, permutations, and	**HSS.CP.B.9:** Use permutations and combinations to compute probabilities of compound events and solve problems.	IAS includes the Fundamental Counting Principle.

combinations; apply these concepts to calculate probabilities.		

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Arithmetic and Structure of Expressions		
AII.ASE.1: Explain how extending the properties of integer exponents to rational numbers allows for a notation for radicals in terms of rational exponents (e.g. $5^{1/3}$ is defined to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.)	**HSN.RN.A.1:** Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.	*No content differences identified.*
AII.ASE.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**HSN.RN.A.2:** Rewrite expressions involving radicals and rational exponents using the properties of exponents.	*No content differences identified.*
AII.ASE.3: Rewrite algebraic rational expressions in equivalent forms (e.g., using properties of exponents and factoring techniques). Add, subtract, multiply, and divide algebraic rational expressions.	**8.EE.A.1:** Know and apply the properties of integer exponents to generate equivalent numerical expressions. **HSA.SSE.A.2:** Use the structure of an expression to identify ways to rewrite it. **HSA.APR.D.7:** Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	IAS requires algebraic expressions; does not require an understanding of closure.
AII.ASE.4: Rewrite rational expressions in different forms; write a(x)/b(x) in the form	**HSA.APR.D.6:** Rewrite simple rational expressions in different forms; write	IAS does not explicitly list methods.

| q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x). | a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system. | |

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Functions		
AII.F.1: Understand composition of functions and combine functions by composition.	**HSF.BF.A.1.C:** Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.	*No content differences identified.*
AII.F.2: Define and find the inverse of a function. Verify functions are inverses algebraically and graphically.	**HSF.BF.B.4:** Find inverse functions. **HSF.BF.B.4.A:** Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x^3 or f(x) = (x+1)/(x–1) for x ≠ 1. **HSF.BF.B.4.B:** Verify by composition that one function is the inverse of another.	IAS additionally requires students to verify functions are inverses graphically.
AII.F.3: Understand that if the graph of a function contains a point (a, b), then the graph of the inverse relation of the function contains the point (b, a); the inverse is a reflection over the line y = x.	**HSF.BF.B.4.C:** Read values of an inverse function from a graph or a table, given that the function has an inverse.	IAS specifically cites students should understand that inverses are reflections over the line y = x.
AII.F.4: Explore and describe the effect on the graph of f(x) by replacing f(x) with f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative) with and	**HSF.BF.B.3:** Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the	IAS excludes the recognition of even and odd functions.

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without technology. Find the value of k given the graph of f(x) and the graph of f(x) + k, k f(x), f(kx), or f(x + k).	graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	

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Systems of Equations and Inequalities		
AII.SEI.1: Solve a system of equations consisting of a linear equation and a quadratic equation in two variables algebraically and graphically with and without technology.	**HSA.REI.C.7:** Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.	*No content differences identified.*
AII.SEI.2: Represent and solve real-world systems of linear equations and inequalities in two or three variables algebraically and using technology. Interpret the solution set and determine whether it is reasonable.	**HSA.REI.C.6:** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. **HSA.REI.D.12:** Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. **HSA.CED.A.3:** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.	IAS includes equations and inequalities in three variables
AII.SEI.3: Represent real-world problems using a system of linear equations in three variables. Understand that the algebraic	**HSA.CED.A.3:** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret	IAS extends to systems in three variables.

steps to solve a two variable system can be extended to systems of equations in three variables.	solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	

Indiana Academic Standards (IAS) 2020	Common Core State Standards (CCSS)	Difference Between IAS 2020 and CCSS
Quadratic Equations and Functions		
AII.Q.1: Represent real-world problems that can be modeled with quadratic functions using tables, graphs, and equations; translate fluently among these representations. Solve such problems with and without technology. Interpret the solutions and determine whether they are reasonable.	**HSF.IF.C.7.A:** Graph linear and quadratic functions and show intercepts, maxima, and minima. **HSA.REI.B.4.B:** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	IAS requires students to represent real-world problems; requires students to be able to translate between representations fluently;requires students to interpret solutions and determine their reasonableness.
AII.Q.2: Use completing the square to rewrite quadratic functions in vertex form and graph these functions with and without technology.	**HSA.REI.B.4.A:** Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this.	IAS requires students to graph functions written in vertex form; does not require students to derive the quadratic formula.
AII.Q.3: Understand that different forms of a quadratic equation can provide different information. Use and translate quadratic functions between standard, vertex, and intercept form to graph and identify key features, including intercepts, vertex, line of symmetry, end behavior, and domain and range.	**HSA.SSE.3.b:** Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. **HSA.SSE.B.3:** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	IAS is limited to quadratic functions

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	HSF.IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **HSF.FI.B.4:** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	
AII.Q.4: Use the discriminant to determine the number and type of solutions of a quadratic equation. Find all solutions and write complex solutions in the form of a ± bi for real numbers a and b.	**HSN.CN.C.7:** Solve quadratic equations with real coefficients that have complex solutions.	IAS requires students to utilize the discriminant to determine number and type of solutions.

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Exponential and Logarithmic Equations and Functions		
AII.EL.1: Graph exponential and logarithmic functions with and without technology. Identify and describe key features, such as intercepts, domain and range, asymptotes and end behavior. Know that the inverse of an exponential function is a logarithmic function.	**HSF.IF.C.7:** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **HSF.IF.C.7.E:** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. **HSF.FI.B.4:** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. **HSF.BF.B.5:** Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	IAS does not require students to use the inverse relationship to solve problems.

AII.EL.2: Identify the percent rate of change in exponential functions. Classify them as representing exponential growth or decay.	**HSF.IF.C.8.B:** Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.	*No content differences identified.*
AII.EL.3: Use the properties of exponents to rewrite expressions to describe transformations of exponential functions.	**HSF.IF.C.8.B:** Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay. **HSF.BF.B.3:** Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	IAS omits identifying exponential functions as increasing or decreasing; omits classifying as growth or decay; omits recognition of even and odd functions.
AII.EL.4: Use the properties of exponents to derive the properties of logarithms. Evaluate exponential and logarithmic expressions.	**HSF.BF.B.5:** Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	IAS does not require students to solve problems involving logarithms and exponents.

AII.EL.5: Solve exponential and logarithmic equations in one variable.	**HSF.BF.B.5:** Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	IAS is limited to solving exponential and logarithmic equations in one variable.
AII.EL.6: Represent real-world problems using exponential and logarithmic functions and solve such problems with technology. Interpret the solutions and determine whether they are reasonable.	*No CCSS equivalent.*	

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Polynomial, Rational, and Other Equations and Functions		
AII.PR.1: Solve real-world and other mathematical problems involving polynomial equations with and without technology. Interpret the solutions and determine whether the solutions are reasonable.	*No CCSS equivalent.*	
AII.PR.2: Graph mathematical functions including: a. polynomial functions; b. rational functions; c. square root functions; d. absolute value functions; and, e. piecewise-defined functions with technology. Identify and describe features, such as intercepts, domain and range, end behavior, and lines of symmetry.	**HSF.IF.C.7:** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **HSF.IF.C.7.B:** Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. **HSF.IF.C.7.C:** Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. **HSF.IF.C.7.D:** Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	IAS does not specify cube root functions.
AII.PR.3: Solve real-world and other mathematical problems involving radical and rational equations. Give examples showing how extraneous solutions may arise.	**A.REI.2:** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	IAS explicitly states real-world problems.

AII.PR.4: Solve absolute value linear equations and inequalities in one variable.	**HSA.CED.A.1:** Create equations and inequalities in one variable and use them to solve problems.	IAS is specific to absolute value.