STATE OF SOUTH CAROLINA

DEPARTMENT OF EDUCATION

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STATE SUPERINTENDENT OF EDUCATION

Intermediate Algebra Correlation to the *2025 South Carolina College- and Career- Ready Mathematics Standards*

Office of Assessment and Standards

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Document Overview

This document is intended to show the correlation between the 2015 Intermediate Algebra standards with the 2025 Algebra 1 and Algebra 2 with Probability indicators to address what should be included in the 2025 Intermediate Algebra course.

This correlation aligns the new Intermediate Algebra course with the Algebra 1 EOCEP indicators that will be assessed. Note that any 2015 Intermediate Algebra standards that are not aligned to the 2025 Algebra 1 Standards will not be assessed on the Algebra 1 EOCEP. Page 10 includes the 2025 Algebra 1 indicators that do not crosswalk to either Foundations in Algebra or Intermediate Algebra standards.

Intermediate Algebra Crosswalk

Arithmetic with Polynomials and Rational Expressions

2015 Standard	*Correlating 2025 Indicator*
IA.AAPR.1* Add, subtract, and multiply polynomials and understand that polynomials are closed under these operations.	**A1.PAFR.1.4** Add, subtract, and multiply polynomials with initial terms up to a degree of 2.

Creating Equations

2015 Standard	*Correlating 2025 Indicator*
IA.ACE.1* Create and solve equations and inequalities in one variable that model real-world problems involving linear, quadratic, simple rational, and exponential relationships. Interpret the solutions and determine whether they are reasonable.	**A1.PAFR.1.1** Transform an equation in one variable to create new equations that have the same solution as the original and justify the steps taken. **A1.PAFR.1.3** Solve mathematical and real-world situations using linear, quadratic, exponential (same bases), and linear absolute value equations in one variable.
IA.ACE.2* Create equations in two or more variables to represent relationships between quantities. Graph the equations on coordinate axes using appropriate labels, units, and scales.	**A1.PAFR.2.4** Create, solve, and graph linear inequalities in two variables.
IA.ACE.4* Solve literal equations and formulas for a specified variable including equations and formulas that arise in a variety of disciplines.	**A1.PAFR.1.2** Solve literal equations and formulas for a specified variable including equations and formulas that arise in a variety of disciplines.

Reasoning with Equations and Inequalities

2015 Standard	*Correlating 2025 Indicator*
IA.AREI.2* Solve simple rational and radical equations in one variable and understand how extraneous solutions may arise.	**A2P.PAFR.2.3** Create and solve rational and radical equations in one variable, including those that model real-life situations, and verify solutions to identify extraneous solutions if they appear.

2015 Standard	*Correlating 2025 Indicator*
IA.AREI.4* Solve mathematical and real-world problems involving quadratic equations in one variable. (Note: IA.AREI.4a and 4b are not Graduation Standards.) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-h)^2=k$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection, 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 $a+bi$ for real numbers a and b.	**A1.PAFR.1.1** Transform an equation in one variable to create new equations that have the same solution as the original and justify the steps taken. **A1.PAFR.1.3** Solve mathematical and real-world situations using linear, quadratic, exponential (same bases), and linear absolute value equations in one variable. **A1.PAFR.2.2** Solve quadratic equations by completing the square, factoring, and the quadratic formula, explaining the connection between the zeros of the function derived from the equation, its linear factors (if it factors), the x-intercepts of its graph (if they exist), and the solutions (if any) to the corresponding quadratic equation.
IA.AREI.11* Solve an equation of the form $f(x)=g(x)$ graphically by identifying the x-coordinate(s) of the point(s) of intersection of the graphs of $y=f(x)$ and $y=g(x)$.	**A1.PAFR.2.8** Solve an equation of the form $f(x) = g(x)$ graphically by identifying the x-coordinate(s) of the point(s) of intersection of the graphs of $y = f(x)$ and $y = g(x)$.

Structure and Expressions

2015 Standard	*Correlating 2025 Indicator*
IA.ASE.1* Interpret the meanings of coefficients, factors, terms, and expressions based on their real-world contexts. Interpret complicated expressions as being composed of simpler expressions.	**No A1 or A2P correlating indicator.**

2015 Standard	*Correlating 2025 Indicator*
IA.ASE.2* Analyze the structure of binomials, trinomials, and other polynomials in order to rewrite equivalent expressions.	**A1.PAFR.2.1** Transform linear, quadratic, exponential, and linear absolute value functions to equivalent forms to identify slope and *y*-intercept for linear, vertex, and roots (if any) for quadratic and linear absolute value, and *y*-intercept for exponential. **A2P.PAFR.1.3** Graph and analyze polynomial functions in mathematical and real-world situations. **A1.PAFR.3.3** Translate among graphical, tabular, verbal, and symbolic representations in function notation, to identify intercepts, intervals where the function is increasing, decreasing, constant, maximums and minimums, and symmetries and explain their meanings in real-world and mathematical situations.
IA.ASE.3* Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (Note: IA.ASE.3b is not a Graduation Standard.) a. Find the zeros of a quadratic function by rewriting it in equivalent factored form and explain the connection between the zeros of the function, its linear factors, the x-intercepts of its graph, and the solutions to the corresponding quadratic equation. b. Determine the maximum or minimum value of a quadratic function by completing the square.	**A2P.PAFR.1.3** Graph and analyze polynomial functions in mathematical and real-world situations. **A1.PAFR.2.1** Transform linear, quadratic, exponential, and linear absolute value functions to equivalent forms to identify slope and *y*-intercept for linear, vertex, and roots (if any) for quadratic and linear absolute value, and *y*-intercept for exponential. **A1.PAFR.2.2** Solve quadratic equations by completing the square, factoring, and the quadratic formula, explaining the connection between the zeros of the function derived from the equation, its linear factors (if it factors), the *x*-intercepts of its graph (if they exist), and the solutions (if any) to the corresponding quadratic equation.

Building Functions

2015 Standard	*Correlating 2025 Indicator*
IA.FBF.1* Write a function that describes a relationship between two quantities. (Note: IA.FBF.1a is not a Graduation Standard.) a. Write a function that models a relationship between two quantities using both explicit expressions and a recursive process and by combining standard forms using addition, subtraction, multiplication and division to build new functions. b. Combine functions using the operations addition, subtraction, multiplication, and division to build new functions that describe the relationship between two quantities in mathematical and real-world situations.	**A1.PAFR.2.6** Create symbolic representations of linear and exponential functions, including arithmetic and geometric sequences, given graphs, verbal descriptions, and tables.
IA.FBF.2* Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	**A1.PAFR.2.5** Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
IA.FBF.3* Describe the effect of the transformations $kf(x)$, $f(x)+k$, $f(x+k)$, and combinations of such transformations on the graph of $y=f(x)$ for any real number k. Find the value of k given the graphs and write the equation of a transformed parent function given its graph.	**A1.PAFR.4.1** Describe the effect of the transformations $kf(x)$, $f(x)+k$, $f(x+k)$, $f(x) - k$, $f(x -k)$, and combinations of such transformations on the graph of parent function $y = f(x)$ for any real number k; find the value of k given the graphs; and write the equation of a transformed parent function given its graph. **A1.PAFR.4.2** Given a real-world or mathematical situation, determine the parent graph that best models the situation.

Interpreting Functions

2015 Standard	*Correlating 2025 Indicator*
IA.FIF.3* Define functions recursively and recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	**A1.PAFR.2.6** Create symbolic representations of linear and exponential functions, including arithmetic and geometric sequences, given graphs, verbal descriptions, and tables. **A1.PAFR.3.1** Recognize that *f(x)* denotes the output of function f that corresponds to the set of all the ordered pairs *(x,y)* that satisfy the equation *y=f(x)* both tabularly and graphically. **A1.PAFR.3.2** Use the definition to analyze the domain and range of a function in relation to its graph, mapping, table, verbal, and/or symbolic description and, where applicable, using interval and set notation.
IA.FIF.4* Interpret key features of a function that models the relationship between two quantities when given in graphical or tabular form. Sketch the graph of a function from a verbal description showing key features. Key features include intercepts; intervals where the function is increasing, decreasing, constant, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity.	**A1.PAFR.3.3** Translate among graphical, tabular, verbal, and symbolic representations in function notation, to identify intercepts, intervals where the function is increasing, decreasing, constant, maximums and minimums, and symmetries and explain their meanings in real-world and mathematical situations. **A1.PAFR.4.3** Given different representations of two different functions, compare key features including intercepts, domain and range, intervals of increasing and decreasing, constant, average rate of change, and maximum and minimum values.
IA.FIF.5* Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.	**A1.PAFR.3.1** Recognize that *f(x)* denotes the output of function f that corresponds to the set of all the ordered pairs *(x,y)* that satisfy the equation *y=f(x)* both tabularly and graphically. **A1.PAFR.3.2** Use the definition of a function to analyze the domain and range of a function in relation to its graph, mapping, table, verbal, and/or symbolic description and, where applicable, using interval and set notation.

2015 Standard	*Correlating 2025 Indicator*
IA.FIF.6* Given a function in graphical, symbolic, or tabular form, determine the average rate of change of the function over a specified interval. Interpret the meaning of the average rate of change in a given context.	**A1.PAFR.4.3** Given different representations of two different functions, compare key features including intercepts, domain and range, intervals of increasing and decreasing, constant, average rate of change, and maximum and minimum values. **A2P.PAFR.6.2** Calculate and interpret the average rate of change of the function over a specified interval, given a function in graphical, symbolic, or numerical form.
IA.FIF.7* Graph functions from their symbolic representations. Indicate key features including intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity. Graph simple cases by hand and use technology for complicated cases.	**A1.PAFR.2.1** Transform linear, quadratic, exponential, and linear absolute value functions to equivalent forms to identify slope and *y*-intercept for linear, vertex, and roots (if any) for quadratic and linear absolute value, and *y*-intercept for exponential. **A1.PAFR.2.3** Solve and graph linear, quadratic, exponential, and linear absolute value equations given in tabular, symbolic, and/or verbal forms using intercepts, domain and range, intervals of increasing and decreasing, vertex (maximum and minimum), end-behavior, and symmetry, and interpret these in terms of mathematical and real-world situations.
IA.FIF.8* Translate between different but equivalent forms of a function equation to reveal and explain different properties of the function. (Limit to linear; quadratic; exponential.) (Note: FA.FIF.8b is not a Graduation Standard.) b. Interpret expressions for exponential functions by using the properties of exponents.	**A1.PAFR.2.1** Transform linear, quadratic, exponential, and linear absolute value functions to equivalent forms to identify slope and y-intercept for linear, vertex, and roots (if any) for quadratic and linear absolute value, and y-intercept for exponential.
IA.FIF.9* Compare properties of two functions given in different representations such as algebraic, graphical, tabular, or verbal.	**A1.PAFR.4.3** Given different representations of two different functions, compare key features including intercepts, domain and range, intervals of increasing and decreasing, constant, average rate of change, and maximum and minimum values.

Linear, Quadratic, and Exponential

2015 Standard	*Correlating 2025 Indicator*
IA.FLQE.2* Create symbolic representations of linear and exponential functions, including arithmetic and geometric sequences, given graphs, verbal descriptions, and tables.	**A1.PAFR.2.5** Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. **A1.PAFR.2.6** Create symbolic representations of linear and exponential functions, including arithmetic and geometric sequences, given graphs, verbal descriptions, and tables.
IA.FLQE.5* Interpret the parameters in a linear or exponential function in terms of the context.	**A1.PAFR.2.3** Solve and graph linear, quadratic, exponential, and linear absolute value equations given in tabular, symbolic, and/or verbal forms using intercepts, domain and range, intervals of increasing and decreasing, vertex (maximum and minimum), end-behavior, and symmetry, and interpret these in terms of mathematical and real-world situations.

Complex Number System

2015 Standard	*Correlating 2025 Indicator*
IA.NCNS.1* Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a+bi$ with a and b real.	**A2P.NR.1.1** Understand that there is an imaginary unit i such that $i^2 = -1$ and explain the structure of a complex number as $a + bi$, where a and b are real.
IA.NCNS.7* Solve quadratic equations in one variable that have complex solutions.	**A2.PAFR.1.1** Graph, identify, and analyze quadratic functions in mathematical and real-world situations.

Standards NOT in the Crosswalk

The following standards are 2025 Algebra 1 Standards that do not crosswalk to Foundations in Algebra or Intermediate Algebra. These will need to be included in the 2025 Intermediate Algebra course in order for students to be successful on the Algebra 1 EOCEP.

A1.DPSR.2.3 Use a linear model to interpolate and extrapolate unknown values close to the data set.

A1.PAFR.2.10 Analyze the growth/decay rate between linear and exponential functions specifically between consecutive integers.