South Carolina College- and Career-Ready (SCCCR) Intermediate Algebra

Key Concepts	Standards
Arithmetic with Polynomials and Rational Expressions	**The student will:**
	IA.AAPR.1* Add, subtract, and multiply polynomials and understand that polynomials are closed under these operations.
Creating Equations	**The student will:**
	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.
	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.
	IA.ACE.4* 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	**The student will:**
	IA.AREI.2* Solve simple rational and radical equations in one variable and understand how extraneous solutions may arise.
	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.
	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 $y = g(x)$.
Structure and Expressions	**The student will:**
	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.
	IA.ASE.2* Analyze the structure of binomials, trinomials, and other polynomials in order to rewrite equivalent expressions.
	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.
Building Functions	**The student will:**
	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.
	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.
	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.

		The student will:
Interpreting Functions	IA.FIF.3*	Define functions recursively and recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.
	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.
	IA.FIF.5*	Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
	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.
	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.
	IA.FIF.8*	Translate between different but equivalent forms of a function equation to reveal and explain different properties of the function. *(Note: IA.FIF.8b is not a Graduation Standard.)* b. Interpret expressions for exponential functions by using the properties of exponents.
	IA.FIF.9*	Compare properties of two functions given in different representations such as algebraic, graphical, tabular, or verbal.

		The student will:
Linear, Quadratic, and Exponential	IA.FLQE.2*	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.

		The student will:
Complex Number System	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.
	IA.NCNS.7*	Solve quadratic equations in one variable that have complex solutions.