South Carolina College- and Career-Ready (SCCCR) Foundations in Algebra

Key Concepts	Standards	
Creating Equations	**The student will:**	
	FA.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. (Limit to linear; quadratic; exponential with integer exponents.)
	FA.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. (Limit to linear; quadratic; exponential with integer exponents; direct and indirect variation.)
	FA.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:**	
	FA.AREI.1*	Understand and justify that the steps taken when solving simple equations in one variable create new equations that have the same solution as the original.
	FA.AREI.3*	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
	FA.AREI.5	Justify that the solution to a system of linear equations is not changed when one of the equations is replaced by a linear combination of the other equation.

	FA.AREI.6*	Solve systems of linear equations algebraically and graphically focusing on pairs of linear equations in two variables. *(Note: FA.AREI.6a and 6b are not Graduation Standards.)*
		    a. Solve systems of linear equations using the substitution method.
		    b. Solve systems of linear equations using linear combination.

	FA.AREI.10*	Explain that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.
	FA.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 $y = g(x)$. (Limit to linear; quadratic; exponential.)
	FA.AREI.12*	Graph the solutions to a linear inequality in two variables.
Structure and Expressions	**The student will:**	
	FA.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. (Limit to linear; quadratic; exponential.)
Building Functions	**The student will:**	
	FA.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. (Limit to linear; quadratic; exponential with integer exponents; vertical shift and vertical stretch.)
Interpreting Functions	**The student will:**	

	FA.FIF.1*	Extend previous knowledge of a function to apply to general behavior and features of a function.
		    a. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range.
		    b. Represent a function using function notation and explain that $f(x)$ denotes the output of function f that corresponds to the input x.
		    c. Understand that the graph of a function labeled as f is the set of all ordered pairs (x, y) that satisfy the equation $y = f(x)$.

	FA.FIF.2*	Evaluate functions and interpret the meaning of expressions involving function notation from a mathematical perspective and in terms of the context when the function describes a real-world situation.
	FA.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. (Limit to linear; quadratic; exponential.)
	FA.FIF.5*	Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes. (Limit to linear; quadratic; exponential.)
	FA.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. (Limit to linear; quadratic; exponential only in the form $y = a^x + k$.)

	FA.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.8a is not a Graduation Standard.)* a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
	FA.FIF.9*	Compare properties of two functions given in different representations such as algebraic, graphical, tabular, or verbal. (Limit to linear; quadratic; exponential.)
Linear, Quadratic, and Exponential	**The student will:**	
	FA.FLQE.1*	Distinguish between situations that can be modeled with linear functions or exponential functions by recognizing situations in which one quantity changes at a constant rate per unit interval as opposed to those in which a quantity changes by a constant percent rate per unit interval. *(Note: FA.FLQE.1a is not a Graduation Standard.)* a. Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.
	FA.FLQE.3*	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or more generally as a polynomial function.
	FA.FLQE.5*	Interpret the parameters in a linear or exponential function in terms of the context. (Limit to linear.)
Quantities	**The student will:**	
	FA.NQ.1*	Use units of measurement to guide the solution of multi-step tasks. Choose and interpret appropriate labels, units, and scales when constructing graphs and other data displays.
	FA.NQ.2*	Label and define appropriate quantities in descriptive modeling contexts.
	FA.NQ.3*	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities in context.
Real Number System	**The student will:**	
	FA.NRNS.1*	Rewrite expressions involving simple radicals and rational exponents in different forms.
	FA.NRNS.2*	Use the definition of the meaning of rational exponents to translate between rational exponent and radical forms.
	FA.NRNS.3	Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
Interpreting Data	**The student will:**	
	FA.SPID.5*	Analyze bivariate categorical data using two-way tables and identify possible associations between the two categories using marginal, joint, and conditional frequencies.
	FA.SPID.6*	Using technology, create scatterplots and analyze those plots to compare the fit of linear, quadratic, or exponential models to a given data set. Select the appropriate model, fit a function to the data set, and use the function to solve problems in the context of the data.
	FA.SPID.7*	Create a linear function to graphically model data from a real-world problem and interpret the meaning of the slope and intercept(s) in the context of the given problem.
	FA.SPID.8*	Using technology, compute and interpret the correlation coefficient of a linear fit.
Making Inferences and Justifying Conclusions	**The student will:**	
	FA.SPMJ.1*	Understand statistics and sampling distributions as a process for making inferences about population parameters based on a random sample from that population.
	FA.SPMJ.2*	Distinguish between experimental and theoretical probabilities. Collect data on a chance event and use the relative frequency to estimate the theoretical probability of that event. Determine whether a given probability model is consistent with experimental results.
Using Probability to Make Decisions	**The student will:**	
	FA.SPMD.4*	Use probability to evaluate outcomes of decisions by finding expected values and determine if decisions are fair.
	FA.SPMD.5*	Use probability to evaluate outcomes of decisions. Use probabilities to make fair decisions.
	FA.SPMD.6*	Analyze decisions and strategies using probability concepts.