

Advanced Functions and Modeling

NC Standard Course of Study: Advanced Functions and Modeling			
GOAL 1: The learner will analyze data and apply probability concepts to solve problems.		GOAL 2: The learner will use functions to solve problems.	
1.01	<p>Create and use calculator-generated models of linear, polynomial, exponential, trigonometric, power, and logarithmic functions of bivariate data to solve problems.</p> <p>a) Interpret the constants, coefficients, and bases in the context of the data.</p> <p>b) Check models for goodness-of-fit; use the most appropriate model to draw conclusions and make predictions.</p>	2.01	<p>Use logarithmic (common, natural) functions to model and solve problems; justify results.</p> <p>a) Solve using tables, graphs, and algebraic properties.</p> <p>b) Interpret the constants, coefficients, and bases in the context of the problem.</p>
		2.02	<p>Use piecewise-defined functions to model and solve problems; justify results.</p> <p>a) Solve using tables, graphs, and algebraic properties.</p> <p>b) Interpret the constants, coefficients, and bases in the context of the problem.</p>
1.02	<p>Summarize and analyze univariate data to solve problems.</p> <p>a) Apply and compare methods of data collection.</p> <p>b) Apply statistical principles and methods in sample surveys.</p> <p>c) Determine measures of central tendency and spread.</p> <p>d) Recognize, define, and use the normal distribution curve.</p> <p>e) Interpret graphical displays of univariate data.</p> <p>f) Compare distributions of univariate data.</p>	2.03	<p>Use power functions to model and solve problems; justify results.</p> <p>a) Solve using tables, graphs, and algebraic properties.</p> <p>b) Interpret the constants, coefficients, and bases in the context of the problem.</p>
		2.04	<p>Use trigonometric (sine, cosine) functions to model and solve problems; justify results.</p> <p>a) Solve using tables, graphs, and algebraic properties.</p> <p>b) Create and identify transformations with respect to period, amplitude, and vertical and horizontal shifts.</p> <p>c) Develop and use the law of sines and the law of cosines.</p>
1.03	<p>Use theoretical and experimental probability to model and solve problems.</p> <p>a) Use addition and multiplication principles.</p> <p>b) Calculate and apply permutations and combinations.</p> <p>c) Create and use simulations for probability models.</p> <p>d) Find expected values and determine fairness.</p> <p>e) Identify and use discrete random variables to solve problems.</p> <p>f) Apply the Binomial Theorem.</p>	2.05	<p>Use recursively-defined functions to model and solve problems.</p> <p>a) Find the sum of a finite sequence.</p> <p>b) Find the sum of an infinite sequence.</p> <p>c) Determine whether a given series converges or diverges.</p> <p>d) Translate between recursive and explicit representations.</p>