

Advanced Functions and Modeling (2003): Grades 9, 10, 11, 12

Adopted 2003

Data Analysis and Probability, Algebra

1. The learner will analyze data and apply probability concepts to solve problems.

01. Create and use calculator-generated models of linear, polynomial, exponential, trigonometric, power, and logarithmic functions of bivariate data to solve problems. 1.01
 - a. Interpret the constants, coefficients, and bases in the context of the data. 1.01.A
 - b. Check models for goodness-of-fit; use the most appropriate model to draw conclusions and make predictions. 1.01.B
02. Summarize and analyze univariate data to solve problems. 1.02
 - a. Apply and compare methods of data collection. 1.02.A
 - b. Apply statistical principles and methods in sample surveys. 1.02.B
 - c. Determine measures of central tendency and spread. 1.02.C
 - d. Recognize, define, and use the normal distribution curve. 1.02.D
 - e. Interpret graphical displays of univariate data. 1.02.E
 - f. Compare distributions of univariate data. 1.02.F
03. Use theoretical and experimental probability to model and solve problems. 1.03
 - a. Use addition and multiplication principles. 1.03.A
 - b. Calculate and apply permutations and combinations. 1.03.B
 - c. Create and use simulations for probability models. 1.03.C
 - d. Find expected values and determine fairness. 1.03.D
 - e. Identify and use discrete random variables to solve problems. 1.03.E
 - f. Apply the Binomial Theorem. 1.03.F

2. The learner will use functions to solve problems.

01. Use logarithmic (common, natural) functions to model and solve problems; justify results. 2.01
 - a. Solve using tables, graphs, and algebraic properties. 2.01.A
 - b. Interpret the constants, coefficients, and bases in the context of the problem. 2.01.B
02. Use piecewise-defined functions to model and solve problems; justify results. 2.02
 - a. Solve using tables, graphs, and algebraic properties. 2.02.A
 - b. Interpret the constants, coefficients, and bases in the context of the problem. 2.02.B
03. Use power functions to model and solve problems; justify results. 2.03
 - a. Solve using tables, graphs, and algebraic properties. 2.03.A
 - b. Interpret the constants, coefficients, and bases in the context of the problem. 2.03.B
04. Use trigonometric (sine, cosine) functions to model and solve problems; justify results. 2.04
 - a. Solve using tables, graphs, and algebraic properties. 2.04.A
 - b. Create and identify transformations with respect to period, amplitude, and vertical and horizontal shifts. 2.04.B
 - c. Develop and use the law of sines and the law of cosines. 2.04.C
05. Use recursively-defined functions to model and solve problems. 2.05
 - a. Find the sum of a finite sequence. 2.05.A
 - b. Find the sum of an infinite sequence. 2.05.B
 - c. Determine whether a given series converges or diverges. 2.05.C
 - d. Translate between recursive and explicit representations. 2.05.D