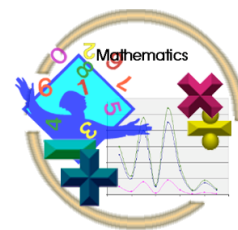


Functions, Statistics, & Trigonometry

Grades 9-12



Standard 1: The student uses a variety of strategies in the problem-solving process.

1.1 Use a variety of strategies to understand new mathematical content and to develop more efficient solution methods or problem extension

1.2 Understand the components of mathematical modeling (i.e., problem formulation, mathematical model, solution within the model, interpretation of solution).

Standard 3: The student uses basic and advanced procedures while performing the process of computation and estimation.

3.1 Select and use appropriate computational methods (e.g., mental, paper-and-pencil, calculator, computer) for given problem-solving situation

3.2 Use sequences & series (arithmetic and geometric); their limits

3.3 Understand the laws of exponents/logarithms as they apply to both rational and real numbers

Standard 4: The student understands and applies the basic and advanced properties of patterns, function and algebra.

Algebra:

4.1 Use a variety of methods (e.g., graphs, algebraic methods, matrices) to solve systems of equations and inequalities

4.2 Solving and finding the roots of polynomial equations using a variety of methods

4.3 Solve equations involving exponential and logarithmic terms

4.4 Expanding binomials

Functions:

4.5 Understand addition and composition of functions and properties of these operations

4.6 Understand the concept of inverse function and the corresponding graph

4.7 Understand polynomial, rational, algebraic, step, and transcendental functions and their graphs

4.8 Locate the extrema of a function to solve real-world problems

Trigonometry:

4.9 Recognizes special angles (eg 30-45-60-90), and knows their exact trig values to solve trigonometric problems

4.10 Understand the basic concepts of trigonometric functions (e.g., amplitude, period, phase shift) and their graphs, including basic transformations

4.11 Solve trigonometric equations and applying the Law of Sines/Cosines

4.12 Use trigonometric identities (e.g., Pythagorean identities, double-angle, half-angle, addition and subtraction formulas/identities) to solve and simplify equations

Standard 5: The student understands and applies basic and advanced concepts of statistics and data analysis.

5.1 Select and use the best method of representing and describing a set of data (e.g., scatter plot, line graph, histogram, box plot).

5.2 Understand measures of central tendency (e.g., mean, median, mode) and variability (e.g., standard deviation, quartile, percentiles, variance) and their applications to specific situations

5.3 Understand the properties of the normal curve, and how the normal curve can be used to answer questions about sets of data

5.4 Be able to use hypothesis testing (one tailed/two tailed) using normal approximations of binomial situations.

Standard 6: The student understands and applies basic and advanced concepts of probability.

6.1 Use a variety of experimental, simulation, and theoretical methods (e.g., counting procedures, formulas for permutations and combinations, Monte Carlo simulations with random number generators, statistical experiments) to determine probabilities

6.2 Understand how the coefficients of the terms in the expansion of a power of a binomial relate to the frequency of events in a binomial probability distribution

Standard 7: The student understands and applies basic and advanced properties of the concepts of geometry.

7.1 Understand transformations of the graphs of polynomial, rational, algebraic, trigonometric, and exponential/logarithmic functions

7.2 Understand Matrix translations, transformations, and rotations

Standard 9: The student understands and applies basic and advanced properties of the structure of mathematics.

9.1 Use formal mathematical language and notation to represent ideas, to demonstrate relationships within and among representation systems, and to formulate generalizations

9.2 Understand connections between equivalent representations and corresponding procedures of the same problem situation or mathematical concept (e.g., a zero of a function corresponds to an x-intercept of the graph of the function, a system of equations can be represented and solved by a matrix equation)