



Mathematics Exam Snapshot

Time Allowed:	240 minutes	
Format:	Multiple-choice	
Number of Questions:	125	
On-Screen Exhibits: (available as relevant)	None	
Passing Score:	Proficient: 272 Distinguished: 340	(The number of questions answered correctly is converted to a scaled score ranging from 0 to 500.)
Exam Summary:	Content Domains	Approximate Percentage of Examination
	Number Sense	12%
	Algebra and Functions	26%
	Geometry and Measurement	20%
	Trigonometry	11%
	Probability, Statistics, and Data Analysis	12%
	Linear Algebra	6%
	Calculus	13%

About This Exam

The American Board for Certification of Teacher Excellence believes that highly skilled mathematics teachers should possess a comprehensive body of mathematical knowledge that is research-based and promotes student achievement. The mathematics exam is a rigorous assessment of a candidate's knowledge and application of mathematic concepts. Most topics assessed are characteristically covered in introductory college level mathematics courses, although some more advanced topics are included, as teachers must hold a more sophisticated understanding of mathematics content than that presented to their students. Use of a calculator is not permitted.



Number Sense

- Rational numbers as fractions, finite or repeating decimals, and percents
- Arithmetic properties of subsets of integers and rational, irrational, and real numbers
- Addition, subtraction, multiplication, and division of rational numbers, complex numbers, monomials, binomials, polynomials, algebraic fractions, and mixed expressions
- Fundamental Theorem of Arithmetic
- Number theoretic concepts of primes, factors, and multiples
- Absolute value of real numbers
- Rate, ratio, percent, and proportion
- Associative, distributive, and commutative properties
- Approximation of the value of irrational numbers
- Squares, square roots, cubes and cube roots, and the n th root
- Rules of exponents
- Laws of logarithms

Algebra and Functions

- Concepts of relation and function
- Arithmetic series
- Finite and infinite geometric series
- Systems of linear equations and inequalities
- Operations on polynomials and rational expressions
- Factoring polynomials
- Quadratic equations and functions
- Fractional exponents
- Exponential functions
- Fundamental Theorem of Algebra

Geometry and Measurement

- Principles and concepts underlying two and three-dimensional objects
- Regularity, congruence, similarity, and symmetry of geometric figures
- Definitions and properties of lines, angles, and bisectors
- Coordinate geometry and parallelism, perpendicularity, and distance
- Special triangles and their properties
- Theorems concerning parallel and perpendicular lines, angles, congruent and similar triangles, circles, and convex polygons
- Proofs of simple Euclidean theorems
- Conversion between measurement units using dimensional analysis
- Composite measures
- Measurement precision and accuracy
- Linear, square, and cubic measures

Trigonometry

- The Pythagorean Theorem
- Basic trigonometric ratios
- Angle and side relationships in special right triangles
- Angle measures in degrees and radians
- Law of sines and law of cosines
- Amplitude, frequency, period, and phase shift
- Trigonometric and inverse trigonometric functions
- Rectangular and polar coordinates of a point



Probability, Statistics, and Data Analysis

- Probability in simple situations
- Computation of combinations and permutations
- Probability in finite sample spaces
- Conditional probability
- Measures of central tendency
- Variance and standard deviation
- Distributions of data

Linear Algebra

- Linear equations and systems
- Geometric interpretation of matrices and vectors
- Matrix manipulation, matrix algebra, and the Gauss-Jordan method
- Inverse matrices
- Scalar (dot) products and cross products of vectors

Calculus

- Limits, derivatives, continuity, and integrals
- Theorems evaluating limits of the sums, products, quotients, and composition of functions
- Chain rule
- Parametrically defined functions
- Rolle's Theorem
- L'Hopital's rule
- Fundamental Theorem of Calculus
- Differential equations
- Taylor series