



EmSAT Math Achieve 2018

Total Time for Test: 60 questions: 2 hours

EmSAT Math Achieve is a computer-based test and has 3 major sections - Algebra, Geometry, and Statistics. Test sections, questions, and options are randomized. Sections and subsections of the test are timed by the computer. Test takers can see how much time they have throughout the test.

Section 1: Algebra

- Interpret the structure of expressions
 - Write expressions in equivalent forms to solve problems
 - Perform arithmetic operations on polynomials
 - Understand the relationship between zeros and factors of polynomials
 - Use polynomial identities to solve problems
 - Rewrite rational functions
 - Create equations that describe numbers or relationships
 - Understand solving equations as a process of reasoning and explain the reasoning
 - Solve equations and inequalities in one variable
 - Solve systems of equations
 - Represent and solve equations and inequalities graphically
 - Understand the concept of a function and use function notation
 - Interpret functions that arise in applications in terms of the context
 - Analyze functions using different representations
 - Build a function that models a relationship between two quantities
 - Build new functions from existing functions
 - Construct and compare linear and exponential models and solve problems
 - Interpret expressions for functions in terms of the situation they model
 - Extend the domain of trigonometric functions using the unit circle
 - Model periodic phenomena with trigonometric functions
 - Prove and apply trigonometric identities
 - Extend the properties of exponents to rational exponents
 - Use properties of rational and irrational numbers.
 - Reason quantitatively and use units to solve problems
 - Perform operations with complex numbers
 - Represent and model with vector quantities.
 - Perform operations on vectors.
 - Perform operations on matrices and use matrices in applications
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Section 2: Geometry

- Experiment with transformations in the plane
 - Understand congruence in terms of rigid motions
 - Prove geometric theorems
 - Understand similarity in terms of similarity transformations
 - Prove theorems involving similarity
 - Define trigonometric ratios and solve problems involving right triangles
 - Apply trigonometry to general triangles
 - Understand and apply theorems about circles
 - Translate between the geometric description and the equation for a conic section
 - Use coordinates to prove simple geometric theorems algebraically
 - Explain volume formulas and use them to solve problems
 - Visualize relationships between two-dimensional and three-dimensional objects
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Section 3: Statistics

- Summarize, represent, and interpret data on a single count or measurement variable
 - Summarize, represent, and interpret data on two categorical and quantitative variables
 - Interpret linear models
 - Understand and evaluate random processes underlying statistical experiments
 - Make inferences and justify conclusions from sample surveys, experiments and observational studies
 - Understand independence and conditional probability and use them to interpret data
 - Use the rules of probability to compute probabilities of compound events in a uniform probability model
 - Calculate expected values and use them to solve problems
 - Use probability to evaluate outcomes of decisions
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