Tennessee's State Mathematics Standards | Senior Finite Math

Category	Domain	Standards
Number and Quantity	Matrix operations (N-M)	1. Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network. 2. Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled. 3. Add, subtract, and multiply matrices of appropriate dimensions.
	Financial mathematics (N-NQ)	1. Define interest, compound interest, annuities, sinking funds, amortizations, annuities, future value and present value. 2. Recognize the importance of applying a financial model to business. 3. Determine future value and present value of an annuity. 4. Determine the amortization schedule for an annuity and a home mortgage. 5. Apply financial mathematics to depreciation schedules. 6. Solve contextual problems involving financial decision-making. 7. Apply arithmetic and geometric sequences to simple and compound interest, annuities, loans, and amortization. 8. Solve problems in mathematics of finance involving compound interest using exponential and logarithmic techniques. 9. Know when to use transcendental functions to accomplish various application purposes such as predicting population growth. 10. Use orders of magnitude estimates for determining an appropriate model for a contextual situation.
Algebra	Exponential and logarithmic expressions (A-EL)	1. Define logarithms. 2. Use properties of logarithms to expand and condense logarithmic expressions. 3. Understand the relationships between exponential and logarithmic expressions. 4. Use exponential and logarithmic relationships to model, predict, and solve contextual problems.
	Linear systems, matrices and their applications (A-LM)	1. Find and use the inverse of a matrix to solve a contextual problem. 2. Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3x3 or greater). 3. Use matrices to solve systems of linear equations, including the echelon method and the Gauss-Jordan method. 4. Recognize the existence of infinite solutions to systems of linear equations; express these solutions in parametric form. 5. Identify and write the general solution to a system of linear equations; in the case of an infinite solution set, select various particular solutions given specific properties. 6. Use Markov Chains to solve problems.
	Linear programming (A-LP)	1. Use mathematical models involving equations and systems of equations to represent, interpret, and analyze quantitative relationships, change in various contexts, and other real-world phenomena. 2. Read, interpret, and solve linear programming problems graphically and by computational methods. 3. Use linear programming to solve optimization problems. 4. Interpret the meaning of the maximum or minimum value in terms of the objective function.

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Functions	**Transcendental Functions (F-TF)**	1. Describe transcendental functions through various representations, including words, equations, tables, and graphs; discuss how they are used in modeling contextual situations. 2. Use the language and notation of functions to develop models of real-world phenomena. 3. Analyze the effect of changing various parameters on transcendental functions and their graphs.
Geometry and Measurement	**Set Theory (G-ST)**	1. Define sets, subsets, proper subsets and empty sets with correct notation. 2. Analyze and compare sets, including using Venn Diagrams. 3. Perform set operations such as union, intersection, complement, and set difference. 4. Operate with sets and use set theory to solve problems.
	Investigate logic (G-L)	1. Define the order of operations for the logical operators. 2. Define conjunction, disjunction, negation, conditional, and biconditional. 3. Solve a variety of logic puzzles. 4. Construct and use a truth table to draw conclusions about a statement. 5. Apply the laws of logic to judge the validity of arguments. 6. Give counterexamples to disprove statements. 7. Analyze arguments with quantifiers through the use of Venn diagrams. 8. Represent logical statements with networks.
	Apportionment (G-A)	1. Understand the mathematical basis of apportionment principles and paradoxes. 2. Discuss the differences between two different types of apportionment and construct an example illustrating them. 3. Compare apportionments between states and the validity of the resulting representations.

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Data Analysis, Statistics, and Probability	**Develop concepts in probability (D-CP)**	1. Differentiate between permutations and combinations. 2. Evaluate expressions indicating permutations or combinations. 3. Define the relationship between permutations and the multiplication principle. 4. Use permutations and combinations to compute probabilities of compound events and solve problems. 5. Understand and apply the relationship between conditional probabilities and the probabilities of the individual events. 6. Calculate conditional probabilities using Bayes Theorem.
	Organize and Interpret data (D-ID)	1. Organize data for problem solving. 2. Use a variety of counting methods to organize information, determine probabilities, and solve problems. 3. Analyze survey data using Venn diagrams. 4. Calculate and interpret statistical problems using measures of central tendency and graphs. 5. Translate from one representation of data to another, e.g., a bar graph to a circle graph. 6. Calculate expected value, e.g., to determine the fair price of an investment. 7. Evaluate and compare two investments or strategies, where one investment or strategy is safer but has lower expected value. Include large and small investments and situations with serious consequences.