

TOPICS TO STUDY FOR MATHCON

- ❖ The following topics provide a framework for MathCON.
- ❖ These topics are not curriculum.
- ❖ It is recommended that students review previous grade topics.
- ❖ Any grade level's topics are related to the previous grade level and promote continuous improvement over the years.
- ❖ A MathCON test consists of multiple-choice questions covering the following topics:
Algebra, Geometry, Number Theory, and Combinatorics
- ❖ There could be questions from different topics that aren't listed below at MathCON.

TOPICS TO STUDY FOR MATHCON

11TH GRADE MATH

- ❖ Functions, domain and range
- ❖ Add, subtract, multiply, and divide functions
- ❖ Composition of functions, inverse functions
- ❖ Transformation and symmetry (Rotations, reflections, translations, tessellation, dilation, and symmetry)
- ❖ Quadratic functions
- ❖ Polynomials
- ❖ Pascal's triangle and the Binomial Theorem
- ❖ Rational functions: asymptotes and excluded values, inverse of a rational function
- ❖ Exponential and logarithmic functions and their graphs
- ❖ Exponential and logarithmic equations and inequalities
- ❖ Radical functions and equations
- ❖ Roots and rational exponents
- ❖ Solving systems of equations and graphing
- ❖ Solving inequalities and systems of inequalities and graphing
- ❖ Matrices, Multiply two matrices, Inverse of a matrix, Determinant of a matrix
- ❖ Trigonometry, trigonometric ratios, unit circle,
- ❖ Trigonometric functions and inverse trigonometric functions
- ❖ Law of Sines, Law of Cosines
- ❖ Graphs of trigonometric functions
- ❖ Conic sections (Parabolas, Circles, Ellipses, Hyperbolas and their equations)
- ❖ Real numbers
- ❖ Complex numbers, operations with complex numbers
- ❖ Graph of complex numbers
- ❖ Rectangular form and polar form of complex numbers
- ❖ Two- and three-dimensional vectors
- ❖ Addition, subtraction and multiplication of vectors
- ❖

TOPICS TO STUDY FOR MATHCON

- ❖ Arithmetic and geometric sequences and series
- ❖ Sigma notation
- ❖ Permutation, Combination and Probability
- ❖ Expected values, Variance, Standard deviation, binomial distribution, regression, confidence intervals
- ❖ Limits, limits of polynomials and rational functions
- ❖ Limits involving factorization and rationalization
- ❖ Continuity
- ❖ Rate of change
- ❖ Derivatives, Derivatives using limits