

## 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

## 12<sup>TH</sup> GRADE MATH

- ❖ Functions, domain and range
- ❖ Composition of functions, inverse functions
- ❖ Transformation and symmetry (Rotations, reflections, translations, tessellation, dilation, and symmetry)
- ❖ Trigonometry, trigonometric ratios, unit circle,
- ❖ Trigonometric functions and inverse trigonometric functions
- ❖ Law of Sines, Law of Cosines
- ❖ Graphs of trigonometric functions
- ❖ Exponential and logarithmic functions and their graphs
- ❖ Exponential and logarithmic equations and inequalities
- ❖ Limits, limits of polynomials, rational functions, absolute value functions, trigonometric functions
- ❖ Continuity
- ❖ Rate of change
- ❖ Derivatives, Derivatives using limits, Derivative rules
- ❖ Calculating derivatives
- ❖ Derivatives of polynomials, rational functions, trigonometric functions, inverse trigonometric functions, exponential functions, logarithmic functions
- ❖ Calculating higher derivatives
- ❖ Applications of Differentiation
- ❖ Integrals
- ❖ Applications of Integration
- ❖ Matrices, Multiply two matrices, Inverse of a matrix, Determinant of a matrix