

## Pre-Cal End of Course Concepts to Know

- Slope
- Distance Formula
- Writing equation of a line (slope-intercept, standard forms)
- Parallel, perpendicular lines
- Characteristics of graphs (domain, range, increasing/decreasing, positive/negative, relative extrema)
- Domain given a function
- Determining if a function is even/odd
- Finding the inverse function (relationships between a function and its inverse)
- Transformations (translation, dilations (stretch/compression), and reflection)
- Factoring
- Finding the vertex from standard form  $(-b/2a)$
- Putting in vertex form by completing the square
- Writing the equation of a parabola given the vertex and point
- Leading Coefficient Test to describe end behavior
- Writing polynomials given zeros/roots (radical and imaginary numbers come in conjugate pairs)
- Synthetic division
- Long division
- Remainder Theorem / Factor Theorem
- Rational Root Theorem (p/q method)
- Powers of  $i$  and simplifying square root of a negative number
- Complex numbers (adding, subtracting, multiplying, and dividing – multiplying by the conjugate)
- Asymptotes – Vertical, Horizontal, Slant
- Points of Removable Discontinuity (holes)
- Graphing Rational Functions
- Log form to exponential form/exponential form to log form
- Properties of Logs
- Log expansion
- Write as a single log
- Solving exponential equations/ solving log and ln equations
- Graphs of exponential and log functions
- Converting between radians to degrees and degrees to radians
- Coterminal angles
- Reference angle
- Special Right Triangles
- Finding exact values of trig ratios using the unit circle
- All Students Take Calculus
- Using right triangles to find trig ratios (along with ASTC to get the signs correct)
- Solving for trig equation for theta (e.g  $\sin \theta = \frac{1}{2}$ ; find theta)
- Simplifying/proving trig identities
- Characteristics of Trig functions (Amplitude, Period, Phase shift, Vertical Shift)
- Solving Trig Equations
- Using Sum and Difference Formula and Double Angle Formulas
- Law of sines and cosines
- Heron's Formula
- Vectors (component form, magnitude, adding and subtracting, dot product)
- Trig form of a complex number

- DeMoivre's Theorem
- Systems
- Partial Fraction Decomposition
- Matrices (adding, subtracting, multiplying)
- Arithmetic and geometric sequences/series (Sigma Notation/Finding partial and infinite sum)
- Polar – coordinates
- Polar – Conversion from rectangular to polar vice versa (points and equations)
- Polar – Graphs
- Average Rate
- Local and global extrema, inflection point, and concavity
- Direct, inverse variation
- Recognizing Linear, Quadratic, Exponential given table of values
- Regression