

# Pre-Cal Year at a Glance

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## 1<sup>st</sup> Six Weeks

### Chapter 0 Preparing for Precalculus

- Sets
- Operations with Complex Numbers
- Quadratic Functions & Equations
- $n^{\text{th}}$  Roots & Real Exponents
- Systems of Linear Equations & Inequalities
- Matrix Operations
- Probability with Permutations & Combinations
- Statistics

### Chapter 1 Functions from a Calculus Perspective

- Functions
- Analyzing Graphs of Functions & Relations
- Continuity, End Behavior, & Limits
- Extrema & Average Rates of Change
- Parent Functions & Transformations
- Function Operations & Composition of Functions
- Inverse Relations & Functions

### Chapter 2 Power, Polynomial, & Rational Functions

- Power & Radical Functions
- Polynomial Functions
- The Remainder & Factor Theorems
- Zeros of Polynomial Functions
- Rational Functions
- Nonlinear Inequalities

## 2<sup>nd</sup> Six Weeks

### Chapter 3 Exponential & Logarithmic Functions

- Exponential Functions
- Logarithmic Functions
- Properties of Logarithms
- Exponential & Logarithmic Equations
- Modeling with Nonlinear Regression

### Chapter 4 Trigonometric Functions

- Right Triangle Trigonometry
- Degrees & Radians
- Trigonometric Functions on the Unit Circle
- Graphing Sine & Cosine Functions
- Graphing Other Trigonometric Functions
- Inverse Trigonometric Functions
- The Law of Sines and The Law of Cosines

## 3<sup>rd</sup> Six Weeks

### Chapter 5 Trigonometric Identities & Equations

- Trigonometric Identities
- Verifying Trigonometric Identities
- Solving Trigonometric Equations
- Sum & Difference Identities
- Multiple-Angle & Product-To-Sum Identities

### Chapter 6 Systems of Equations & Matrices

- Multivariable Linear Systems & Row Operations
- Matrix Multiplication, Inverses, & Determinants
- Solving Linear Systems Using Inverse & Cramer's Rule
- Partial Fractions
- Linear Optimization

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## 4<sup>th</sup> Six Weeks

### Chapter 7 Conic Sections & Parametric Equations

- Parabolas
- Ellipses & Circles
- Hyperbolas
- Rotations of Conic Sections
- Parametric Equations

### Chapter 8 Vectors

- Introduction to Vectors
- Vectors in the Coordinate Plane
- Dot Products & Vector Projections
- Vectors in 3-Dimensional Space
- Dot & Cross Products of Vectors in Space

## 5<sup>th</sup> Six Weeks

### Chapter 9 Polar Coordinates & Complex Numbers

- Polar Coordinates
- Graphs of Polar Equations
- Polar & Rectangular Forms of Equations
- Polar Forms of Conic Sections
- Complex Numbers & DeMoivre's Theorem

### Chapter 10 Sequence & Series

- Sequences, Series, & Sigma Notation
- Arithmetic Sequences & Series
- Geometric Sequences & Series
- Mathematical Induction
- The Binomial Theorem
- Functions as Infinite Series

## 6<sup>th</sup> Six Weeks

### Chapter 11 Inferential Statistics

- Descriptive Statistics
- Probability Distributions
- The Normal Distribution
- The Central Limit Theorem
- Confidence Intervals
- Hypothesis Testing
- Correlation & Linear Regression

### Chapter 12 Limits & Derivatives

- Estimating Limits Graphically
- Evaluating Limits Algebraically
- Tangent Lines & Velocity
- Derivatives
- Area Under a Curve & Integration
- The Fundamental Theorem of Calculus