Course Syllabus: Pre-Calculus 12

Platform: BCMath.ca

Curriculum Alignment: BC Ministry of Education (New Curriculum)

Course Goal: To develop the algebraic and trigonometric foundations necessary for Success in Calculus and Post-Secondary Mathematics.

Course Overview

Pre-Calculus 12 is a rigorous course designed for students who plan to pursue math, science, engineering, or business. This course focuses on the "Big Ideas" of patterns, transformations, and the inverse relationship between functions.

Learning Modules & Chapters

Unit 1: Functions and Transformations

- **Chapter 1: Transformations and Functions**
    - Vertical and horizontal translations, reflections, and stretches.
    - Inverse relations and their graphical representations.
- **Chapter 2: Radical Functions and Equations**
    - Graphing $y = \sqrt{f(x)}$ and solving radical equations algebraically.
- **Chapter 3: Polynomial Functions**
    - Factor Theorem, Remainder Theorem, and Synthetic Division.
    - Graphing and analyzing higher-degree polynomial behavior.
    - Graphing Rational Functions: vertical and oblique asymptotes

Unit 2: Trigonometry

- **Chapter 4: Trigonometry and the Unit Circle**
    - Radian measure, arc length, and coterminal angles in standard position.
- **Chapter 5: Trigonometric Functions and Graphs**
    - Analyzing period, amplitude, and phase shifts in sinusoidal functions.
- **Chapter 6: Trigonometric Identities and Equations**

    - Proving identities (Pythagorean, Sum/Difference, Double-Angle) and solving equations over a domain.

Unit 3: Exponents, Logarithms, and Financial Math

- **Chapter 7: Exponential and Logarithmic Functions**
    - Laws of Logarithms, Change of Base, and solving exponential growth/decay.
- **Chapter 8: Geometric Series and Financial Applications**
    - Infinite geometric series, investment growth, and amortization.

Unit 4: Advanced Algebraic Topics

- **Chapter 9: Conic Sections (Calculus Preparation)**
    - Circles, Ellipses, Hyperbolas, and Parabolas (Focus/Directrix).
    - Standard form and completing the square for second-degree equations.

Curricular Competencies

Throughout this course, students will:

- **Reason and Analyze:** Develop mental math strategies and use logic to solve complex problems.
- **Understand and Solve:** Apply multiple strategies to solve problems in abstract and real-world contexts.
- **Communicate and Represent:** Explain mathematical ideas using graphs, symbols, and formal mathematical language.
- **Connect and Reflect:** Relate mathematical concepts to each other and to other disciplines (like Physics and Finance).

Resources and Support

All course materials are provided for **free** to ensure equitable access to education.

- **Guided Notes:** Structured PDFs for every lesson.
- **Presentation Slides:** Visual aids for concept mastery.
- **Practice Assignments:** Targeted worksheets with answer keys.