

**Course Plan**

**Burnaby Online Program – School District #41 Burnaby**

Course: Pre-Calculus Math 12

Course Length: 10 months (approx 100 hours)

Teacher:

Email:

Phone:

IM:

**Course Description:** Students who take the Pre-Calculus Mathematics pathway will spend more time developing their understanding of symbol manipulation and of generalizations of the sophisticated mathematical concepts. Although there is an increased emphasis on the application of mathematics, the primary purpose of this pathway is to help students develop the skills needed to continue on with the study of Calculus.

**Course Organization:**

1. Pre-Calculus Mathematics 12 consists of 4 Modules.
2. Each Module contains 2 Units (8 Units in all).
3. Each Unit includes a Send-In Assignment for marks. These are written assignments. They will be marked and returned.
4. There is a test at the end of each module.

**Course Content:**

<b>Module 1</b>	Unit 1 Transformations Unit 2 Radical and Rational Functions
<b>Module 2</b>	Unit 3 Polynomials Unit 4 Exponents and Logarithms
<b>Module 3</b>	Unit 5 Circular Functions Unit 6 Trigonometric Equations and Identities
<b>Module 4</b>	Unit 7 Permutations and Combinations Unit 8 Function Notations and Operations

**How will your mark be calculated?**

Unit Assignments	30%
Module Tests	70%

### **Assignments:**

Before you write a module test, you must submit the Send-in assignments for each unit covered in the module. If you aren't sure how to do any of the questions, you should be asking for help.

### **Tests:**

Module tests cover multiple units of the course. All tests are "closed book" and will be written on-site at Burnaby Online and must be scheduled with your teacher.

### **Resources:**

Course materials are presented online using video lessons from the Content Connections courseware supplemented by internet links as needed. There is no text for this course.

### **Students are expected to:**

- contact the teacher by instant messaging, email or phone when help is needed or questions arise
- be actively engaged and submitting work on a regular basis
- inform the teacher when they will be inactive for two or more weeks.
- be aware that if they are inactive in a course for four or more weeks they may be removed from that course
- check their email at least twice a week
- create and submit completed solutions for all activities in the unit/chapter before requesting a test.
- cite all sources properly
- answer in their own words
- check that their work and tests have been marked.
- make time available to come in to Burnaby Online to write tests.
- make appointments to write tests at least 2 school days in advance.

## **Learning Outcomes:**

### **Trigonometry**

- A1. Demonstrate an understanding of angles in standard position, expressed in degrees and radians. [CN, ME, R, V]
- A2. Develop and apply the equation of the unit circle. [CN, R, V]
- A3. Solve problems, using the six trigonometric ratios for angles expressed in radians and degrees. [ME, PS, R, T, V]
- A4. Graph and analyze the trigonometric functions sine, cosine and tangent to solve problems. [CN, PS, T, V]
- A5. Solve, algebraically and graphically, first and second degree trigonometric equations with the domain expressed in degrees and radians. [CN, PS, R, T, V]
- A6. Prove trigonometric identities, using: [R, T, V]
- reciprocal identities
  - quotient identities
  - Pythagorean identities
  - sum or difference identities (restricted to sine, cosine and tangent)
  - double-angle identities (restricted to sine, cosine and tangent).

### **Relations and Functions**

- B1. Demonstrate an understanding of operations on, and compositions of, functions. [CN, R, T, V]
- B2. Demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations. [C, CN, R, V]
- B3. Demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations. [C, CN, R, V]
- B4. Apply translations and stretches to the graphs and equations of functions. [C, CN, R, V]
- B5. Demonstrate an understanding of the effects of reflections on the graphs of functions and their related equations, including reflections through the: [C, CN, R, V]
- $x$ -axis
  - $y$ -axis
  - line  $y = x$ .
- B6. Demonstrate an understanding of inverses of relations. [C, CN, R, V]
- B7. Demonstrate an understanding of logarithms. [CN, ME, R]
- B8. Demonstrate an understanding of the product, quotient and power laws of logarithms. [C, CN, R, T]
- B9. Graph and analyze exponential and logarithmic functions. [C, CN, T, V]
- B10. Solve problems that involve exponential and logarithmic equations. [C, CN, PS, R]
- B11. Demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree  $\leq 5$  with integral coefficients). [C, CN, ME]
- B12. Graph and analyze polynomial functions (limited to polynomial functions of degree  $\leq 5$ ). [C, CN, T, V]
- B13. Graph and analyze radical functions (limited to functions involving one radical). [CN, R, T, V]
- B14. Graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials or trinomials). [CN, R, T, V]

### **Permutations, Combinations and Binomial Theorem**

- C1. Apply the fundamental counting principle to solve problems. [C, PS, R, V]
- C2. Determine the number of permutations of  $n$  elements taken  $r$  at a time to solve problems. [C, PS, R, V]
- C3. Determine the number of combinations of  $n$  different elements taken  $r$  at a time to solve problems. [C, PS, R, V]
- C4. Expand powers of a binomial in a variety of ways, including using the binomial theorem (restricted to exponents that are natural numbers). [CN, R, V]

The complete Learning outcomes can be found at

[http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math\\_precalc1112.pdf](http://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math_precalc1112.pdf)