

PRE-CALCULUS 12 (ONLINE)

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SCHEDULE: Monday/Wednesday 10:00am-2:00pm
 Tuesday/Wednesday 5:00pm-9:00pm
LEARNING CENTRE HOURS: Monday-Thursday 10:00am-2:00pm
 Monday-Thursday 5:00pm-9:00pm
 The Learning Centre is closed all statutory and school holidays.

INTRODUCTION

The general objectives of Pre-Calculus 12 are to develop algebraic and graphical reasoning through the study of relations, to develop trigonometric reasoning, and to develop algebraic and numeric reasoning that involves combinatorics. The following mathematical processes have been integrated throughout the course: communication, problem solving, connections, mental mathematics and estimation, reasoning, technology, and visualization. Pre-Calculus 12 is designed to prepare students for entry into post-secondary programs that require the study of theoretical calculus.

PRESCRIBED LEARNING OUTCOMES *It is expected that students will:*

Relations and Functions

- *demonstrate an understanding of operations on, and composition of, functions*
- *demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations*
- *demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations*
- *apply translations and stretches to the graphs and equations of functions*
- *demonstrate an understanding of the effects of reflections on the graphs of functions and their related equations, including equations through the x-axis, y-axis, and the line $y = x$*
- *demonstrate an understanding of inverses of relations*
- *demonstrate an understanding of logarithms*
- *demonstrate an understanding of the product, quotient, and power laws of logarithms*
- *graph and analyze exponential and logarithmic functions*
- *solve problems that involve exponential and logarithmic equations*
- *demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree ≤ 5 with integral coefficients)*
- *graph and analyze polynomial functions (limited to polynomials of degree ≤ 5)*
- *graph and analyze radical functions (limited to functions involving one radical)*
- *graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials, or trinomials)*

Trigonometry

- *demonstrate an understanding of angles in standard position, expressed in degrees and radians*
- *develop and apply the equation of the unit circle*
- *solve problems, using the six trigonometric ratios for angles expressed in radians and degrees*
- *graph and analyze the trigonometric functions sine, cosine, and tangent to solve problems*
- *solve, algebraically and graphically, first and second degree trigonometric equations with the domain expressed in degrees and radians*
- *prove trigonometric identities, using reciprocal identities, quotient identities, Pythagorean identities, sum or difference identities, and double-angle identities*

Permutations, Combinations, and Binomial Theorem

- *apply the fundamental counting principle to solve problems*
- *determine the number of permutations of n elements taken r at a time to solve problems*
- *determine the number of combinations of n different elements taken r at a time to solve problems*
- *expand powers of a binomial in a variety of ways, including using the binomial theorem (restricted to exponents that are natural numbers)*

LEARNING RESOURCES

The Pre-Calculus 12 online course does not require a textbook. All lessons and practice materials are provided online. Access information will be provided following registration.

A graphing calculator is required for successful completion of Pre-Calculus 12. Although many questions will not require the use of a graphing calculator, there are questions where the graphing capabilities will be used either to produce a graph or to find zeros, intersection points, etc. Please note, the graphing calculator used in the online course and at Coquitlam Learning Opportunity Centre is Texas Instruments model TI-83 or TI-84.

PRE-CALCULUS 12 at CLOC

Pre-Calculus 12 (online) at CLOC is a **self-paced, self-directed** course. You will be expected to work independently and to manage your time productively. If needed, individual help is available online or face-to-face at CLOC. An important element for success in Pre-Calculus 12 will be your study skills. Successful students establish a study schedule and stick to it.

EVALUATION

Evaluation in Pre-Calculus 12 (online) includes 8 unit tests, 2 midterm tests, and a final exam. All tests include both multiple-choice and written-response questions. Please note, the online course includes Send-In Assignments that should be completed for practice but do NOT need to be submitted and will NOT be included in your final mark calculation. **All tests must be completed in person at CLOC.** To encourage mastery of course content, **one rewrite** is available for each unit test. **No rewrites** are allowed for the two midterm tests or the final exam. The tests will be weighted as follows:

<u>TEST</u>	<u>TOPIC</u>	<u>PERCENT</u>
Unit 1	Transformations	6
Unit 2	Graphing Radicals and Rationals	6
Unit 3	Polynomials	4
Unit 4	Exponents and Logarithms	8
MIDTERM I	Units 1–4	14
Unit 5	Circular Functions	8
Unit 6	Trigonometric Equations and Identities	6
Unit 7	Permutations and Combinations	6
Unit 8	Function Notation and Operations	3
MIDTERM II	Units 5–8	14
FINAL EXAM	Units 1–8	25
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