



Course: Pre-Calculus 12

Course Description:

Mathematics is a very important part of our technological society. Students require the ability to reason and communicate mathematically, to solve problems, and to understand and use mathematics. Skill in these areas creates a mathematically literate citizen. Pre-calculus 12 is designed for students who have a particular interest in mathematics, or who have career aspirations in the fields of engineering, pure and applied science, economics, some business programs, or other areas requiring a higher level of mathematics.

Big Ideas: By the end of this course, students will understand:

- Understanding the characteristics of families of **functions** allows us to model and understand relationships and to build connections between classes of functions.
- Using **inverses** is the foundation of solving equations and can be extended to relationships between functions.
- **Transformations** of shapes extend to functions and relations in all of their representations.
- Geometrical thinking and visualization can be used to explore conics and functions.

Core Competencies:

Communication

- Acquire and **communicate** mathematical ideas using appropriate language, equations, graphs and graphing technology, oral presentations.

Thinking

- Collaboratively develop, **analyze**, and carry out problem solving and research based mathematical activities.
- Reflect on experiences and accomplishments to demonstrate one's own progress in learning.
- Visualize to explore, investigate and illustrate mathematical concepts and relationships.

Personal & Social

- Demonstrate self-determination and self-regulation.

First Peoples Principles of Learning (FPPL)

- Engage in problem-solving experiences that are connected to local **First Peoples** communities, the local community, and other cultures.
- Explain and justify mathematical ideas.
- Connect mathematical concepts to each other and to other areas and personal interests.
- Incorporate **First Peoples** world views and perspectives to make connections to mathematical concepts.

Curricular Competencies:

- Reasoning and logic: inductive and deductive reasoning; predicting, generalizing, drawing conclusions through experiences including puzzles, games, and coding.
- Fluent and flexible thinking: includes using known facts and benchmarks, applying whole number strategies to rational numbers and algebraic expressions.



- Model: using concrete materials and dynamic interactive technology; representing a situation graphically or symbolically.
- Conceptual understanding developed playing with ideas, inquiry, and problem solving.
- Flexible strategies: from a repertoire of strategies, choosing an appropriate strategy to solve problems.
- Experiences: include context, strategies, approaches, language across cultures.
- Discussions: developing a mathematical community in the classroom through discourse – partner talks, small-group discussions, teacher-student conferences.
- Represent: sharing mathematical thinking of self and others, including using models, tables, graphs, words, numbers, symbols.
- Reflect: sharing mathematical thinking of self and others, including evaluating strategies and solutions, extending posing new problems and questions.
- Other areas and personal interest: to develop a sense of how mathematics helps us understand ourselves and the world around us.
- Incorporate: collaborate with local **First Peoples Elders** and knowledge keepers.

Course Content:

	Topics Covered	Assignments
Week 1 – 2 Unit 1: Polynomial Expressions and Functions	Polynomial Division, Factoring Polynomials, Relating Polynomial Functions and Equations	Quizzes In-Class Work Teacher-Student Meeting Test
Week 2 – 3 Unit 2: Absolute Value and Reciprocal Function	Absolute Value Functions, Graphing Reciprocals of Linear and Quadratic Function	Quizzes Test
Week 3 – 4 Unit 3: Relational Functions	Graphing Rational Functions with Graphing Calculator, Analyzing Rational Functions	Quizzes In-Class Work Teacher-Student Meeting Test
Week 4 – 5 Unit 4: Transforming Graphs of Functions	Translating, Reflecting, Stretching and Compressing Graphs of Functions	Quizzes In-Class Work Teacher-Student Meeting Test
Week 6 – 7 Unit 5: Geometric Sequences and Series	Geometric Sequences, Geometric Series, Graphing Geometric Sequences	Quizzes In-Class Work Teacher-Student Meeting Test
Week 8 – 9 Unit 6: Exponential and Logarithmic Functions	Graphing Exponential Functions, Analyzing and Transforming Exponential Functions	Quizzes In-Class Work Teacher-Student Meeting Test
Week 10 – 11 Unit 7: Trigonometry	The Unit Circle and Reciprocal Trigonometric Ratios, Angles in Standard Position, Radian Measure, Graphing Trigonometric Functions	Quizzes In-Class Work Teacher-Student Meeting Test



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Week 11 – 12 Unit 8: Trigonometric Equations and Identities	Solving Trigonometric Equations Graphically, Solving Trigonometric Equations Algebraically	Quizzes In-Class Work Teacher-Student Meeting Test
Week 12 - 13 Unit 9: Conics	Introduction to Conics, the Circle, the Ellipse, the Hyperbola, and the Parabola	Quizzes In-Class Work Teacher-Student Meeting Test

Resources:

Pre-Calculus 12, MyWorkText, Pearson Canada Inc. Davis et al, 2012 Pearson Canada Inc. Publishers

With respects to the First People's Principles of Learning, students may be alternatively assessed in ways that people can display knowledge and subject mastery. The alternative assessment can be storytelling, art or other expressions of self, knowing and learning. Over the course of the semester, students will incorporate from FPPL:

- Learning is holistic, reflexive, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves recognizing the consequences of one's actions (e.g. doing your homework regularly and diligently).

Assessment:

Formative (30%)

Self-assessment

Core competencies

Big Ideas

FPPL

Attendance, class participation

Summative (70%)

Tests and Quizzes

(of Curricular Competencies)

Midterm

Homework, in-class assignments

Project/Presentation

Final Exam

Attendance, class participation

Supplies Needed

pen, pencil, loose leaf paper, graph paper, binder

scientific calculator (Optional: T1-83 graphing calculator)

geometry set (compass, protractor, set squares)



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Expectations: Attendance in the classroom is mandatory. Students are expected to use their electronics responsibly, speak English, and participate in daily activities. Students will take an active role by discussing, doing work, working in partners or groups, and taking notes. Students are responsible for any missed assignments.