



Argyle Secondary School Math Department Calculus 12 Course Outline

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Calculus 12 (<https://curriculum.gov.bc.ca/curriculum/mathematics/12/calculus>)

BIG IDEAS

The **concept of a limit** is foundational to calculus.

Differential calculus develops the concept of **instantaneous rate of change**.

Integral calculus develops the concept of determining a product involving a **continuously changing** quantity over an interval.

Derivatives and integrals are **inversely related**.

CURRICULAR COMPETENCIES:

Students are expected to be able to do the following:

Reasoning and modeling

- Develop thinking strategies to solve puzzles and play games
- Explore, analyze, and apply mathematical ideas using reason, technology, and other tools
- Estimate reasonably and demonstrate fluent, flexible, and strategic thinking about number
- Model with mathematics in situational contexts
- Think creatively and with curiosity and wonder when exploring problems

Understanding and solving

- Develop, demonstrate, and apply conceptual understanding of mathematical ideas through play, story, inquiry, and problem solving
- Visualize to explore and illustrate mathematical concepts and relationships
- Apply flexible and strategic approaches to solve problems
- Solve problems with persistence and a positive disposition
- Engage in problem-solving experiences connected with place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures

Communicating and representing

- Explain and justify mathematical ideas and decisions in many ways
- Represent mathematical ideas in concrete, pictorial, and symbolic forms
- Use mathematical vocabulary and language to contribute to discussions in the classroom
- Take risks when offering ideas in classroom discourse

Connecting and reflecting

- Reflect on mathematical thinking
- Connect mathematical concepts with each other, other areas, and personal interests
- Use mistakes as opportunities to advance learning
- Incorporate First Peoples worldviews, perspectives, knowledge, and practices to make connections with mathematical concepts

CONTENT:

Students are expected to know the following:

- functions** and graphs
- limits:**
 - left and right limits
 - limits to infinity
 - continuity
- differentiation:**
 - rate of change
 - differentiation rules
 - higher order, implicit
 - applications
- integration:**
 - approximations
 - fundamental theorem of calculus
 - methods of integration
 - applications

RESOURCE MATERIALS:

- Workbook – Infinite Challenge Calculus 12 – Richard N. S. Seong.
- Locally developed supplemental packages
- Scientific Calculator required (Graphing Calculator optional)**

MARKS ASSIGNMENT:

- 80% Coursework
- 20% Final Exam

Optional - AP Calculus AB exam In May. (Not for marks)

CLASS SUPPLIES

It is essential that you come to class prepared. All students must bring a notebook for homework, a binder with lined papers and some sheets of graph paper, a pencil, an eraser, and a scientific calculator or graphing calculator. Students are NOT allowed to use their cellphones in Math class at any time.

(Student signature)

(Parent / Guardian signature)