# Unit 1: Introduction to Calculus

## Chapter 1. Rationalization

Chapter Tips: rationalization is a fundamental concept in finding the limit of an equation - a skill taught later in the course. This concept is fairly easy to understand, and assessment questions are generally composed of short-answer or multiple choice. Treat this chapter as a warm-up for what’s to come. Make sure to follow your teacher’s formatting expectations to ensure that you don’t lose involuntary marks on rationalization questions.

## Chapter 2: The Slope of a Tangent Line

Chapter Tips: this chapter clarifies the purpose of learning calculus. Teachers normally put a few definition questions on the unit test, so make sure you fully understand the difference between the secant and the tangent line. When approximating the instantaneous rate of change using secants, make sure to follow your teacher’s preference for the number of significant digits to use. This section is relatively easy as it mainly involves simple calculations (substitution).

## Chapter 3: Rates of Change

Chapter Tips: Rates of change questions are usually worth 2 to 3 marks on a test. They involve the same concepts introduced in the final unit in MHF4U, except a brief introduction to limits. Teachers will not focus on these types of questions on tests as they are introductory concepts to limits.

## Chapter 4: The Limit of a Function

Chapter Tips: this is the major concept of the unit and most test questions will revolve around this concept. Definitions, laws, graphing and formatting are extremely important in this chapter.

Limit questions can be tested in the form of 1) finding limits, 2) word problems, and 3) graphing problems; they are usually worth 4 to 5 marks on tests. Make sure you not only know how to express limits using mathematical language but also using graphs.

## Chapter 5: Properties of Limits

Chapter Tips: teachers usually test the properties of limits through communication questions and complex limit-finding questions on tests; they are usually worth 3 to 5 marks. There are many concepts in this chapter, but teachers usually mix those concepts with questions from other chapters to increase the questions’ complexity.

## Chapter 6: Continuity

Chapter Tips: Remembering the different types of discontinuities is key. Teachers usually have three ways to test you on continuity: 1) Graphing questions on tests and then asking you to identify locations of discontinuity 2) Providing a function and asking for the location of discontinuity/identifying whether if the function is continuous or not and 3) Finding the limit by removing a discontinuity.

Make sure you know all the ways in which a function can be discontinuous, and under what conditions limits exist (even if there is a discontinuity). Focus on studying the types of questions that you are least confident with.

Unit Studying Tips:

* Unit tests are usually out of 40-50 marks.
* Focus on the big questions.
* Put more attention on studying the second half of the unit.
* Create a list of questions that you are least comfortable with, and study them right before the test.
* Do all the assigned homework questions: sometimes, teachers take the exact question from your textbook and modify it.
* Try our practice test without looking at the answers; if you can score 80% and above on our practice test, you most likely will do well on your real test.

During the Test:

* Read all questions carefully; in this unit, pay particular attention to formatting and rounding as there may be different requirements depending on your teacher.
* Check over your work as many times as possible - there is no rush to hand in your work early.