# Unit 2: Derivatives

## Chapter 1: The Derivative Function

Studying Tips: this chapter begins with an introduction to the First Principles. This is the fundamental concept behind all derivative functions in the upcoming chapters. Make sure to do enough practice questions to get comfortable with all calculations based on the First Principles. You must also memorize all the cases that make a function indifferentiable; these kinds of questions not only appear in the simple one mark questions but also the slightly complex questions. Don’t worry, your teacher will only require you to use First Principles in this chapter; you will not need to use it again in later units.

## Chapter 2: The Derivatives of Polynomial Functions

Studying Tips: know your power rule! This is the most basic rule for derivatives and the easiest rule to use. Some teachers may test you on the proof of power rule; the proving question may worth at least 5 marks. We recommend you do a sufficient amount of practice questions regarding the power rule. Word problems from this chapter are very straightforward.

## Chapter 3: The Product Rule

Studying Tips: similar to the previous chapter, knowing the rule itself is the most important work that needs to be done. We recommend you do the most challenging questions from your homework, as teachers often ask difficult questions to raise the test’s level of difficulty. You also need to memorize the proof - a 5 mark giveaway.

## Chapter 4: The Quotient Rule

Studying Tips: similar to the previous chapter, knowing the rule itself is the most important work that needs to be done. We recommend you do the most challenging questions from your homework, as teachers often ask difficult questions to raise the test’s level of difficulty. Quotient rule is slightly harder than the previous two rules as it involves more calculation; make sure to do all your order of operations correctly. You also need to memorize the proof - a 5 mark giveaway.

## Chapter 5: Chain Rule (Composite Functions)

Studying Tips: chain rule is the most complex and important rule; it is like a combination of all the rules you have learned before. Most test questions will be a combination of the chain rule and another rule. Chain rule questions are usually worth 4 to 5 marks depending on its complexity. If you are comfortable with the challenging questions from previous chapters, chain rule would not be overwhelmingly difficult for you. Implicit Differentiation questions are also very important in this unit; although they may not frequently appear on a test, they are worth 4 to 5 marks. Make sure to study implicit differentiation and earn those marks.

Unit Studying Tips:

* Unit tests are usually out of 40-50 marks.
* Focus on the big questions.
* Put more attention on studying all the rules - every chapter is important - your teacher may choose two rules out of four for you to write out the proof.
* Create a list of questions that you are least comfortable with, and study them right before the test.
* Teachers often make their test questions as homework questions might be too easy.
* 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 simplifying derivatives. It is very easy to make mistakes during that process, as it involves a tricky order of operations.
* Check over your work as many times as possible - there is no rush to hand in your work early.