# Unit 5: Derivatives of Exponential and Trig Functions

## Chapter 1: Derivatives of Exponential Functions

Studying Tips: the natural number e is a new concept that most of you have not learned before. Make sure you know its properties and WHO INVENTED THIS NUMBER. Also, make sure to study the graph of e for future chapters and be able to describe its properties in words for communication questions.

## Chapter 2: Derivatives of General Exponential Functions

Studying Tips: make sure to be able to differentiate between the general rule and the rule for e. Just like when you first started learning derivatives, we recommend you do all the challenging homework questions, even the ones your teacher might not assign to you. This will help you tackle the composite questions that come in later chapters. The straightforward differentiation questions are usually one mark questions you see in a multiple-choice or fill in the blanks; the challenging differentiation questions that involve 1) finding the equation of the tangent line and 2) finding critical points may worth up to 4 marks.

## Chapter 2A: Derivatives of Natural Log Functions

Studying Tips: since natural log function is associated with the e-function, they both have shortcuts when finding their respective derivatives. Just like when you first started learning derivatives, we recommend you do all the challenging homework questions, even the ones your teacher might not assign to you. This will help you tackle the composite questions that come in later chapters. The straightforward differentiation questions are usually one mark questions you see in a multiple-choice or fill in the blanks; the challenging differentiation questions that involve 1) finding the equation of the tangent line and 2) finding critical points may worth up to 4 marks.

## Chapter 2B: Derivatives of General Log Functions

Studying Tips: The derivative function for general log functions is a little tricky to memorize; you will have to do more practice questions to fully get comfortable with it. The straightforward differentiation questions are usually one mark questions you see in a multiple-choice or fill in the blank question; the challenging differentiation questions that involve 1) finding the equation of the tangent line and 2) finding critical points may worth up to 4 marks. At the end of this chapter, we recommend you to create a summary that records all the derivative functions you have learned so far; this will help you prepare for the upcoming word problems.

## Chapter 3: Optimization problems

Studying Tips: the optimization problems from this chapter are not as difficult as the ones from unit 3. The hard part of optimization problems in this chapter is understanding the question, not the calculations. Make sure you identify which type of function you are using for each type of question. These word problems are usually worth 4 marks.

## Chapter 4: Derivatives of Sin(x) and Cos(x)

Studying Tips: the derivative functions themselves are easy to remember. The difficult part of this chapter is the word problem. The trig word problems are somewhat lengthy, but overall not very hard to understand. Teachers will not make significant tweaks to these word problems.

## Chapter 5: Derivatives of Tan(x)

Studying Tips: this is a minor concept of the unit; it is not frequently tested and rarely any word problems revolve around it. Derivatives of tan(x) usually appear on tests as the one mark questions. By the end of this chapter, we recommend you to add the newly learned derivative functions to the list you created halfway through the unit.

Unit Studying Tips:

* Unit tests are usually out of 40-50 marks.
* Know all your derivative functions.
* Create a list of questions that you are least comfortable with, and study them right before the test.
* Test questions are likely the modified versions of your homework and worksheets.
* 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; make sure to check for involuntary mistakes, especially for the derivatives of exponential and logarithmic functions.
* Make sure to follow your teacher’s expectations for the word problems.
* Check over your work as many times as possible - there is no rush to hand in your work early.