# Unit 3: Derivatives and their Applications

## Chapter 1: Velocity and Acceleration

Studying Tips: you must know all the definitions and what each concept represents in a word problem. This chapter is not the main focus of the unit, and teachers will not be testing you on too many questions from this chapter. Velocity and acceleration questions are typically worth 2-4 marks; teachers usually describe a scenario in a question and ask multiple small questions regarding that scenario.

## Chapter 2: Extreme Values

Studying Tips: this chapter prepares you for the application problems in the next chapter and builds the fundamentals for curve sketching in unit four. This chapter is overall not difficult, but make sure to fully grasp the key concepts. Set your derivative to 0!

## Chapter 3: Optimization Problems

Studying Tips: this is the most important chapter in unit 3. It mainly consists of 6 types of application questions. There aren't any shortcuts to studying for these questions except for doing as many practice questions as possible. Each word problem is worth 6 to 7 marks. Although they are lengthy, teachers most likely will not tweak the questions; these questions are tough, so teachers will not further increase their level of difficulty. We recommend you create a personalized algorithm - your preferred ways and steps - to solve such questions; this way, you will know if you are on the right track solving the problem during the actual unit test.

## Chapter 4: Optimization Problems in Economics and Finance

Studying Tips: these are the less difficult optimization problems and are typically worth 4 marks. Make sure to know all the business terms. We recommend you write down all the business terms and write the corresponding math terms beside them; this will help you identify what the question is asking you to do when it brings up certain business terms.

Unit Studying Tips:

* Unit tests are usually out of 40-50 marks.
* Focus on the optimization questions from chapter three.
* Make a study routine for this unit so that you can review the lengthy questions at an effective pace.
* Create a list of questions that you are least comfortable with, and study them right before the test.
* Teachers likely will ask the same types of questions they teach you without making too many modifications - this unit is challenging.
* Try our practice test without looking at the answers; if you can score 80% and above, you most likely will do well on your real test.

During the Test:

* Read all questions carefully; in this unit, make sure your answers to the long questions are organized. This not only helps the teacher in correcting your work but also helps you in checking your work.
* If you catch an error in the last minute of the class, don’t erase your entire solution; you always get part marks for those long answers.
* Check over your work as many times as possible - there is no rush to hand in your work early.