

## MCV 4U Calculus Exam Information

**Date:** Thursday, January 24<sup>th</sup>

**Material Covered:** RC1, RC2 & RC3 (Chapters 1 & 2, 5), AD1 & AD2 (Chapters 3 & 4)

**Portion of Grade:** 15.6% (52% of 30%)

### Questions to Expect:

Rate of Change (RC1, RC2 and RC3)	<ul style="list-style-type: none"> <li>• Explain average and instantaneous rates of change.</li> <li>• Use limits to determine the slope of the tangent to a curve for a given value of <math>x</math>.</li> <li>• Use properties of limits to evaluate limits as <math>x</math> approaches a given value. (2, review the techniques!)</li> <li>• Calculate a derivative from first principles.</li> <li>• Explain the meaning of <math>e^x</math> and <math>\ln x</math>, as well as how to take derivatives of these functions.</li> <li>• Prove either the power rule or the chain rule (choose one).</li> <li>• Apply derivative rules to differentiate functions (composite functions that include trigonometric functions and/or exponential functions – 4 of them)</li> </ul>
Applications of Derivatives (AD1 & AD2)	<ul style="list-style-type: none"> <li>• Solve a word problem with the equation provided.</li> <li>• Choose one of two optimization problems (3.3).</li> <li>• Choose one of two optimization problems (3.4).</li> <li>• Given a function, state asymptotes, critical values, points of inflection, intervals of increase/decrease, end behaviours, etc.</li> <li>• Two short answer questions about properties of graphs (chapter 4).</li> <li>• Sketch a graph by applying your knowledge of functions and their derivatives and the process of curve sketching.</li> </ul>

### Preparation

You will have two and a half class periods to prepare for this exam (January 21, 22, 23). If you use your class time effectively and put in a little bit of effort over the weekend prior to the exam, you should be ready as long as you apply quality study strategies. PLEASE WORK TO UNDERSTAND THE THEORY so that you select appropriate strategies to solve problems. If time continues to be an issue for you, this is likely the root cause. Specific things that you can try are:

- Reviewing and summarizing your notes, explaining the concepts in your own words. Focus on the topics that keep coming up again (cross product, applications of the dot product, forms of equations, etc.)
- Completing or copying examples from the notes, and then annotating your work explaining why we did what we did.
- Reflecting on the errors that you made on your tests. Whether they were “silly” mistakes or not, they happened. You need to identify WHY they happened so that you can learn from them!
- Redo your tests and quizzes, and again go through your solutions and explain (in writing or to a friend) WHY you did what you did.
- Try some homework questions in the areas that you weren't sure about AFTER you have studied and improved your understanding.
- Select problems from the Cumulative Review of Calculus (p. 267 – 270) that seem relevant to this outline. Remember that your text book sometimes likes to overcomplicate the review questions, so don't get too stressed out over problems you've never seen before.

- **You may fill both sides of the cheat sheet that I provide to you with whatever you'd like as long as it is in your own handwriting!**
- **I will provide you with snacks on the exam day. Please bring something to drink, and get a good night's sleep on Wednesday. Math is harder when you are tired.**
- **Extra help is available before school and according to the schedule on the white board at the front of the room.**
- **You can contact me on Thursday afternoon and I will get you your exam mark as soon as possible. I will also send you your final course mark once it is ready (probably Friday morning). Averages will be removed from Edsby following the exam.**