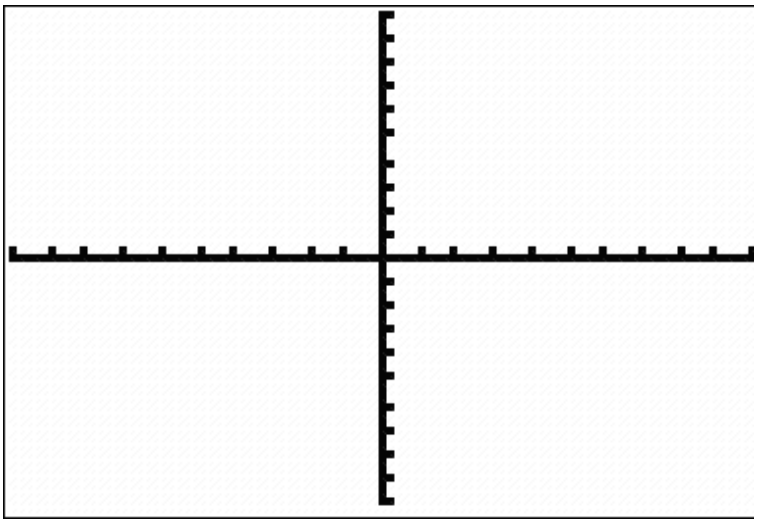
Unit 3: Day 8: Summative Task – Derivatives and Their Applications				MCV4U
Minds On: 10 Action: 45 Consolidate: 20 Total=75 min		**Assessment Goals:** • Make connections, graphically and algebraically, between the key features of a function and its first and second derivatives, and use the connections in curve sketching		**Materials** • graphing calculators • BLM.3.8.1
				Assessment Opportunities
	Minds On…	**Whole Class →Guided Discussion** Inform students that they will be completing a task in which they will demonstrate their understanding of the concepts learned in this unit Review the task and the scoring guide with the students.		
	Action!	**Individual→ Assessment Activity** Students work individually on the task by completing BLM.3.8.1.		
	Consolidate Debrief	**Whole Class →Guided Discussion** Inform the students that they will have another chance to work on a similar task to the one that they have just completed. To better prepare themselves for the next summative task, students work in groups listing what they found necessary to have success on the task. Lead a discussion of the group findings. Students write a summary, "TIPS For Success", in their journals. **Mathematical Process Focus:** Communicating, and Reflecting		
	Application	**Home Activity or Further Classroom Consolidation** Research the term "Rate of Change" and be prepared define the term, and to explain the term "Rate of Change" to a classmate. **Mathematical Process Focus:** Connecting		

3.8.1 Describe Key Features Of A Polynomial Function Given Information About Its First And Second Derivatives: Summative Task

Date: _____ **Name:** _____

1. a) Sketch and label the graph of the function $g(x)$, which is a parabola with vertex at the A(1, –2), and *x*-intercepts at the points B(0, 0) and C(2, 0).



b) If the function $g(x)$ is the derivative of $f(x)$, and $f(0) = 0$, sketch the graph of $f(x)$ on the same grid as the function $g(x)$.

c) If the equation for $g(x)$ is given as $g(x) = 2x(x-2)$, determine the equation of $f''(x)$ and describe some key features of the function $f(x)$.

d) On the same grid, sketch the graph of $f''(x)$ on the same grid as the function $g(x)$ in part **a)**.

e) Suppose *h(x)* is another function with derivative $g(x)$, where $h(0) = 3$. How would *h(x)* be different from $f(x)$ (graphically and algebraically)?

Unit 3: Jazz Day: Performance Task

MCV4U

Minds On: 5 Action: 50 Consolidate:20 Total=75 min	Assessment Goal: • Students will demonstrate their understanding of the connections between key properties of functions and the graphs of their first and second derivatives using a graphing calculator.	**Materials** • Graphing Calculators • BLM 3.J.1 & 3.J.2 • Chart paper

			Assessment Opportunities
	Minds On…	**Whole Class → Discussion** Inform students that they will be working individually on an activity that is similar to the ones they have worked on in the last few lessons. Discuss with students the rubric for assessing their work (BLM 3.J.2).	**Consider showing samples of Level 3 and 4 responses on the performance task with student names removed.**
	Action!	**Individual → Assessment Activity** Provide each student with a copy of BLM 3.J.1. Students will complete the task using a graphing calculator.. **Curriculum Expectation/Written Work/Rubric: Assess students demonstration of their learning, using a rubric (BLM3.J.2).**	
	Consolidate Debrief	**Whole Class → Class Sharing** Collect student work. In groups of 3, students write strategies and tips on chart paper they considered helpful in approaching the task.. Groups share results. The teacher records strategies and tips on chart paper and posts them in the classroom.	
	Application	**Home Activity or Further Classroom Consolidation** Use the Internet to research contexts where the knowledge of the connections in this task are applied. Provide at least one detailed example. Provide up to three areas of application of this knowledge. Submit your research tomorrow.	

3.J.1 Connecting Functions and Their Derivatives

Name: _____

Date: _____

Instructions: **Use a graphing calculator.**

THE TASK

You are given the first derivative of a function: $f'(x) = 3x^2 + 2x - 2$

- Determine and explain how you know the values of *x* for which the function $y = f(x)$:
  a) increases
  b) decreases
  c) is concave upward
  d) is concave downward

- Comment on the second derivative given your findings above.

3.J.2 Connecting Functions and Their Derivatives (Continued)

Strand: Derivatives and their Applications

Learning outcome: Students will show their knowledge of the connections between key properties of functions and the graphs of their first and second derivatives using a graphing calculator.

Performance Criteria: Making connections among mathematical concepts and procedures and integration of narrative and mathematical forms of communication across a range of media.

Performance Demonstrated	Assessment Rating
• Makes strong connections. • A variety of mathematical forms and narrative are present, integrated and well chosen.	4 Demonstrating performance beyond expectations
• Makes appropriate connections. • Both mathematical and narrative forms are present and integrated.	3 Consistent demonstration of mastery at grade level
• Makes simple connections. • Both mathematical and narrative forms are present, but the forms are not integrated.	2 Not yet consistent demonstration of mastery
• Makes weak connections. • Either mathematical or narrative form is present, but not both.	1 Beginning to work toward mastery