

Name: _____

Date: _____

K (30%)	A (30%)	T (20%)	C (20%)
/15	/15	/10	/10

MHF4U Quiz 2A: Chapter 2

Total Mark: /50

1. Label the graph and state the difference quotient. What do we use the difference quotient for?

[K – 5]

	<p>Difference Quotient:</p> <p>Use:</p>
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2. State the intervals of increase and decrease for each function.

[K – 5]

<p>Intervals:</p>	<p>Intervals:</p>

3. What does the rate of change of distance versus time represent? _____

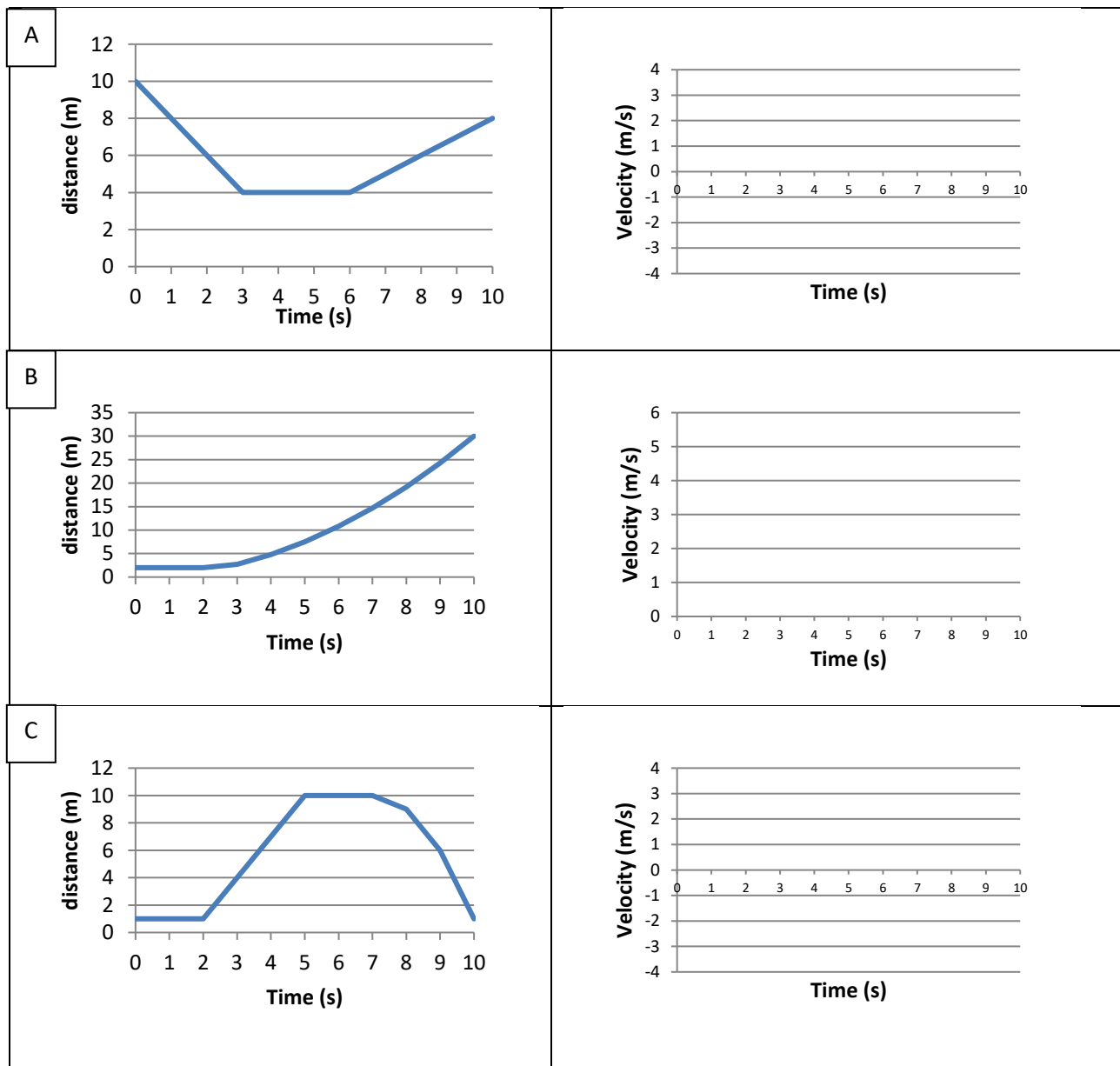
[K]

4. Determine the turning point for $f(x) = -3x^2 + 2x - 1$ and state whether it is a maximum or a minimum. How do you know?


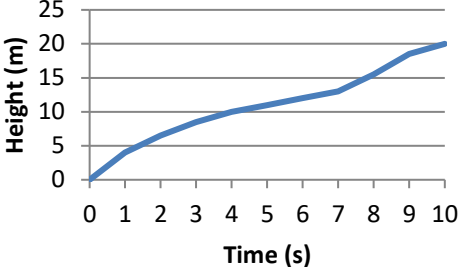

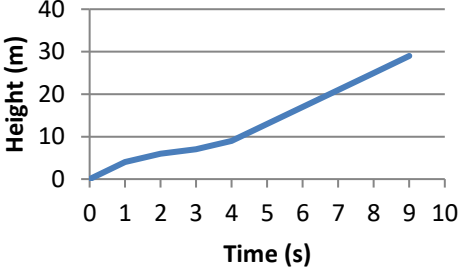

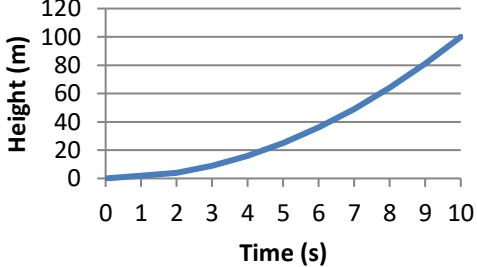

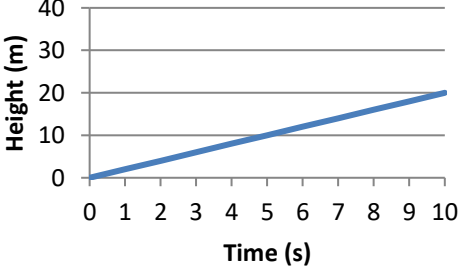

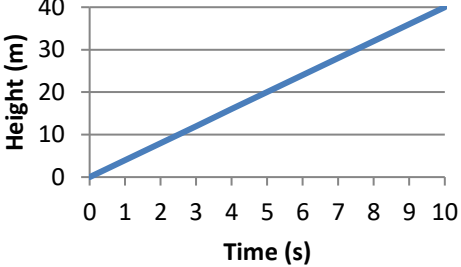
[A – 3]

5. Determine the value of a so that the average rate of change of the function $j(x) = 3x^2 + ax - 4$ over the interval $-1 \leq x \leq 2$ is 9. [K – 4]

6. Analyze each distance-time graph. Draw the corresponding velocity-time graph. [A – 3, C – 3]



7. Water is poured into each container at an equal rate. As the water fills the container, the height of the water is measured. Match each graph to the correct container shapes. [T – 5]

A		<input type="checkbox"/>	
B		<input type="checkbox"/>	
C		<input type="checkbox"/>	
D		<input type="checkbox"/>	
E		<input type="checkbox"/>	

8. Martin walks 5 m away from a motion sensor over the course of 15 s, at a constant speed. What would be the slope of the segment representing this walk on a distance versus time graph? [A – 2]

9. The value of a family's home is given by $f(x) = 130\,000(1.06)^x$, where x is the number of years after the family purchases the house for \$130 000. What is the best estimate for the instantaneous rate of change in the value of the home when the family has owned it for 6 years? [A – 3]

10. The height of an airplane above the clouds, in meters, is given by $h(t) = t^4 - 4t^3 + t^2 + 6t$, where t represents the time in hours, for $t \geq 0$. [T – 5]

a) What is the height of the airplane above the clouds at a time of 10 hours?

b) Use the concept of the IRC to prove that the airplane is at a local maximum at $t = 1$ hour.

11. The volume of a balloon is expanding. Consider the following table of data.

[A – 4, C – 2]

Time, t (s)	1	2	3	4	5	6	7	8	9
Volume, V (cm^3)	4.2	16.8	37.7	67.0	104.7	150.8	205.3	268.1	339.3

a) Use a preceding interval and a following interval separately to determine an estimate of the instantaneous rate of change at $t = 5$ s, then average your results.

b) Use the centred interval method to determine the instantaneous rate of change at $t = 5$ s.

c) What do you notice about your final answers in both parts a) and b)?

12. What is the difference between a tangent line and a secant line? Provide at least two differences.

Use course related vocabulary.

[C – 4]

13. A student is walking in a straight line in front of a motion sensor. What does he need to do to produce a horizontal segment on the distance versus time graph?

[C]