Algebra I

Equivalent Expressions and Functions

Students should be able to

- Determine if a given relation is a function.
- Evaluate and use function notation within a context.
- Write and analyze a linear or quadratic function in context.
- Determine and interpret key features of a linear or quadratic function, graphs the function, and solves problems in context.
- Determines the domain of a cube root, piece-wise step, square root, absolute value, quadratic, exponential, or linear function and relate the domain to a quantitative relationship.
- Calculates and interprets the average rate of change of linear, exponential, quadratic, square root, cube root, and piece wise functions.
- Compare rate of change associated with different intervals.

Performance Level Descriptors Covered

- Interpreting Functions: F-IF.1, F-IF.2, F-IF.4, F-IF.5,
- Rate of Change: F-IF.6.

Name_____

1. Classify each relation as a function or not a function by checking the appropriate box.

	Function	Not a Function
{(0, 1), (1, 2), (2, 3), (3, 4)}		
{(−3, 2), (−2, 4), (−1, 0)}		
Input / Output table: (−3, 3), (−3, 2), (−3, 1)		
Input / Output table: (−6, 4), (−3, 4), (−1, 4)		

Input¤	Output¤
−3¤	3¤
−3¤	2¤
−3¤	1¤

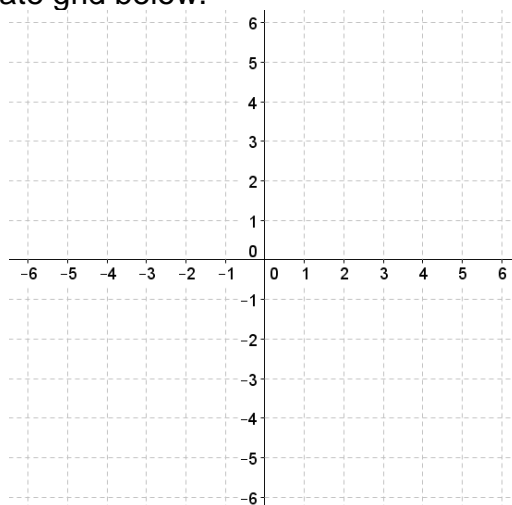| Input¤	Output¤
−6¤	4¤
−3¤	4¤
−1¤	4¤

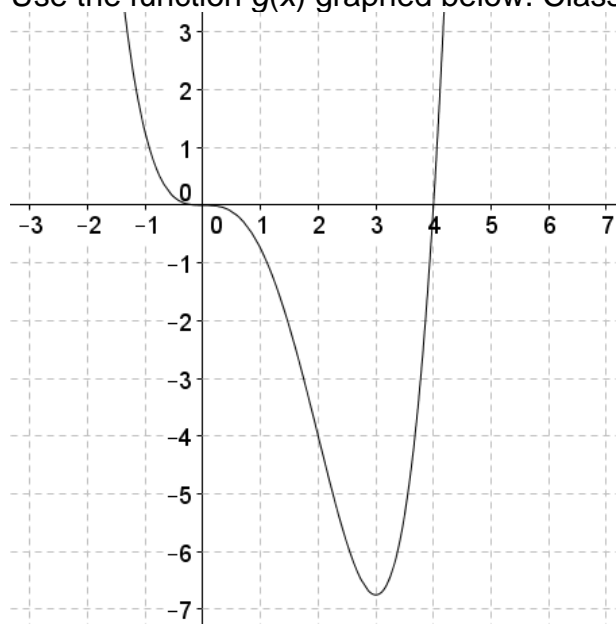2. Evaluate the function $f(x) = 3x^3 - 2x - 1$ for $f(5)$. Write your answer in the box.

$f(5) =$ ☐

3. A quadratic function has a maximum point at (2, 3) and zeros at $x = -1$ and $x = 5$. Sketch the graph on the coordinate grid below.

4. Use the function $g(x)$ graphed below. Classify each interval as increasing or decreasing.
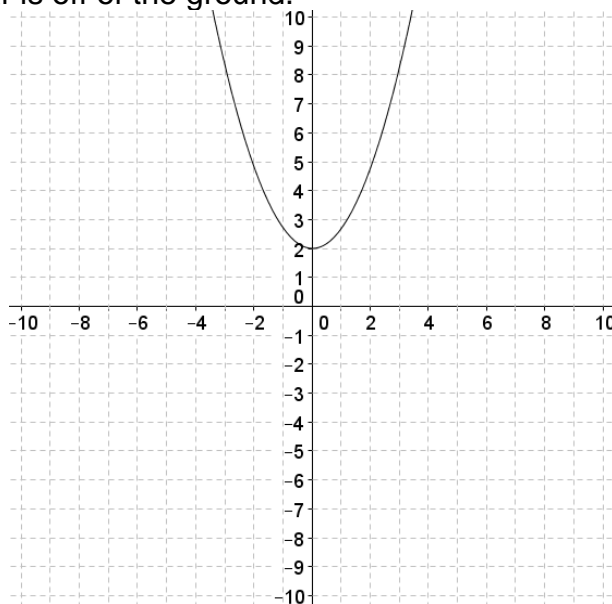

| increasing | decreasing |

$-2 \leq x \leq 0$ the function is [ ] .

$0 \leq x \leq 3$ the function is [ ] .

$3 \leq x \leq 4$ the function is [ ] .

F-IF.6

5. The graph represents the path of a roller coaster where x represents the number of seconds since the roller coaster car passed the first checkpoint and y represents the number of feet the car is off of the ground.

What is the average rate of change from when the roller coaster car passes the first checkpoint and the next 3 seconds? Write your answer in the box.
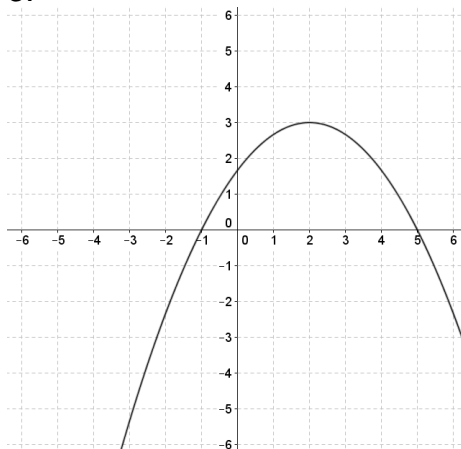
[ ] feet per second

ANSWER KEY

1.

	Function	Not a Function
{(0, 1), (1, 2), (2, 3), (3, 4)}	X	
{(−3, 2), (−2, 4), (−1, 0)}	X	
Input / Output: −3→3, −3→2, −3→1		X
Input / Output: −6→4, −3→4, −1→4	X	

Input¤	Output¤
−3¤	3¤
−3¤	2¤
−3¤	1¤

Input¤	Output¤
−6¤	4¤
−3¤	4¤
−1¤	4¤

2. 364

3.

4. −2 ≤ x ≤ 0 the function is   decreasing   .

   0 ≤ x ≤ 3 the function is   decreasing   .

   3 ≤ x ≤ 4 the function is   increasing

5. 2