Topic: IM2 – 3.2 (N – 1) Average Rate of Change	Standard(s): F.IF.6	Notes

Essential Question: How can I calculate and interpret the average rate of change for quadratic functions?

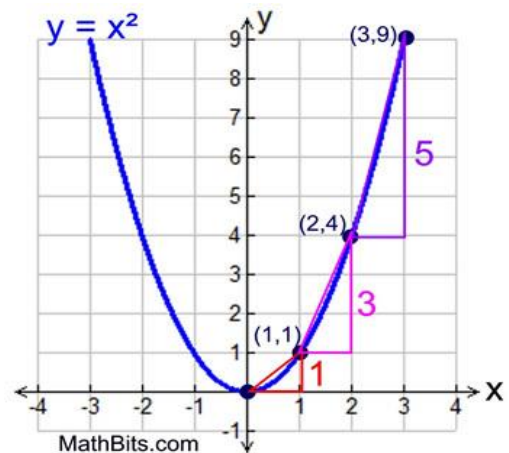| Questions / Big Ideas	Key Terms
	Average Rate of Change (ARoC) $\equiv$ the slope of the segment connecting two points. • The average rate of change (slope) will NOT be constant for quadratic functions. • It will change based upon the location of two chosen points. Slope Formula • $\dfrac{\Delta y}{\Delta x} = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{Change\ in\ y}{Change\ in\ x} = \dfrac{Rise\ (Vertical)}{Run\ (Horizontal)}$ ARoC of a Quadratic Parent Function / Equation

Chosen Points	Average Rate of Change $\dfrac{\Delta y}{\Delta x}$
1. (x_1, y_1) 2. (x_2, y_2)	
(0,0) and (1,1)	$\dfrac{1}{1} = 1$
(1,1) and (2,4)	$\dfrac{3}{1} = 3$
(2,4) and (3,9)	$\dfrac{5}{1} = 5$

Guided Practice

• Calculate the average rate of change for the points (1, 1) and (3, 9):

Average Rate of Change $= \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{\quad - \quad}{\quad - \quad} = \dfrac{\quad\quad}{\quad\quad} =$

Questions / Big Ideas	Interpreting the Average Rate of Change (in Context)

	1. Read and reread your scenario. Underline important information about the who, what, where, when, and why.
	
	2. Determine the independent & dependent quantities and their units of measure.
	
	3. Determine the RATE of the dependent quantity in terms of the independent quantity: y per x.
	
	    a. Ex. 6 miles per hour
	    b. Ex. 2 cars for every 3 teenagers
	
	4. Write a complete, stand-alone sentence that includes all of the information above (steps 1 & 2).
	
	    a. Ex. Kylie walks 6 miles per hour to her friend's house after school.
	    b. Ex. In the state of Vermont, the average number of cars per teenagers in a household is 2 to 3.
	
	Guided Practice
	
	• The number of mosquitos, M(x), in Miami, Florida (in millions of mosquitos) as a function of rainfall, x, (in centimeters) is modeled by the function: $M(x) = -x^2 + 17x$. With only 1 inch of rain, there are 16 million mosquitos. With 8 inches of rainfall, there are 72 million mosquitos. Find the average rate of change between the two values.
	
	Average Rate of Change = $\dfrac{y_2 - y_1}{x_2 - x_1}$ = $\dfrac{-}{-}$ = $\underline{\quad\quad}$ =
	
	Interpret the average rate of change in a complete sentence: _____
	
	_____
	
	_____

Summary: _____

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