IM2 – 3.2 (P – cV1) Key Characteristics in Context – Individual Practice

F.IF.4, F.IF.5, F.IF.6

Name: _____ Per: _____ Date: _____

Directions - *Answer each of the following questions with the context, above it, in mind:*

Context: Woofy Wearables, Inc. makes dog-themed earrings. Their monthly profit (in hundreds of dollars), W(x), as a function of the price, x, of a pair of earrings (in dollars) is modeled by: $P(x) = -2x^2 + 36x - 90$

1. Make a clear sketch of the graph, below. Label the quantities (with measurement) for each axis, as well as intervals, intercepts, and the vertex. Write neatly!

2. Fill in the table of values below:

x	P(x)
3	
4	
5	
8	
9	
12	
13	
15	

3. Use inequality notation to describe the domain:

4. Use inequality notation to describe the:

   Interval of increase: *Interval of decrease:*

5. Which price(s) for each pair of earrings sold will result in no profit?

6. Which price(s) of earrings will generate a profit of $5,400?

7. Which price(s) of earrings will result in the maximum profit for Woofy Wearables, Inc.?

8. What is the annual profit for earrings priced at $14.50?

9. What is the average rate of change, in hundreds of dollars, for earrings priced from $3 to $6?

10. What is the average rate of change, in hundreds of dollars, for earrings priced from $9 to $13?

Context: From 60 feet in the air, a seagull spots a fish. It dives into the water & catches the fish. Then, it flies up to a telephone pole 18 feet above the water's surface to enjoy its breakfast. The seagull's dive, *S(x)*, (in feet relative to sea level), x seconds after diving, is modeled by: $S(x) = \frac{3}{4}x^2 - 14x + 60$

1. Make a clear sketch of the graph, below. Label the quantities (with measurement) for each axis, as well as intervals, intercepts, and the vertex. Write neatly!	**2.** Fill in the table of values below:

2. Fill in the table of values below:

x	S(x)
1	
4	
6	
10	
12	
14	
0	
	0
	0

3. Use inequality notation to describe the domain:

4. Use inequality notation to describe the:
   Interval of increase: *Interval of decrease:*

5. After how many seconds is the seagull at sea level?

6. What is the deepest that the seagull dives into the ocean?

7. The seagull lands on the telephone pole to eat its breakfast after how many seconds?

8. What is the height of the seagull at 11 seconds into the dive?

9. What is the average rate of change, in feet, when the seagull has been diving from 1 to 6 seconds?

10. What is the average rate of change, in feet, when the seagull has been diving from 10 to 14 seconds?