

# IM2 – 3.2 (P – cV4) 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:** Carlos threw a large cardboard airplane across the park. The height of the plane (in feet),  $b(x)$ , as a function of time,  $x$ , (in seconds) is modeled by:  $b(x) = -0.04x^2 + 1.2x + 7$

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	b(x)
0	
5	
13	
15	
17	
18	
20	
30	
35	

3. Use inequality notation to describe the domain:

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

5. After 8 seconds, how high up was the airplane?

6. How much time has passed when the airplane is 12 feet up in the air?

7. When will the airplane be at its maximum height?

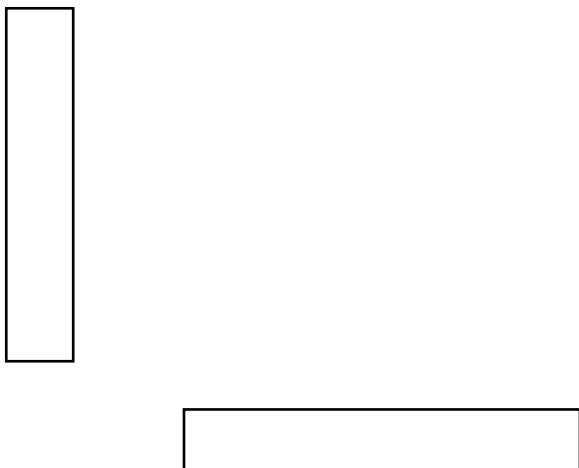
8. What is the height of the airplane 30 seconds after Carlos throws it?

9. What is the average rate of change, for the height of the airplane, from 13 to 17 seconds? Interpret (write a complete sentence).

10. What is the average rate of change, for the height of the airplane, between 5 and 30 seconds? Interpret (write a complete sentence).

**Context:** From 18 feet in the air, a pelican spots a fish. It dives into the ocean & catches the fish. Then, it flies up to a pier 8 feet above the water's surface to enjoy its dinner. The height of the pelican as it dives,  $P(x)$ , (in feet relative to sea level),  $x$  seconds after diving, is modeled by:  $P(x) = 0.5x^2 - 6.2x + 18$

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)
0	
1	
4	
5	
6	
8	
9	
10	

3. Use inequality notation to describe the domain:

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

5. After catching the fish, when does the pelican exit the water?

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

7. The pelican lands on the pier to eat its dinner after how many seconds?

8. What is the height / depth of the pelican at 7 seconds into the dive?

9. What is the average rate of change, in feet, when the pelican has been diving from 2 to 7 seconds? Interpret (write a complete sentence).

10. What is the average rate of change, in feet, when the pelican has been diving from 5 to 10 seconds? Interpret (write a complete sentence).