Select the appropriate model for the data (linear/quadratic/cubic). Explain why it models the data.

1.

x	1	2	3	4	5	6
y	1	-4	-15	-32	-55	-84

2.

x	2	4	6	8	10	12
y	-13	-8	-3	2	7	12

3.

x	0	1	2	3	4	5
y	5	3	11	35	81	155

4.

x	2	4	5	6	7	8
y	5	-7	-16	-27	-40	-55

CALCULATOR ACTIVE. Use the model to answer the questions in context.

5. A diver jumps from a cliff into the water below. The function $h(t) = -16t^2 + 12t + 120$ models the height of the diver over time, where t is time in seconds and h is the height in feet.

   a. Find $h(2)$. Explain your solution in context.

   b. What is the average rate of change from $t = 1$ to $t = 2$? Explain your solution in context.

   c. What is the maximum height of the diver?

   d. What is the restricted domain in this context?
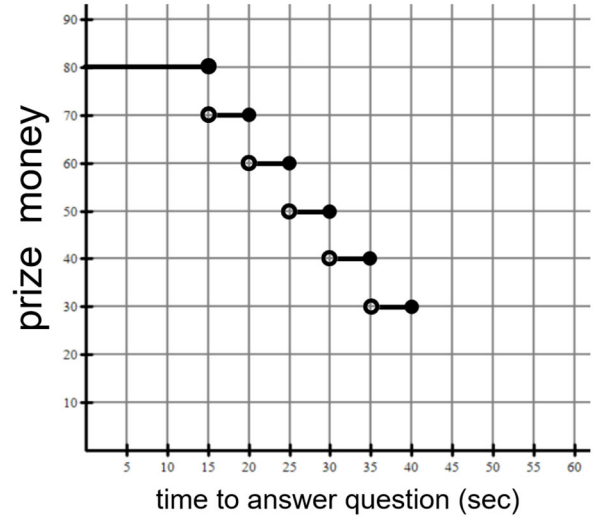
   e. What is the restricted range in this context?

6. A radio station is having a contest. The money won by listeners depends on how long it takes them to correctly answer the question.

a. What is the domain in this context?

b. What is the range in this context?

c. Find $f(30)$. What does it mean in this context?

Answers to 1.13 CA #1

1. Quadratic, second difference of -6	2. Linear, first difference of $\frac{5}{2}$
3. Cubic, third difference of 6	4. Quadratic, second difference of -8

5.
 	
  a. $h(2) = 80$
     In 2 seconds the height of the diver is 80 ft
 	
  b. -36 feet per second
 	
  c. 122.25 feet
 	
  d. Domain: $[0, 3.139]$
 	
  e. Range: $[0, 122.25]$
	6.
	
	  a. Domain: $[0, 40]$
	
	  b. Ramge: $\{80, 70, 60, 50, 40, 30\}$
	
	  c. $f(30) = 50$
	     If it takes the listener 30 seconds to answer the question, they get $50