

Name _____ Period _____ Date _____

Frogs and Fleas Unit Test

For full credit show all your thinking. No calculators.

1. These five tables display various patterns of change.

Table 1

x	y
1	2
2	4
3	6
4	8
5	10
6	12
7	14

Table 2

x	y
1	1
2	4
3	9
4	16
5	25
6	36
7	49

Table 3

x	y
1	0
2	4
3	18
4	48
5	100
6	180
7	294

Table 4

x	y
1	4
2	10
3	18
4	28
5	40
6	54
7	70

Table 5

x	y
1	3
2	4
3	5
4	6
5	7
6	8
7	9

a. Which of the tables show a linear relationship?

b. How do you know which tables show a linear relationship?

c. Which of the tables show a quadratic relationship?

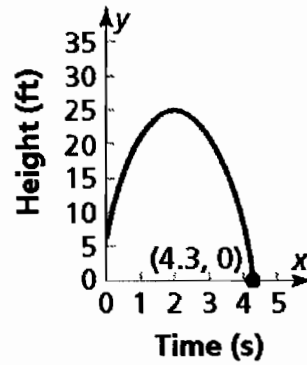
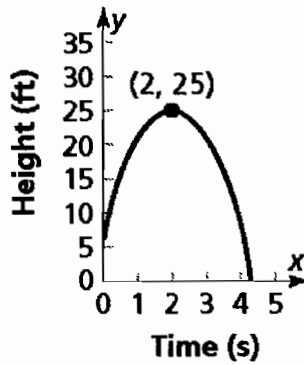
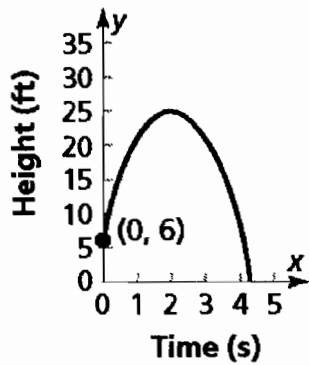
d. How do you know which tables show a quadratic relationship?

e. Write an equation for one of the tables that represents a linear relationship.

f. Write an equation for one of the tables that represents a quadratic relationship. _____

2. The graphs below represent how the height of an emergency flare fired from a boat changes over time. A point is marked on each graph. Explain what the coordinates reveal about the flare.

Height of a Flare



(0 , 6) -

(2 , 25) -

(4.3 , 0) -

3. The following equation represents the depth, ***D*** of an anchor tossed from a boat after ***t*** seconds. $D = -5t^2 + 30t$
- If it takes 10 seconds for the anchor to reach the bottom, how deep is the water?
 - How long would it take the anchor to reach the bottom if the water is 35 feet deep?

Factor each of the following expressions completely.

4. $9x^2 - 25$

6. $x^2 + 7x - 18$

5. $x^2 - 5x - 36$

7. $3x^2 - 30x + 75$

For the following tables, fill in the missing y-values. Explain what type of relationship is represented, and show how you were able to calculate the missing values.

8.

x	0	1	2	3	4	5	6
y	1	3	9	27	81		

9.

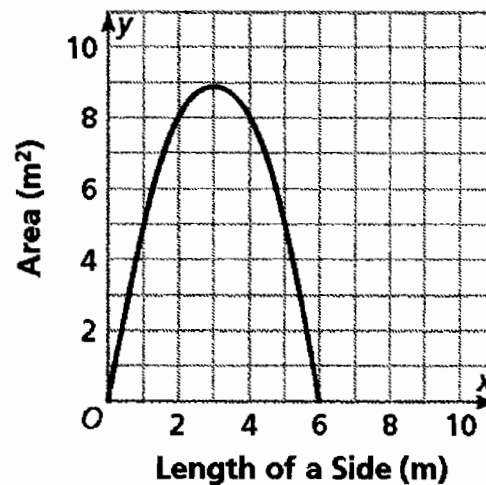
x	-1	0	1	2	3	4	5
y	-5	0	3	4	3		

10. The graph to the right shows length and area data for rectangles with a fixed perimeter.

a. What are the dimensions of the rectangle with this perimeter and an area of 5 square meters?

b. What is the fixed perimeter for the rectangle described by the graph? Explain how you know.

Areas of Rectangles with Fixed Perimeter



c. What is the greatest area possible for a rectangle with this perimeter? What are the dimensions of this rectangle?

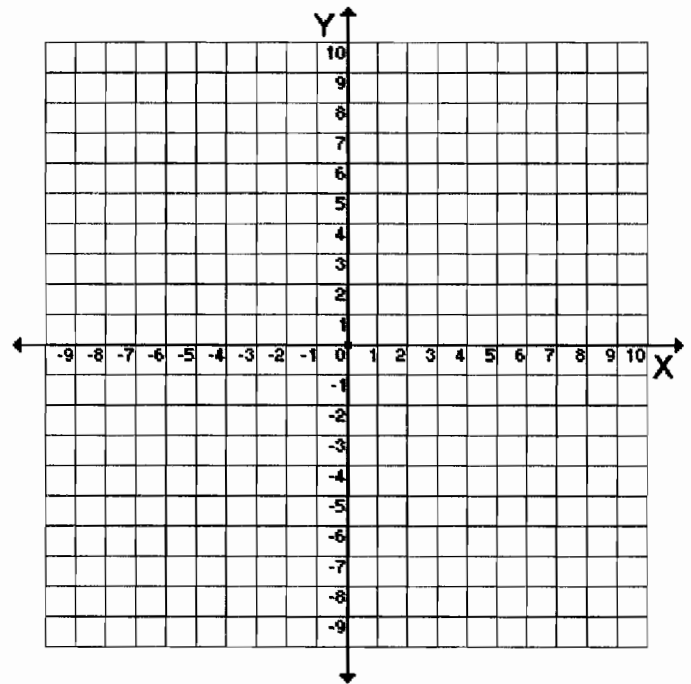
11. Find the important features for the parabola represented by the equation below, and graph it. Explain how you determined each feature.

$$y = x^2 - 2x - 3$$

Opens up/down:

y-intercept:

x-intercepts:



Line of Symmetry:

Vertex: