STEP 2   Write a quadratic function in standard form: $ax^2 + bx + c$.

$f(x) = 2x^2 + 3x + 1$

YOU TRY IT! #3

For the data set below, write a function relating the variables.

x	y
1	1
2	9
3	23
4	43
5	69

PRACTICE/HOMEWORK

For questions 1 – 8, use finite differences and mental math, as appropriate, to determine if the data sets shown in the tables below represent a linear, exponential, quadratic, or other type of function.

1.
x	$y = f(x)$
1	5
2	11
3	21
4	35
5	53

2.
x	$y = f(x)$
1	5
2	11
3	17
4	23
5	29

3.
x	$y = f(x)$
1	5
2	9
3	16
4	29
5	52

4.
x	$y = f(x)$
1	5
2	14
3	29
4	50
5	77

5.
x	$y = f(x)$
1	5
2	12
3	31
4	68
5	129

6.
x	$y = f(x)$
1	5
2	8
3	13
4	20
5	29

7.

x	y = f(x)
1	5
2	11
3	24
4	53
5	117

8.

x	y = f(x)
1	5
2	9
3	13
4	17
5	21

For questions 9 – 12, the data sets shown in the tables represent quadratic functions. Use finite differences to determine the values of a, b, and c and then write the function in standard form.

9.

x	y = f(x)
0	7
1	10
2	19
3	34

10.

x	y = f(x)
0	3
1	6
2	13
3	24

11.

x	y = f(x)
0	–1
1	5
2	19
3	41

12.

x	y = f(x)
0	–6
1	–1
2	14
3	39

For questions 13 – 16, the data sets shown in the tables represent quadratic functions. Use finite differences to determine f(0), the values of a, b, and c and then write the function in standard form.

13.

x	y = f(x)
0	?
1	–1
2	5
3	13
4	23

14.

x	y = f(x)
0	?
1	3
2	16
3	41
4	78

15.

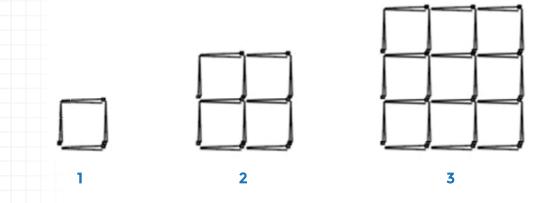| x	$y = f(x)$
0	?
1	-9
2	-8
3	-1
4	12

16.

x	$y = f(x)$
0	?
1	7
2	22
3	45
4	76

For questions 17 – 20 use the situation below.

CRITICAL THINKING

Toothpicks were used to create the pattern below.

1   **2**   **3**

17. Relate the length of one side of the figure, x, to the area of the figure, y, by completing the table below. The first row has been completed for you.

LENGTH x	AREA y
1	1
2	
3	

18. Write the function relating the variables in problem 17.

19. If the pattern continues, what would be the area of a figure with a side length of 7?

20. Relate the figure number, x, to the total number of toothpicks needed to create the figure, y, by completing the table below. The first row has been completed for you.

FIGURE NUMBER x	TOTAL TOOTHPICKS y
1	4
2	
3	

21. Write the function relating the variables in problem 20.

22. If the pattern continues, how many toothpicks would be needed to create Figure 5?

For questions 23 – 24 use the situation below.

SCIENCE

GRAVITY EXPERIMENT

An experiment is conducted by dropping an object from a height of 150 feet and measuring the distance it has fallen at 1-second intervals. Identical objects were used to perform the experiment on Venus, Earth, and Mars. The tables below show the results of each experiment.

VENUS	
TIME (SEC) x	DISTANCE (FEET) y
0	0
1	14.8
2	59.2
3	133.2

EARTH	
TIME (SEC) x	DISTANCE (FEET) y
0	0
1	16
2	64
3	144

MARS	
TIME (SEC) x	DISTANCE (FEET) y
0	0
1	6.2
2	24.8
3	55.8

23. Determine if each table represents a linear, exponential, or quadratic function.
Venus: Earth: Mars:

24. Write a function relating the variables in each of the tables above.
Venus:
Earth:
Mars: