Lesson 3

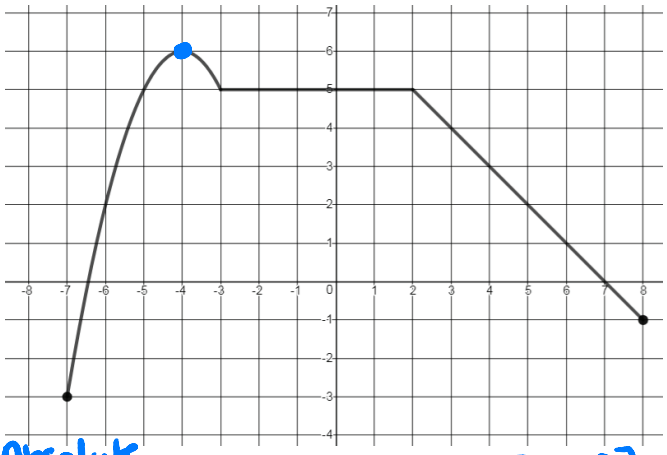
READY, SET, GO! Name Key Period Date

READY

Topic: Key Features.

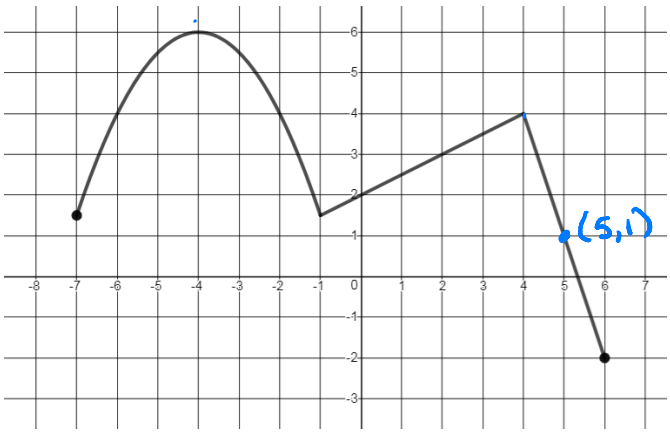
Identify the key features of the functions below.

1.



Absolute Maximum: 6
Absolute Minimum: 3
Domain: [-7, 8]
Range: [-3, 6]
Increasing Interval(s): (-7, -4)
Decreasing Interval(s): (2, 8)
Y-intercept: (0, 5)
X-intercept(s): (7, 0) ≈(-6.5, 0)

2.



Absolute Maximum: 6
Absolute Minimum: -2
Domain: [-7, 6]
Range: [-2, 6]
Increasing Interval(s): (-7, -4) ∪ (-1, 4)
Decreasing Interval(s): (-4, -1) ∪ (4, 6)
Y-intercept: (0, 2)
X-intercept(s): (5 1/3, 0)

SET

Topic: Distinguishing between linear and quadratic patterns

Use first and second differences to identify the pattern in the tables as *linear, quadratic,* or *neither*. Write the recursive equation for the patterns that are linear or quadratic.

3.

x	y	1st diff. (linear, constant)
-3	-23	
-2	-17	+6
-1	-11	+6
0	-5	+6
1	1	+6
2	7	+6
3	13	

a. Pattern: Linear

b. Recursive equation: $\begin{cases} f(x) = f(x-1) + 6 \\ f(-3) = -23 \end{cases}$

4.

x	y	1st diff (linear)	2nd diff (constant)
-3	4		
-2	0	-4	+2
-1	-2	-2	+2
0	-2	+0	+2
1	0	+2	+2
2	4	+4	+2
3	10	+6	+2

Quad.

a. Pattern: Quadratic

b. Recursive equation: $\begin{cases} f(x) = f(x-1) + 2x \\ f(-3) = 4 \end{cases}$

5.

x	y	1st diff (linear, constant)
-3	-15	
-2	-10	+5
-1	-5	+5
0	0	+5
1	5	+5
2	10	+5
3	15	+5

a. Pattern: Linear

b. Recursive equation: $f(x) = f(x-1) + 5$; $f(-3) = -15$

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6.

x	y	
-3	24	
-2	22	-2
-1	20	-2
0	18	-2
1	16	-2
2	14	-2
3	12	-2

a. Pattern: Linear

b. Recursive equation:

$f(x) = f(x-1) - 2$
$f(-3) = 24$

7.

x	y	1st diff	2nd diff
-3	48		+10
-2	22	-26	+10
-1	6	-16	+10
0	0	-6	+10
1	4	+4	+10
2	18	+14	+10
3	42	+24	

Quadratic

a. Pattern: Quadratic

b. Recursive equation:

$f(x) = f(x-1) + 10 \times -6$
$f(-3) = 48$

8.

x	y	1st diff	2nd diff
-3	4		
-2	1	-3	
-1	0	-1	+2
0	1	+1	+2
1	4	+3	+2
2	9	+5	+2
3	16	+7	+2

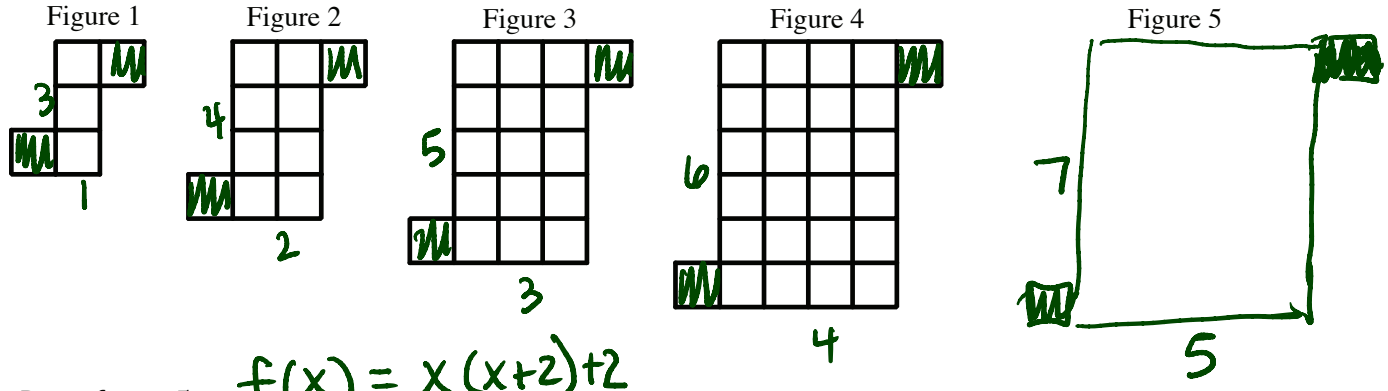
Quadratic linear Constant

a. Pattern: Quadratic

b. Recursive equation:

$f(x) = f(x-1) + 2 \times +1$
$f(-3) = 4$

9.



a. Draw figure 5.

$f(x) = x(x+2)+2$

b. Predict the number of squares in figure 30. Show what you did to get your prediction.

$f(30) = 30(32) + 2 = 962$

GO

Topic: Interpreting recursive equations to write a sequence

Write the first five terms of the sequence.

10. $f(0) = -5; f(n) = f(n-1) + 8$

-5, 3, 11, 19, 27, 35

11. $f(0) = 24; f(n) = f(n-1) - 5$

24, 19, 14, 9, 4, -1

12. $f(0) = 25; f(n) = 3f(n-1)$

25, 125, 375, 1125, 3375, 10125

13. $f(0) = 6; f(n) = 2f(n-1)$

6, 12, 24, 48, 96, 192