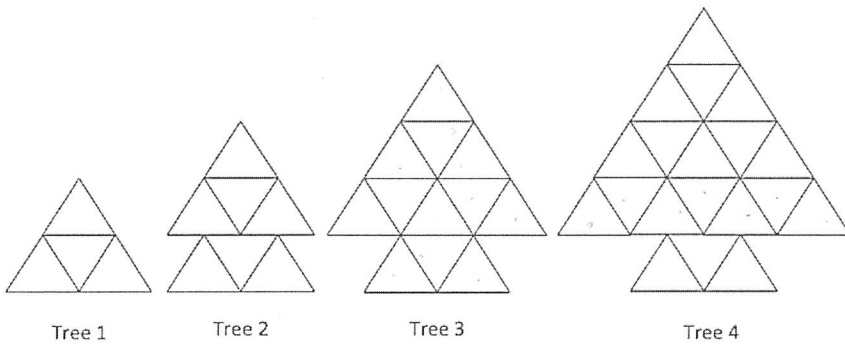


Key

# Module 9 Review



1. Make a table for the pattern.

x	y	1st	2nd
0	3	-1	
1	4	1	2
2	7	3	2
3	12	5	2
4	19	7	2

2. What type of pattern is represented?

quadratic

3. Find a recursive function for the pattern.

$$f(x) = f(x-1) + 2x - 1, f(1) = 4$$

4. What is an explicit function for the pattern?

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

$$4 = 1(1)^2 + b(1) + 3$$

$$b = 0$$

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

5. How many tiles does the 55<sup>th</sup> Tree have?

$$f(55) = 55^2 + 3$$

$$f(55) = 3028$$

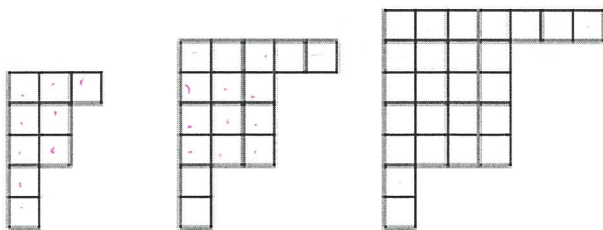


Figure 1

Figure 2

Figure 3

6. Make a table for the pattern above.

x	y	1 <sup>st</sup>	2 <sup>nd</sup>
0	4	3	
1	9	5	2
2	16	7	2
3	25	9	2

7. What type of pattern is represented?

quadratic

8. Find a recursive function for the pattern.

$$f(x) = f(x-1) + 2x + 3, f(1) = 9$$

9. What is an explicit function for the pattern?

$$f(x) = 1x^2 + bx + 4$$

$$9 = 1^2 + b(1) + 4$$

$$4 = b$$

$$f(x) = x^2 + 4x + 4$$

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

10. Figure  $n$  has 441 tiles. Determine the value of  $n$ .

Bonus →

$$f(n) = 441 = x^2 + 4x + 4$$

$$441 = n^2 + 4n + 4$$

$$0 = n^2 + 4n - 437$$

$$0 = n^2 + 23n - 19n - 437$$

$$0 = (n+23)(n-19)$$

$$n = -23$$

$$n = 19$$

11. Simplify each of the following expressions:

a.  $(3x + 7) + (4x - 9)$   $7x - 2$

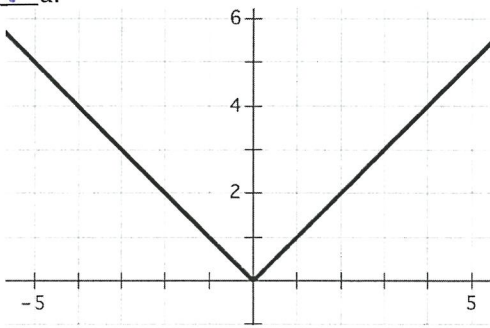
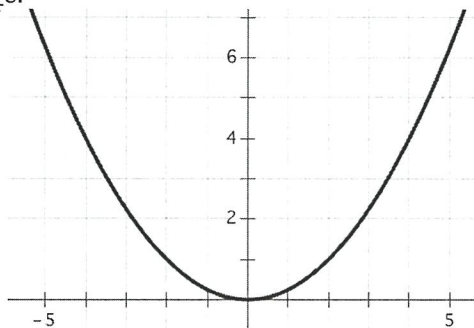
b.  $(x - 3y)(x + 3y)$   $x^2 - 9y^2$

c.  $(2x - 5)(x + 5)$   $2x^2 + 5x - 25$

d.  $4(x - 2y)(3x + 1y)$

$4(3x^2 - 6xy + xy - 2y^2) = 12x^2 - 20xy - 8y^2$   
 L E Q N

12. Identify each of the following representations as linear, exponential, quadratic, or neither.

<p><u>E</u> a. <math>f(x) = 2^x + 5</math></p>	<p><u>Q</u> b. <math>f(x) = x^2 + 5</math></p>	<p><u>L</u> c. <math>f(x) = 2x + 5</math></p>																							
<p><u>N</u> d.</p> 	<p><u>Q</u> e.</p> 																								
<p><u>E</u> f.</p> <table border="1" data-bbox="365 1207 625 1417"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>-2</td> <td>1/25</td> </tr> <tr> <td>-1</td> <td>1/5</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>5</td> </tr> <tr> <td>2</td> <td>25</td> </tr> </tbody> </table>	x	y	-2	1/25	-1	1/5	0	1	1	5	2	25	<p><u>Q</u> g.</p> <table border="1" data-bbox="917 1207 1242 1417"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>-2</td> <td>9</td> </tr> <tr> <td>-1</td> <td>6</td> </tr> <tr> <td>0</td> <td>5</td> </tr> <tr> <td>1</td> <td>6</td> </tr> <tr> <td>2</td> <td>9</td> </tr> </tbody> </table> <p style="margin-left: 150px;"><math>\begin{array}{r} -3 \\ -1 \\ 2 \end{array} \Bigg  \begin{array}{l} 2 \\ 2 \\ 2 \end{array}</math></p>	x	y	-2	9	-1	6	0	5	1	6	2	9
x	y																								
-2	1/25																								
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<p><u>L</u> h. <math>f(0) = 5</math> <math>f(x) = f(x - 1) + 3</math></p>	<p><u>E</u> i. <math>f(0) = 5</math> <math>f(x) = f(x + 1) \cdot 7</math></p>	<p><u>Q</u> j. <math>f(0) = 5</math> <math>f(x) = f(x - 1) + x</math></p>																							

# Find equations as well!

## Problems

L Q E

Based on the difference in y-values, identify the graph as linear, quadratic, exponential, or neither. **N**

1. **Linear**  $y = -4x + 2$

x	-3	-2	-1	0	1	2	3
y	14	10	6	2	-2	-6	-10

2. **Exponential**  $y = 4 \cdot 2^x$

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{2}$	1	2	4	8	16	32

3. **Quadratic**  $y = x^2 - 4x$

x	-3	-2	-1	0	1	2	3
y	21	12	5	0	-3	-4	-3

4. **Linear**  $y = 3x - 7$

x	-3	-2	-1	0	1	2	3
y	-16	-13	-10	-7	-4	-1	2

5. **Linear**  $y = 5x + 1$

x	-3	-2	-1	0	1	2	3
y	-14	-9	-4	1	6	11	16

6. ~~Quadratic~~ **Neither**

x	-3	-2	-1	0	1	2	3
y	-18	-6	-2	0	2	6	18

7. **Exponential**  $y = 32 \cdot 2^x$

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

8. **Exponential**  $y = 1 \cdot 3^x$

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27

9. **Quadratic**  $y = x^2 - 5x + 6$

x	-3	-2	-1	0	1	2	3
y	30	20	12	6	2	0	0

10. **Linear**  $y = -2x + 5$

x	-3	-2	-1	0	1	2	3
y	11	9	7	5	3	1	-1

11. **Exponential**  $y = 3 \cdot 3^x$

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27	81

12. **Neither**

x	-3	-2	-1	0	1	2	3
y	-27	-9	-3	0	3	9	27

13. **Quadratic**  $y = -x^2 + 9$

x	-3	-2	-1	0	1	2	3
y	0	5	8	9	8	5	0

14. **Quadratic**  $y = x^2 + 2x$

x	-3	-2	-1	0	1	2	3
y	3	0	-1	0	3	8	15

15. **Neither**

x	-3	-2	-1	0	1	2	3
y	1	0	-1	-2	-1	0	1

16. **Exponential**  $y = 9 \cdot 2^x$

x	-3	-2	-1	0	1	2	3
y	$\frac{9}{8}$	$\frac{9}{4}$	$\frac{9}{2}$	9	18	36	72