1. **REVIEW** What are key characteristics of linear, quadratic, and exponential functions?

2. What rule describes the family of exponential functions?

3. What is the quadratic parent function?

4. Compare the rates of change of linear, quadratic, and exponential functions.

x	$y = f(x) = x$
-4	-4
-3	-3
-2	-2
-1	-1
0	0

(1, 1, 1, 1)

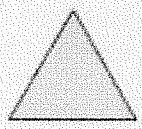
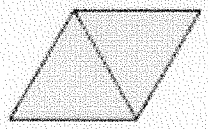
x	$y = g(x) = 2^x$
-4	0.0625
-3	0.125
-2	0.25
-1	0.5
0	1

(1, 1, 1, 1) (0.0625, 0.125, 0.25, 0.5)

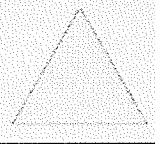
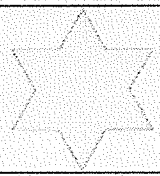
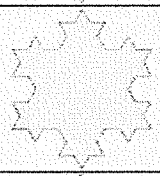
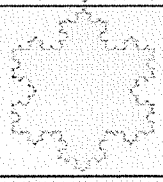
x	$y = h(x) = x^2$
-2	4
-1	1
0	0
1	1
2	4

(1, 1, 1, 1) (-3, -1, 1, 3) (2, 2, 2)

5. Complete the table. Join a congruent equilateral triangle to each previous figure so that the new triangle shares exactly one side with one of the old triangles. Then find the perimeter of the new figure.

Figure number	Visual depiction	Perimeter
1		
2		
3		
4		

6. Complete the table. To make each new figure in the sequence, each side of the previous figure was divided into thirds and a new equilateral triangle was drawn on the middle third of each side.

Figure number	Visual depiction	Perimeter
1		
2		
3		
4		

7. Which of the function families you studied in Algebra I grows like an arithmetic sequence? Why?

8. Which of the function families you studied in Algebra I grows like a geometric sequence? Why?

9. **REINFORCE** In this topic, you will continue to study arithmetic and geometric sequences. Before you go further, capture your understanding so far of each type of sequence. Complete this table. State the ideas in your own words and provide your own examples, but also try to incorporate mathematical terms like **common difference** and **common ratio.**

Vocabulary term	My understanding of what the term means	An example that illustrates the term
Arithmetic sequence		
Geometric sequence		

10. **REINFORCE** Identify each pattern as an arithmetic sequence, geometric sequence, or neither type of sequence. Give evidence for your conclusion.

a. 13, 20, 27, 34, ...

b. 14, 21, 42, 77, ...

c. 16, 64, 256, 1024, ...

d. $\frac{1}{3}, \frac{2}{9}, \frac{4}{27}, \frac{8}{81}, \frac{16}{243}, \ldots$

e. 10, 9.99, 9.98, 9.97, ...