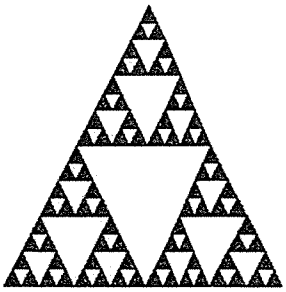
Student:_____Class:_____Date_____

Understanding inverse relations

Student Activity Sheet 3; *Exploring* "The exponential function and its inverse"

1. Describe how the Sierpinski Triangle is an example of a ***fractal.***



2. The table shows the number of upward triangles for various iterations of the Sierpinski Triangle. What pattern do you notice in the number of upward triangles?

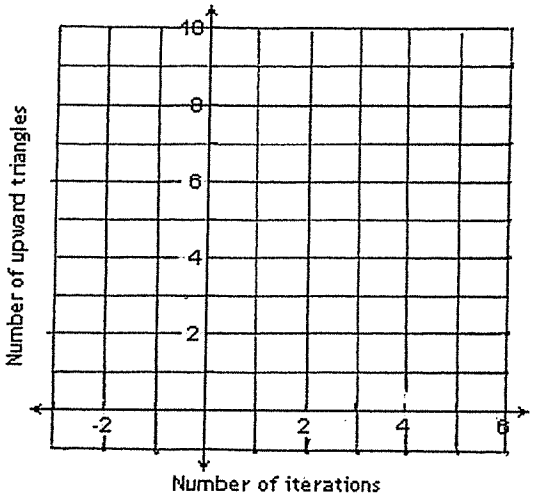
Number of iterations	Visual description	Written description	Process	Upward triangles
0		1 upward triangle	$3^0 = 1$	1
1		3 upward triangles	$3^1 = 3$	3
2		9 upward triangles	$3^2 = 9$	9
3		27 upward triangles	$3^3 = 27$	27

3. What type of function could model the data in the table above?

4. Complete the table to find a function rule that models the relationship between the number of upward triangles and the number of iterations.

Number of iterations	Written description	Process	Upward triangles
4			
5			
n			

5. Graph the function rule that represents the upward triangles in the Sierpinski Triangle.



6. How do the domain and range of the function rule compare to the domain and range of the problem situation?

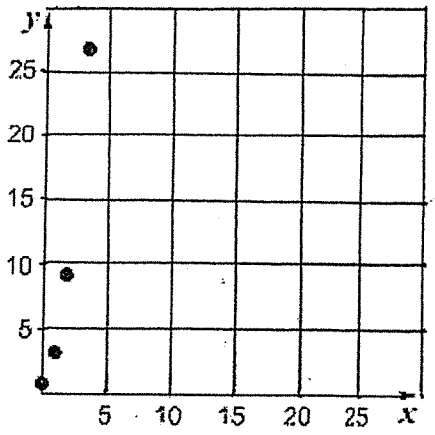
7. How many upward triangles are in the 10th iteration of the Sierpinski Triangle?

8. Which iteration of the Sierpinski Triangle has 531,441 upward triangles?

9. Complete the table to show the inverse of $y = 3^x$. Then complete the scatterplot for the inverse.

x	$y = 3^x$
0	1
1	3
2	9
3	27

$x = 3^y$	y



10. What type of function models this inverse?