

Powers of Four – Link Sheet

Verbal

Minerva was wondering how she could explain “powers of 4” to her math partner. She decided to make a table of values to show the powers of 4.

Graphical

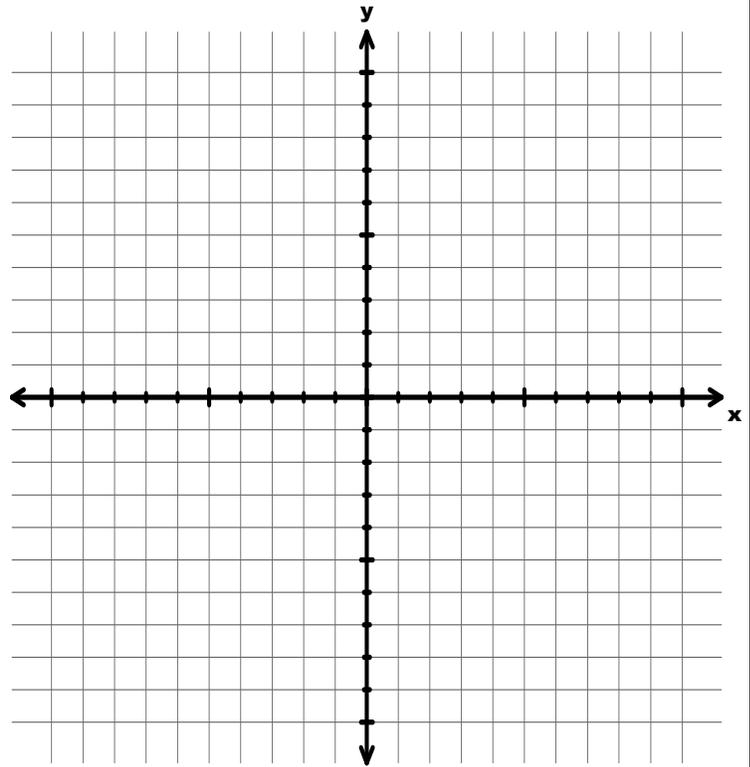


Table of Values

Power of 4	Expanded Form	Alternate Way of Showing	Standard Form
4^{-4}	$1 \div 4 \div 4 \div 4 \div 4$	$\frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4}$	
4^{-3}	$1 \div 4 \div 4 \div 4$		
4^{-2}			
4^{-1}			
4^0			
4^1			
	$4 \cdot 4$		
			64
	$4 \cdot 4 \cdot 4 \cdot 4$		
4^5			

Analysis

1. What is the value of 4^0 ?
2. Describe what you are actually doing when you find 4^{-3} ? Is there ANOTHER WAY to describe this?

3. Graph your table of values, using “Power of 4” as the x-axis and “Standard Form” as the y-axis.

4. Describe what the graph looks like. Is it a line? A curve? A parabola?

5. Does your graph ever cross the x-axis into quadrant III or IV? Why or why not?

6. How could you write 4^3 as a power of 2?