

4-3

Reteaching

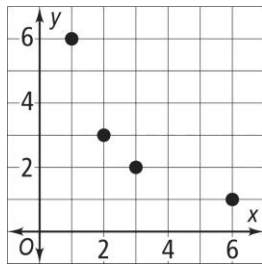
Patterns and Nonlinear Functions

If the points of the graph of a function are in a straight line, the function is a **linear function**. If the points of the graph of a function are not in a straight line, the function is a **nonlinear function**.

Problem

Is the function given by the table at the right *linear* or *nonlinear*?

Graph the function.



x	y
1	6
2	3
3	2
6	1

The points are not in a straight line, so the function is nonlinear.

Do you like to solve puzzles? When you are given a list of function values and you are asked to find the rule for the function, you are solving a puzzle. You are looking for a rule that works for all pairs of numbers.

Problem

What is a rule that represents the function given by the table below?

x	y
6	3
8	5
9	6
12	9

Try a rule. Is there an operation or sequence of operations that relates the values in the first column of the table to the values in the second column?

Try division: $6 \div 2 = 3$, but $8 \div 2 \neq 5$.

Try another rule. $6 - 3 = 3$ and $8 - 3 = 5$.

Check to make sure this works for all pairs of numbers.

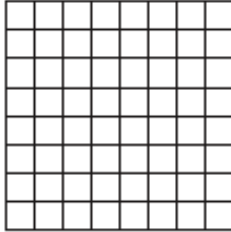
$9 - 3 = 6$ and $12 - 3 = 9$.

The function can be represented by the rule $y = x - 3$.

Graph the function shown by each table. Tell whether the function is *linear* or *nonlinear*.

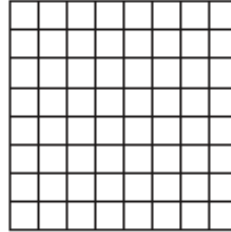
1.

x	y
0	1
2	3
3	4
6	7



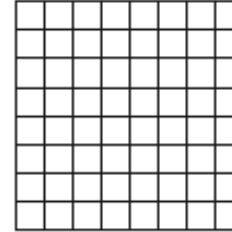
2.

x	y
2	1
3	3
4	5
5	7



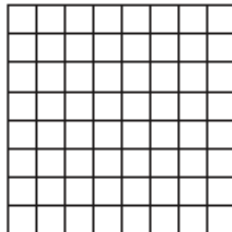
3.

x	y
1	4
2	1
3	0
4	1



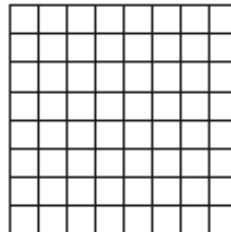
4.

x	y
2	6
3	4
4	3
6	2



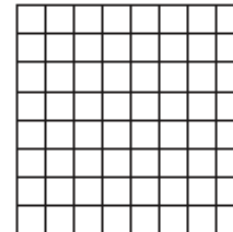
5.

x	y
-4	4
-3	3
0	0
2	2



6.

x	y
0	1
2	2
4	3
6	4



Each set of ordered pairs represents a function. Write a rule that represents the function.

7. $(2, 10), (4, 20), (5, 25), (7, 35), (9, 45)$

8. $(2, 5), (4, 9), (5, 11), (7, 15), (10, 21)$

9. $(0, 0), (1, 1), (2, 8), (3, 27), (4, 64)$

10. $(2, 5), (3, 10), (4, 17), (5, 26), (6, 37)$