Key

Algebra 1
Introduction to Functions

Name: _____
Date: _____

Warm-Up:

How do we remember order of operations? PEMDAS

1. $15 \times 2 \div 6$
   $30 \div 6$
   $\boxed{5}$

2. $3(7-1)-4$
   $3(6)-4$
   $18-4$
   $\boxed{14}$

3. $6-4 \div 2+5$
   $6-2+5$
   $4+5$
   $\boxed{9}$

4. $2-(1-3) \times 2$
   $2-(-2) \times 2$
   $2--4$
   $2+4$
   $\boxed{6}$

A relation is a relationship between two sets of data.

Every relation has a **domain** and a **range**.

	Domain:	Range:
	x-coordinate	y-coordinate
	input	output
	independant values	dependent values

A function is a special relation in which each input is mapped to only one output.

[In other words, no x's repeat.]
each x has only one y

Consider the following relation: **{(-1, 4), (2, 0), (-4, -7), (3, 5), (4, -1)}**

Function? yes Domain: {-1, 2, -4, 3, 4} Range: {-7, -1, 0, 4, 5}

put in order! {-4, -1, 2, 3, 4}

Consider the following relation: **{(2, -3), (1, 6), (-5, -4), (2, 4), (6, 0)}**

Function? No Domain: {-5, 1, 2, 6} Range: {-4, -3, 0, 4, 6}

x's repeat w/ different y's

Consider the following relation: **{(-2, 2), (-1, 2), (0, 2), (1, 2), (2, 2)}**

Function? yes Domain: {-2, -1, 0, 1, 2} Range: {2}

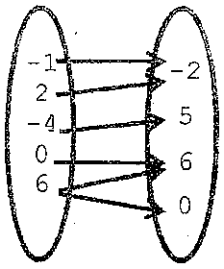
Determine if the following tables and mappings are functions. Describe the domain and range.

x	y
-2	14
1	10
4	6
7	2
11	-2

Function? Yes

Domain: $\{-2, 1, 4, 7, 11\}$

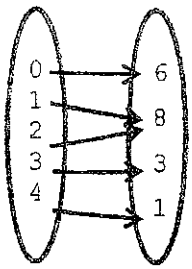
Range: $\{-2, 2, 6, 10, 14\}$



Function? No

Domain: $\{-4, -1, 0, 2, 6\}$

Range: $\{-2, 0, 5, 6\}$



Function? Yes

Domain: $\{0, 1, 2, 3, 4\}$

Range: $\{1, 3, 6, 8\}$

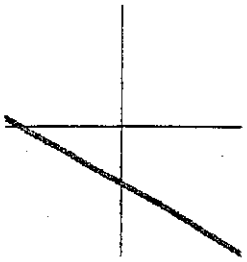
x	y
2	7
-1	2
0	-5
4	3
4	-2

Function? No

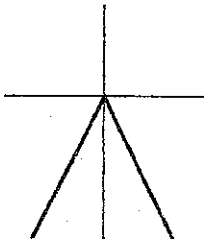
Domain: $\{-1, 0, 2, 4\}$

Range: $\{-5, -2, 2, 3, 7\}$

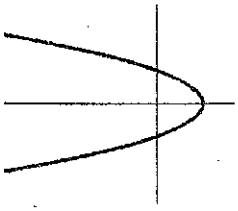
In order to determine if a *graph* is a function, use the vertical line test. Vertical line doesn't touch graph more than once



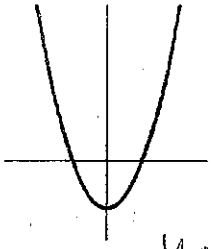
Function? Yes



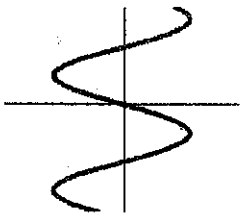
Function? Yes



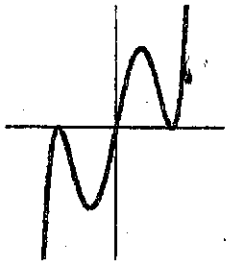
Function? No



Function? yes



Function? No



Function? Yes

Ways to Represent RELATIONS

TABLES

Domain Range

x	y
3	1
-2	-4
0	2
3	6

Domain: $\{-2, 0, 3\}$

Range: $\{-4, 1, 2, 6\}$

Function? No, x's repeat

ORDERED PAIRS

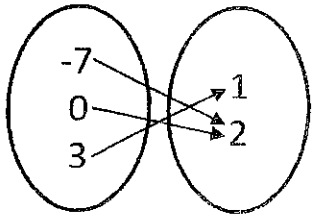
$\{(-1, 2), (0, 5), (2, 7)\}$

Domain: $\{-1, 0, 2\}$

Range: $\{2, 5, 7\}$

Function? yes

MAPPINGS

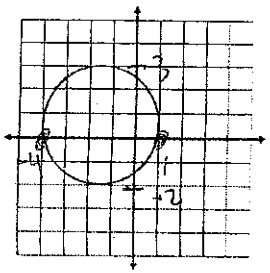


Domain: $\{-7, 0, 3\}$

Range: $\{1, 2\}$

Function? yes

GRAPHS



Domain: $[-4, 1]$

Range: $[-2, 3]$

Function? No → fails vertical line test

Name _____ Date _____ Class _____

LESSON 8-2

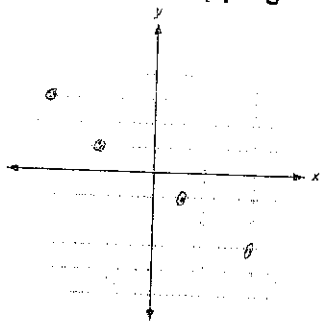
Practice B

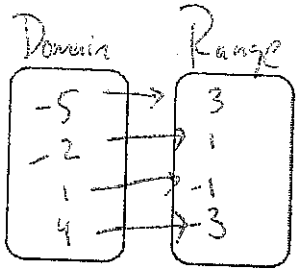
Relations and Functions

Express each relation as a table, as a graph, and as a mapping diagram.

1. {(–5, 3), (–2, 1), (1, –1), (4, –3)}

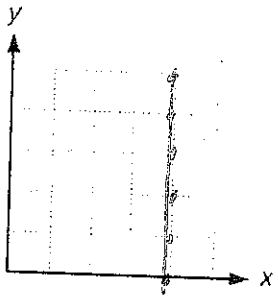
x	y
-5	3
-2	1
1	-1
4	-3

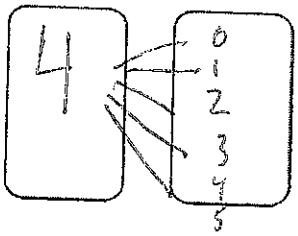




2. {(4, 0) (4, 1), (4, 2), (4, 3), (4, 4), (4, 5)}

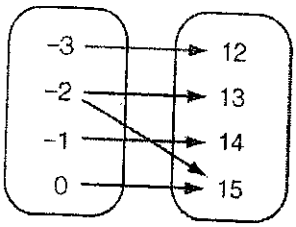
x	y
4	6
4	1
4	2
4	3
4	4
4	5





Give the domain and range of each relation. Tell whether the relation is a function. Explain.

3.



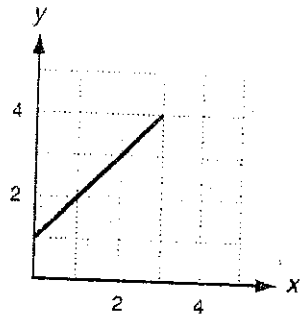
D: {-3, -2, -1, 0}

R: {12, 13, 14, 15}

Function? No

Explain: X's repeat w/ different y's

4.



D: [0, 3] or {0 ≤ x ≤ 3}

R: [1, 4] or {1 ≤ x ≤ 4}

Function? yes

Explain: passes vertical line test

5.

x	y
8	8
6	6
4	4
2	6
0	8

D: {0, 2, 4, 6, 8}

R: {4, 6, 8}

Function? yes

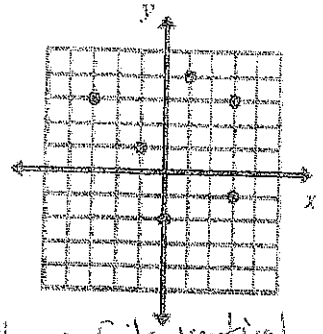
Explain: X's don't repeat

Function Notation and Evaluating Functions Practice Worksheet B

Name_____ Class Period_____

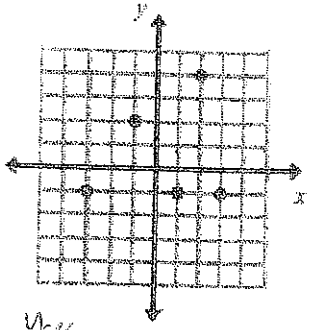
Decide whether the graph represents y as a function of x. If it is a function, give the domain and range.

1.



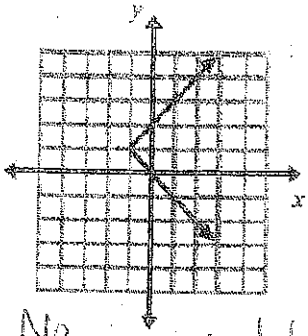
No → fails vertical line test

2.



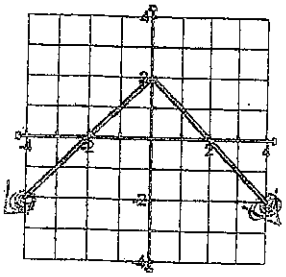
yes
D: {-3, -1, 1, 2, 3}
R: {-1, 2, 4}

3.



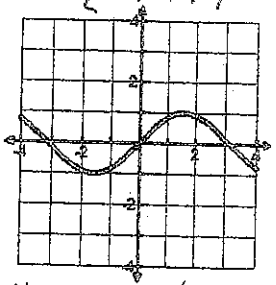
No
Fails vertical line

4.



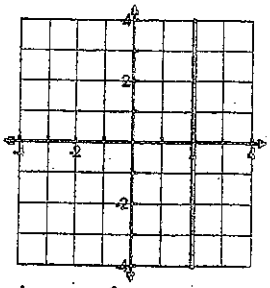
yes D: [-4, 4]
R: [-2, 2]

5.



yes D: [-4, 4]
R: [-1, 1]

6.



No fails vert. line test

Decide whether the relation is a function.
If it is a function, give the domain and the range.

7.

Input	Output
1	7
	-7
2	8
	-8

No!

8.

Input	Output
3	2
5	4
7	6

yes D: {3, 5, 7}
R {2, 4, 6}

9.

Input	Output
0	-6
2	-4
4	-2
6	0

yes
D: {0, 2, 4, 6}
R {-6, -4, -2, 0}