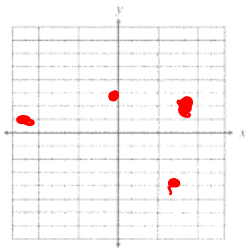
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
RELATION	A set of ordered pairs Example: {(-6,2) (5,-1) (0,6) (-4,1)} Can be shown as: ordered pairs, tables, graphs
x **DOMAIN**	The set of x values within a relation
y **RANGE**	The set of y values within a relation.

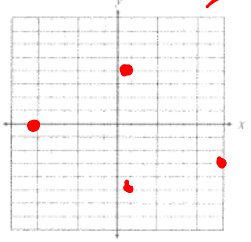
examples

1

ORDERED PAIRS	TABLE	GRAPH
{(5, 2), (-7, 1), (0, 3), (4, -4)}	x: 5, -7, 0, 4 / y: 2, 1, 3, -4	

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

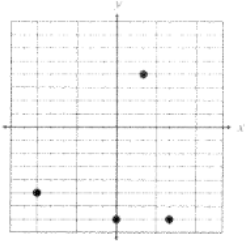
2

ORDERED PAIRS	TABLE	GRAPH
{(-6, 0), (1, 4), (8, -3), (1, -5)}	x: -6, 1, 8, 1 / y: 0, 4, -3, -5	

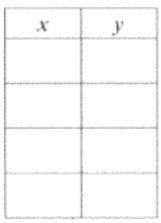
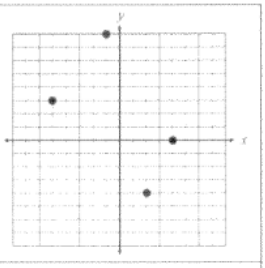
Domain: {-6,1,8} Range: {-5,-3,0,4}

3 For questions 3 and 4, use the points plotted on the graph.

(-6,-5) (0,-7) (4,-7) (2,4)

TABLE	GRAPH
x: -6, 0, 2, 4 / y: -5, -7, 4, -7	

Domain: {-6,0,2,4} Range: {-7,-5,4}

	4		
	Domain:	Range:	

FUNCTION

A relation is a function if each x value is paired with only one y value

examples

Directions: Determine whether the relation is a function.

5. {(6, -2), (-4, -1), (2, 0), (-7, 4)} — yes

6. {(1, 5), (-5, -3), (-8, -1), (1, -7)} — No (5, -7)

7. {(1, 4), (2, 4), (3, 4), (4, 4)} — yes

8. {(-7, 4), (-4, 1), (-4, -9), (0, -6)} — no

9.

x	y
-2	4
-1	1
0	0
1	1
2	4

yes

10.

x	y
-7	0
-4	1
-1	2
5	3
8	4

yes

11.

x	y
-3	-2
-3	-1
-3	0
-3	5
-3	9

No

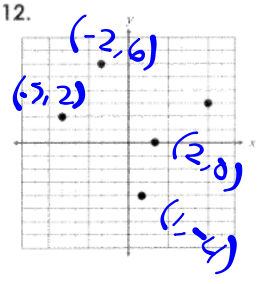
VERTICAL LINE TEST

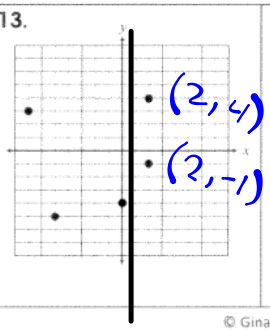
When given the **graph** of a relation, the vertical line test can be used to determine whether the relation is a function.

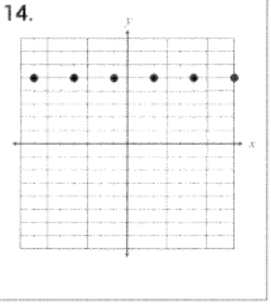
Vertical Line Test: A vertical line passes through a relation no more than one time at any given point

examples

Directions: Use the vertical line test to determine whether the relation is a function.

12. 

13. 

14. 

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Equations as Functions	• Functions can also be represented by an equation (or rule). • The equation will generate ordered pairs by taking an input (x) that results in a certain output (y) • The x-value is always called the independent variable. • The y-value is always called the dependent variable. • The graph of an equation is the set of all its ordered pairs, which often form a line or a curve.
Function Tables	**Directions:** Complete each function table.

1. $y = x + 7$

x	$x+7$	y	(x, y)
-1	$-1+7$	6	(-1,6)
0	$0+7$	7	(0,7)
2	$2+7$	9	(2,9)
4	$4+7$	11	(4,11)

2. $y = x - 13$

x	$x-13$	y	(x, y)
3	$3-13$		
6			
9			
12			

3. $y = 1 - x$

x		y	(x, y)
-5			
-4			
-3			
-2			

4. $y = 2x - 7$

x		y	(x, y)
0			
2			
5			
8			

5. $y = \frac{1}{2}x - 9$

x		y	(x, y)
-6			
-2			
0			
14			

6. $y = -\frac{4}{3}x + 11$

x		y	(x, y)
-9			
-3			
3			
6			

Why Are There No Wal-Marts In a War Zone?

For each equation, only two of the given ordered pairs are solutions. Circle the number-letter pair next to each solution. Then write the letter in the matching numbered box at the bottom of the page.

1. $y = 3x - 1$

- 16 · E $(4, 11)$
- 18 · L $(3, 5)$
- 7 · A $(-5, -16)$
- 12 · D $(-2, 7)$

2. $4x - y = 5$

- 20 · R $(4, 10)$
- 13 · F $(-2, -9)$
- 18 · O $(1, -1)$
- 2 · H $(-3, -17)$

3. $-3x + 2y = 8$

- 12 · L $(-6, -5)$
- 23 · C $(-4, -1)$
- 28 · N $(-2, 2)$
- 20 · E $(2, 7)$

4. $2x + y = 3$

- 25 · V $(-4, -5)$
- 9 · R $\left(-\frac{3}{2}, 8\right)$
- 23 · A $(-1, 5)$
- 1 · T $\left(\frac{7}{2}, -4\right)$

5. $y = \frac{5}{2}x - 9$

- 3 · O $(-2, -11)$
- 26 · E $(0, -9)$
- 13 · L $(2, -4)$
- 11 · I $(4, 3)$

6. $-4x + 3y = -6$

- 9 · E $(-3, -6)$
- 19 · N $\left(-\frac{5}{4}, -1\right)$
- 4 · R $(5, -2)$
- 28 · S $\left(\frac{9}{4}, 1\right)$

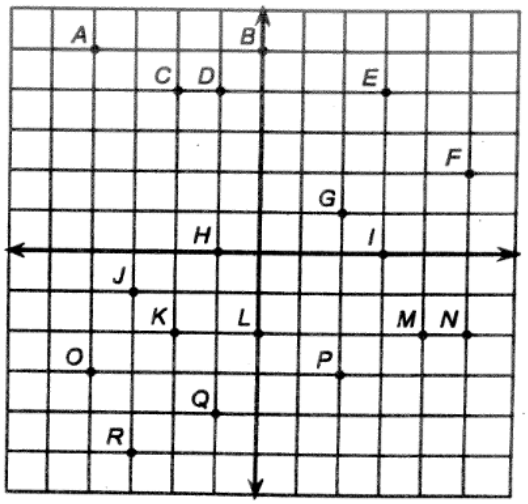
In Exercises 7-12, possible solutions are given as coordinate points that represent ordered pairs.

7. $2x + 3y = 7$

- 27 · Y N
- 3 · E G
- 8 · D J
- 25 · G A

8. $5x - 2y = -5$

- 6 · S E
- 4 · Y R
- 11 · A H
- 15 · W P



9. $y = -\frac{3}{2}x + 4$

- 19 · M M
- 22 · N C
- 17 · R B
- 6 · H G

10. $-x + 4y = -8$

- 27 · T L
- 5 · S F
- 8 · V O
- 10 · F J

11. $y = x^2 - 5$

- 21 · N P
- 24 · L K
- 15 · B Q
- 22 · T E

12. $y = 2x^2 - 3x - 1$

- 10 · W I
- 17 · C D
- 24 · R G
- 21 · S R

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

1. $y = 3x - 1$

- 16 · E $(4, 11)$
- 18 · L $(3, 5)$
- 7 · A $(-5, -16)$
- 12 · D $(-2, 7)$

$y = 3x - 1$

$11 = 3(4) - 1$ ✓

$3 = 3(5) - 1$

$-16 = 3(-5) - 1$

$-16 = -15 - 1$

What Did Farmer John Show His Chicken When She Wouldn't Lay Any Eggs?

Determine whether each relation is a function. Indicate whether it "is a function" or is "not a function" by circling the appropriate letter in the chart. The answer to the title question is found by reading the circled letters in the top row, then the circled letters in the bottom row.

1. $\{(-1, 8), (0, 15), (1, -4), (2, 0)\}$
2. $\{(-2, 7), (6, 2), (-2, -3), (0, 9)\}$
3. $\{(-5, 2), (5, 2), (0, -3), (3, -8), (-7, 4), (-1, -1)\}$
4. $\{(-7, 2), (4, -6), (2, -2), (-3, 9), (0, -11), (4, 0)\}$

5.

−6	4
−4	0
−2	−5
0	−5
2	0
4	4

6.

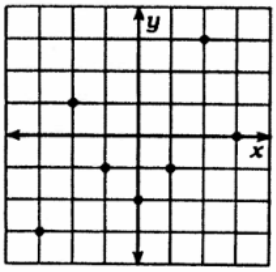
8	7
−3	16
−9	0
15	33
−1	−1
−9	−6

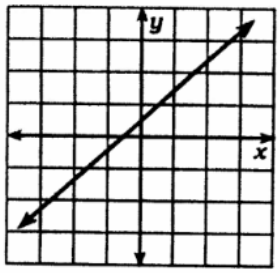
7.

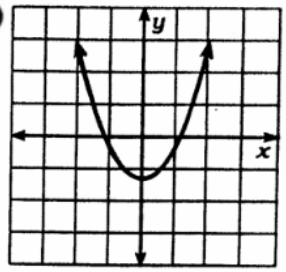
5	18
−2	−2
0	12
12	0
−40	17
−5	18

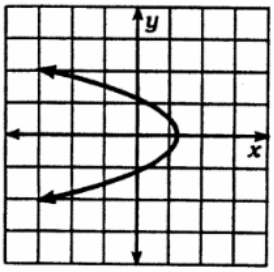
8.

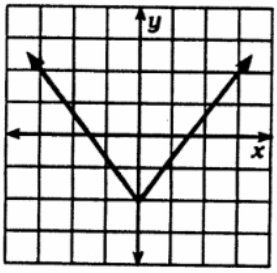
−1	75
0	80
1	85
0	90
−1	95

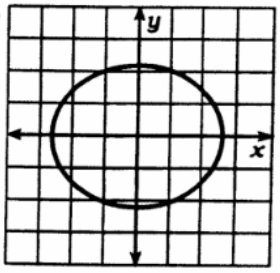
9. 

10. 

11. 

12. 

13. 

14. 

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IS A FUNCTION >	A	R	G	E	O	L	O	F	D	E	G	O	G	G
NOT A FUNCTION >	I	S	T	A	T	M	E	P	O	L	A	L	L	E

Introduction to Graphs and Functions:
Determining Whether a Relation Is a Function

6.5