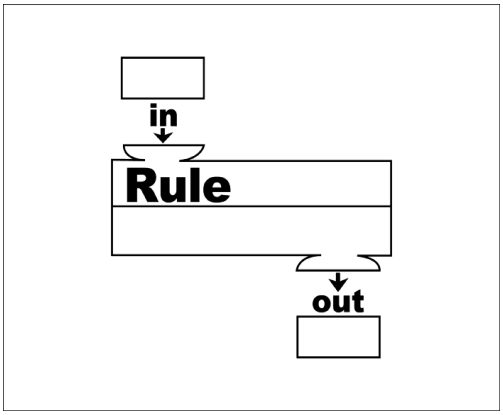
Algebra RH

Essential Questions: What is a function? How can we determine if a relation is a function?

Do Now: Carlos needs to buy some new pencils from the school supply store at his school. Carlos asks his classmates if they know how much pencils cost. Angela says she bought 2 pencils for $0.50. Paige bought 3 pencils for $0.75, and Spencer bought 4 pencils for $1.00.

Think about this:

We can think about the rule for finding the price of pencils as a machine. If Carlos puts the number of pencils he wants to buy into the machine, the machine applies the rule and tells him the total cost of that number of pencils.



Number of Pencils	Rule	Total Cost
2		
3		
4		
x		

A) Using the prices presented in the problem, complete the table above.

B) How much does one pencil cost?

C) Using your rule, find the cost of 15 pencils.

D) Can this relationship (*rule*) be graphed?

Functions

A ***function*** is a relation (a set of ordered pairs) in which each **input** (*x*-value) is assigned to exactly one **output** (*y*-value).

Domain:_____

Range:_____

Functions can be represented in multiple ways.

Table

Input	Output
2	1
4	2
6	3

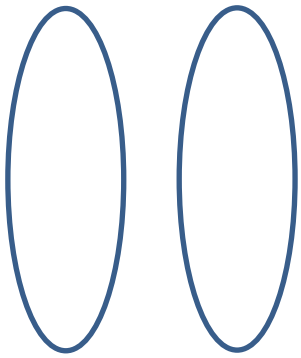
Ordered Pairs

(,)

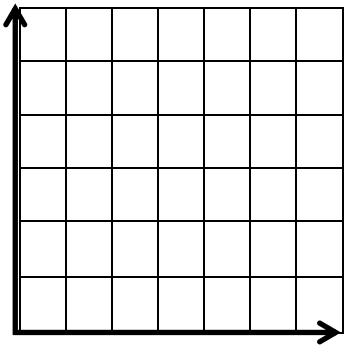
(,)

(,)

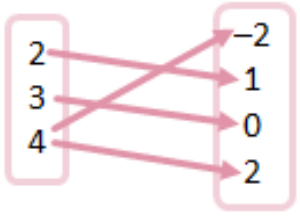
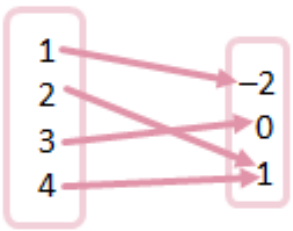
Mapping Diagram



Graph

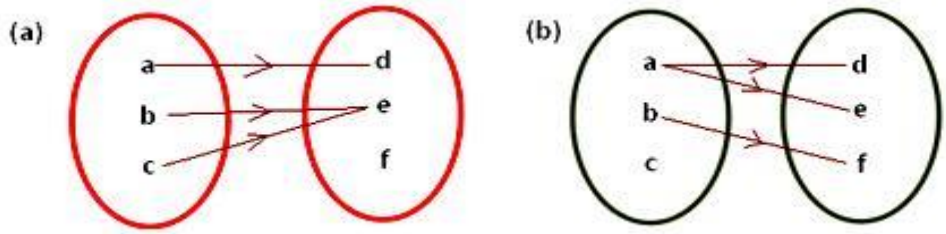


How can I determine if a relation is a function from a set of ordered pairs?

Points	Mapping Diagram	Function? Yes or No
{(2, 1), (3, 0), (4, 2), (4, –2)}		
{(1, –2), (2, 1), (3, 0), (4, 1)}		

Let's apply what we've learned.

1) Determine which mapping diagram is a function. Justify your response.



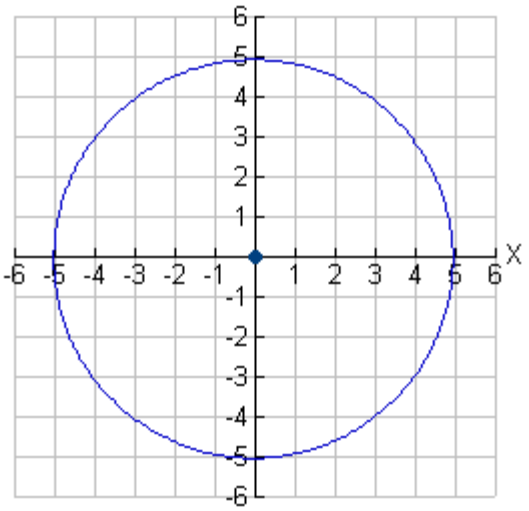
2) Determine if the relation is a function. Be ready to justify your response.

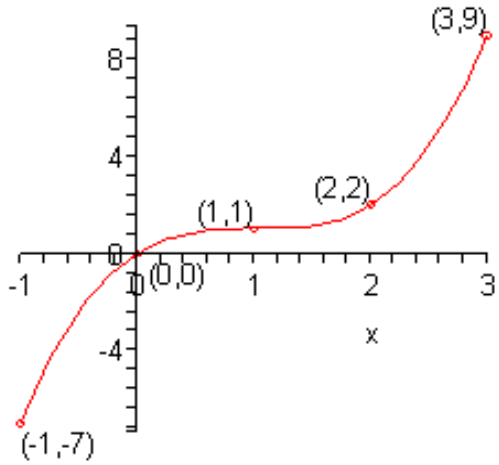
domain	2	5	7	25	42
range	8	2	5	5	10

input	4	4	3	2	1
output	4	5	6	7	8

x	-1	-5	-7	-3	-9
y	2	2	2	2	2

How can I determine if a graph is a function?

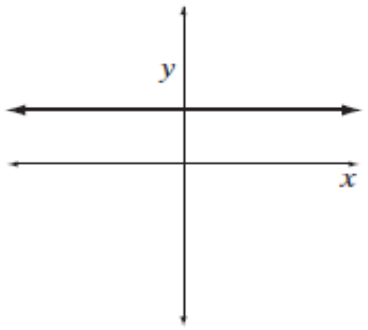




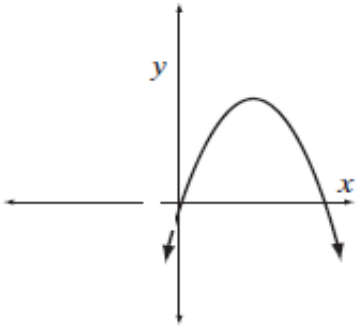
Vertical Line Test

- Used to determine if a graph is a function.
- A vertical line must pass through exactly one point on each part of the graph for the graph to be a function.

3) Which graphs represent functions?



A



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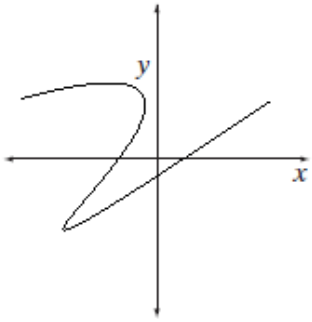
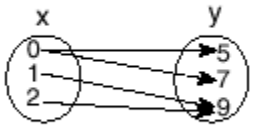
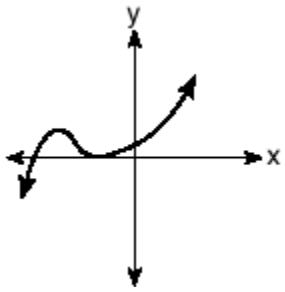


C

4) Which diagram represents a relation in which each member of the domain corresponds to only one member of its range?



A



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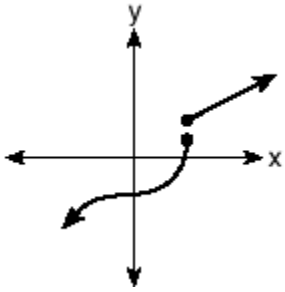


C

The Take Away…

We can determine if relationships represent functions.

A mapping diagram shows a function if _____

_____

A table of values or a set of ordered pairs represents a function if _____

_____

A graph represents a function if _____

_____

1) Which set of ordered pairs is ***not*** a function?

(1) {(0,0), (1,1), (2,2), (3,3)} (2) {(1,2), (3,4), (4,5), (5,6)}
(3) {(4,1), (5,1), (6,1), (7,1)} (4) {(3,1), (2,1), (1,2), (3,2)}

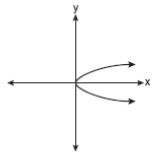
2) Which relation represents a function?

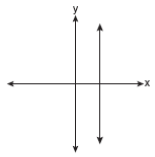
(1) $\{(0,3),(2,4),(0,6)\}$
(2) $\{(-7,5),(-7,1),(-10,3),(-4,3)\}$
(3) $\{(2,0),(6,2),(6,-2)\}$
(4) $\{(-6,5),(-3,2),(1,2),(6,5)\}$

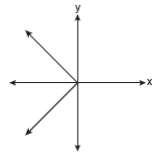
3) Given the relation. R = {(-2,3), (***a***, 4), (1,9), (0,7)}Which replacement for ***a*** makes this relation a function?

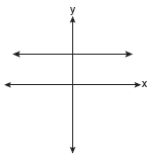
(1) 1 (2) -2 (3) 0 (4) 4

4) Which graph represents a function?

(1) 

(2) 

(3) 

(4) 

5) Using a mathematical model (*mapping diagram, table of values, ordered pairs, graph*), give an example of a relation that is a function. Give an example of a relation that is *not* a function. Explain why each of your examples is a function or *not* a function.