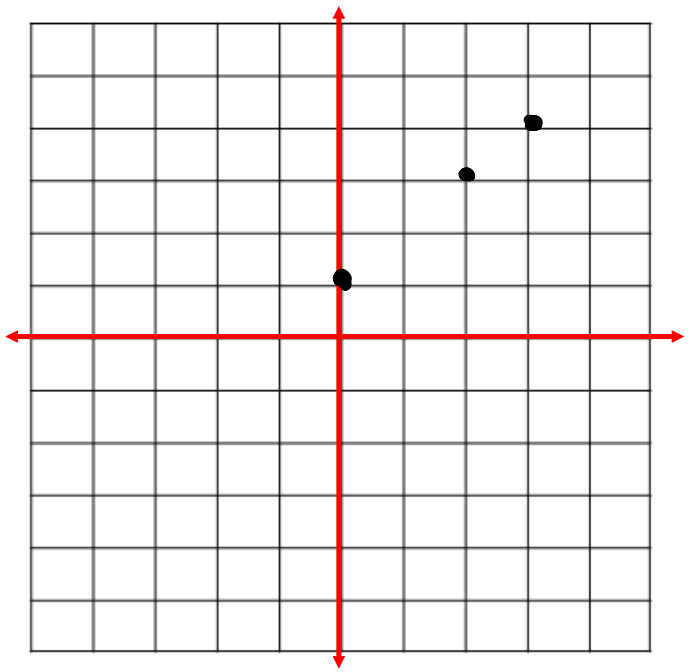
Relations: set of ordered pairs

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

{ set }



Other ways to show a relation:

equation

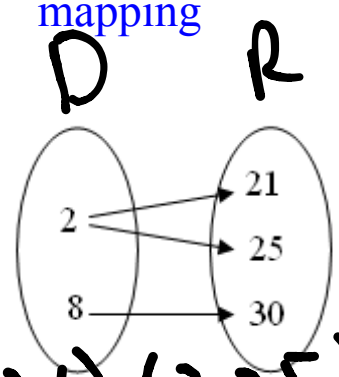
$$y = \frac{1}{2}x - 6$$

table

Domain Range

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

mapping



(2,21) (2,25) (8,30)

D = {2, 8}

R = {21, 25, 30}

Domain: set of first elements of a relation x element

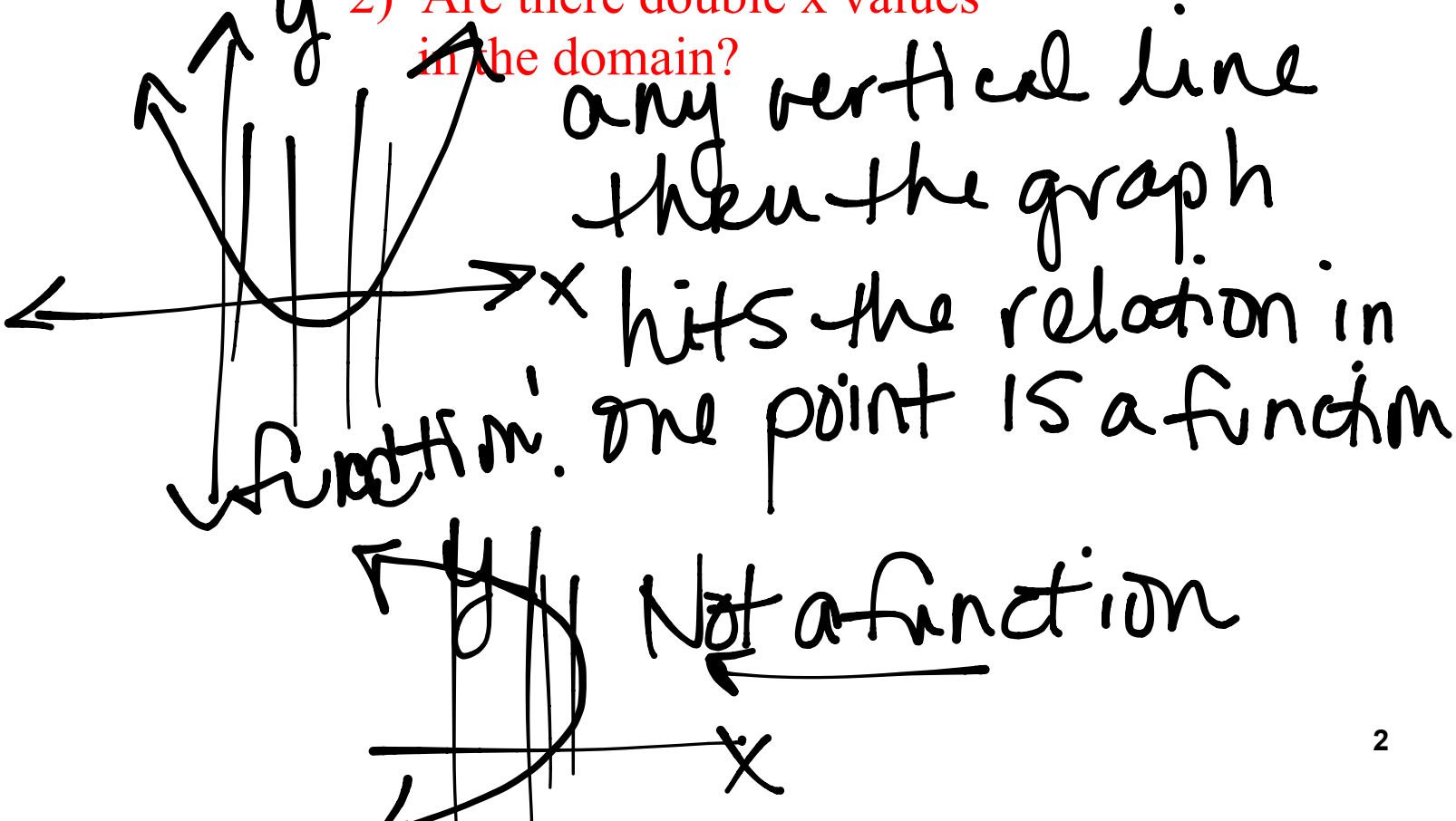
Range: set of second elements of a relation y elements

Function: A relation in which each domain element is paired with exactly one range element

2 ways to verify a function:

1) Does the function pass the Vertical Line Test?

2) Are there double x values in the domain?

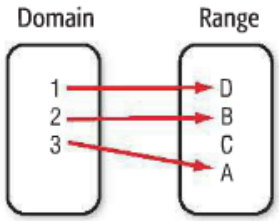


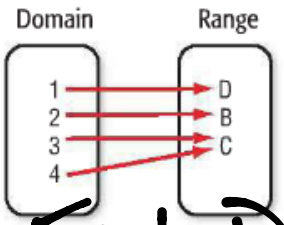
FUNCTION

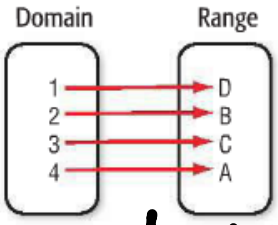
No double X-values in domain

KeyConcept Functions

one-to-one function	onto function	both one-to-one and onto
Each element of the domain pairs to exactly one unique element of the range.	Each element of the range corresponds to an element of the domain.	Each element of the domain is paired to exactly one element of the range, and each element of the range corresponds to a unique element of the domain.



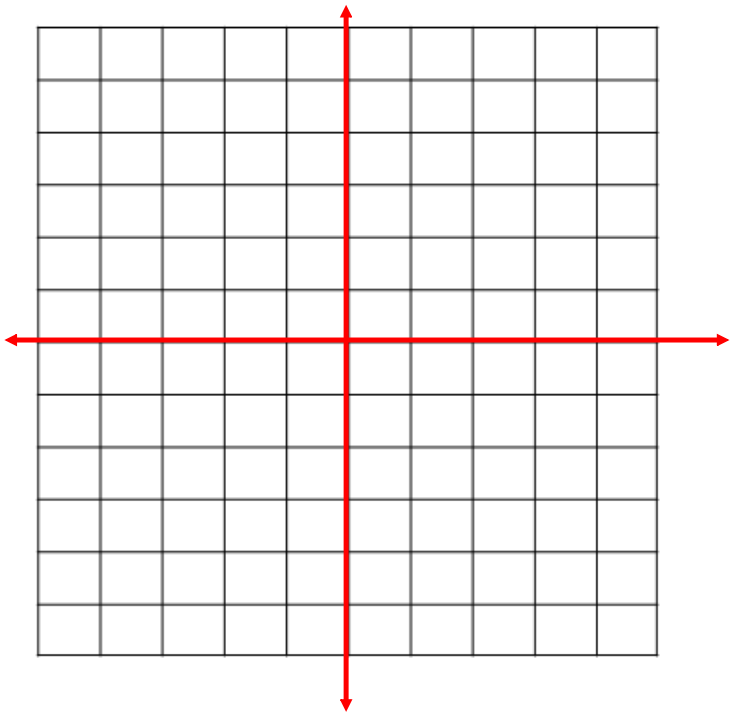




X-values appear once

Each D element pairs with all range elements

each X corresponds to each y-value



Function Notation f(x) reads "f of x"

In an equation, y can be replaced with f(x)
called function f

$y = -2x + 1$
$f(x) = -2x+1$ } same equation

Find f(-3) "find the value of function f when x = -3?"

Replace x with -3

$f(-3) = -2(-3) + 1$

$f(-3) = 7$ → this is an ordered pair $(-3, 7)$

Functions can have different names like $g(x) = x^2 - 1$ or $h(x) = 2x + 6$