9/19

- Functions and relations

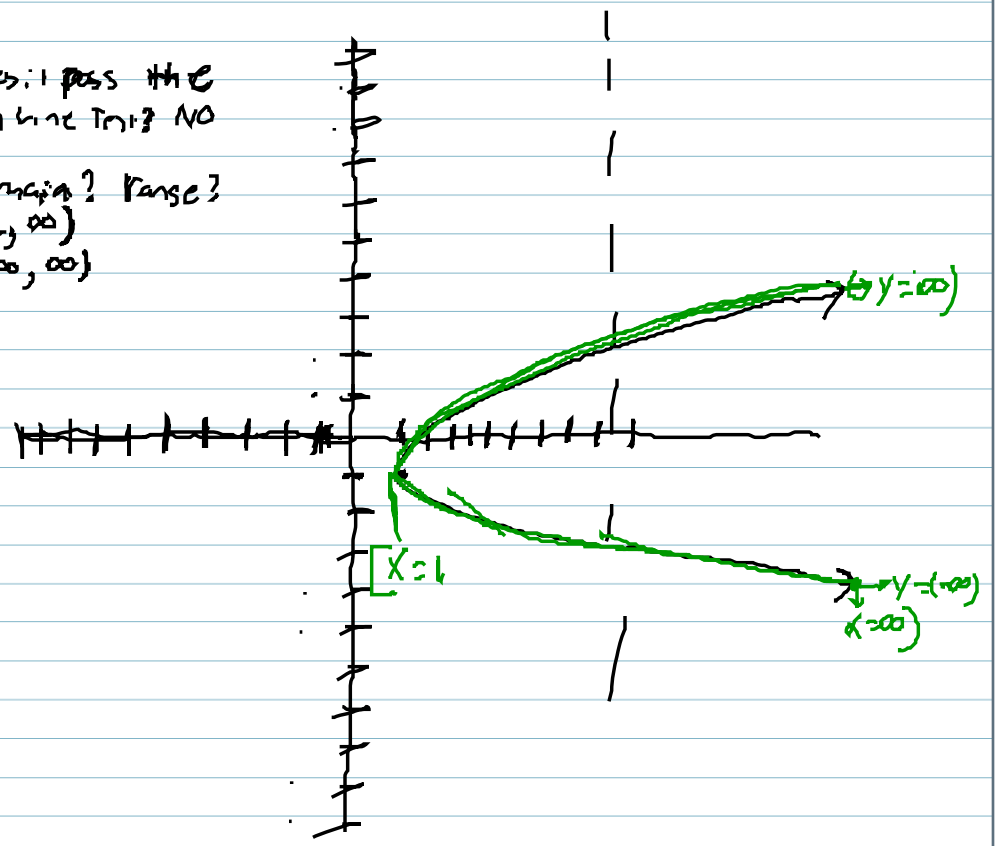
Function - A relation with exactly one input per output
Relation - A set of inputs and outputs in which the relationship is stated

Ex1 What steps would we use to determine if $x = 4y^2$ was a function?

1. Graph it
2. Vertical Line Test

Ex2 1. Does it pass the Vertical Line Test? NO

2. Domain? Range?
D = $[1, \infty)$
R = $(-\infty, \infty)$



9/19

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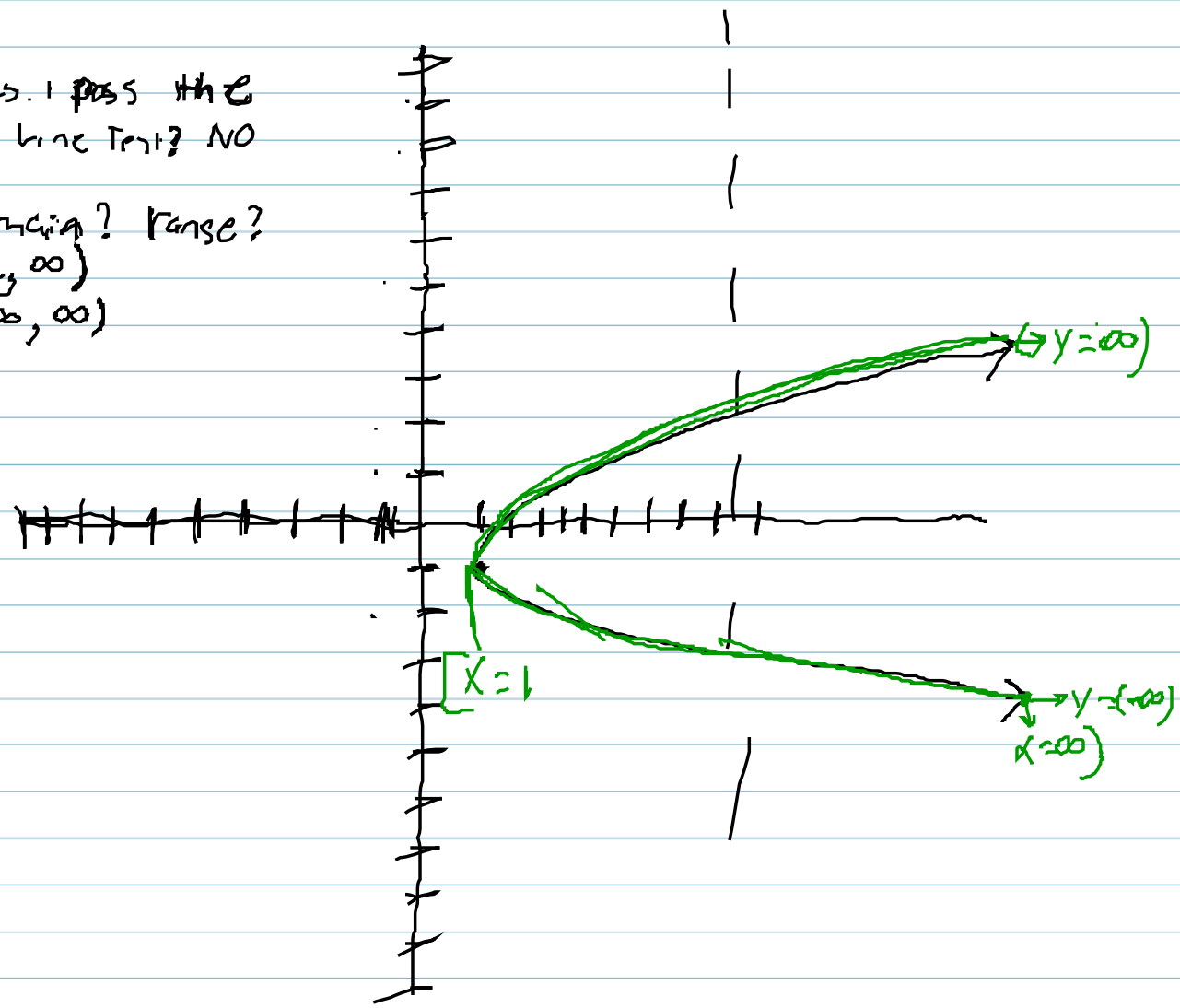
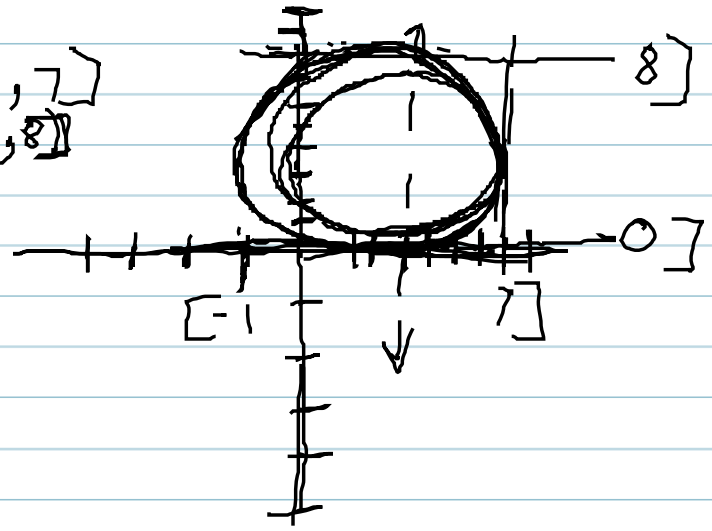


Ex3

D: [-1, 7]
R: [0, 8]



*12 days befor Ch 3 test
Extra Cred: 9/26 4:30-5:30 at room 4-235

- 3.1 Continued

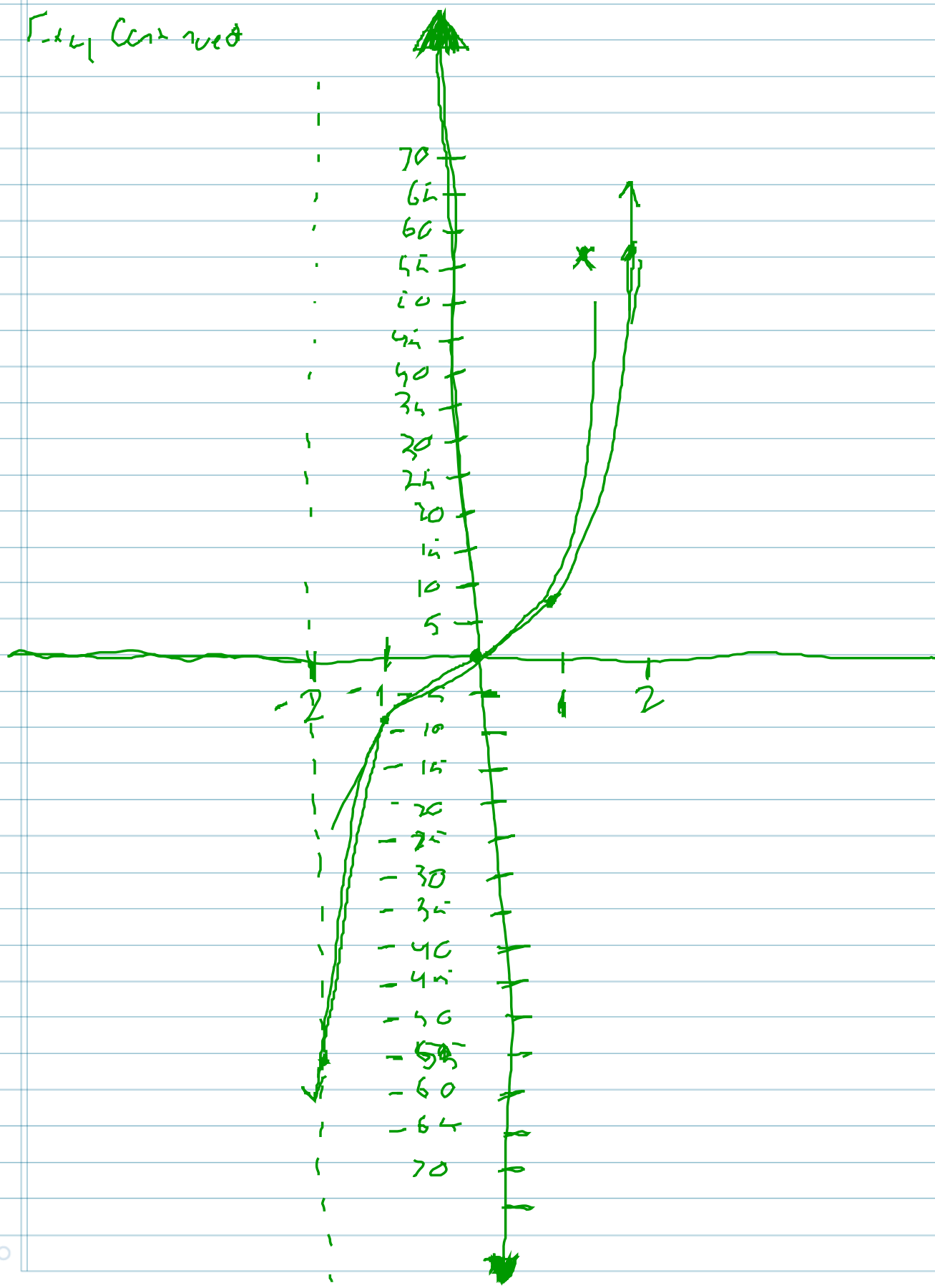
Graphing Nonlinear Values

1. Assume a value for one variable and solve for the other.
2. Make these values into ordered pairs
3. repeat last 2 until you have enough pts
4. Determine x and y axis scale
5. Plot the pairs
6. Connect the points

Ex4 $y = 7x^3$
nonlinear

X	Y
1	7
-1	-7
0	0
~~3~~	~~189~~
~~-3~~	~~-189~~
-2	-56
~~-3~~	~~-189~~
2	56

$f(x) = x^3$


70
65
60
55
50
45
40
35
30
25
20
15
10
5
-2
-1
1
2
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70

F:5 $y = |x+1|$

not linear

x	y
-2	1
-1	0
0	1
1	2
2	3
-2.5	1.5
5	6
-5	4

$x = -5$

$y = |-5+1|$

$y = |-4|$

$y = 4$

$x = -2.5$

$y = |-2.5+1|$

$y = |-1.5|$

$y = 1.5$

$x = -1$

$y = |-1+1|$

$y = 0$

$x = 5$

$y = |5+1|$

$y = |6|$

$y = 6$

$x = -2$

$y = |-2+1|$

$y = |-1|$

$y = 1$

$x = 0$

$y = |0+1|$

$y = |1|$

$y = 1$

$x = 1$

$y = |1+1|$

$y = |2|$

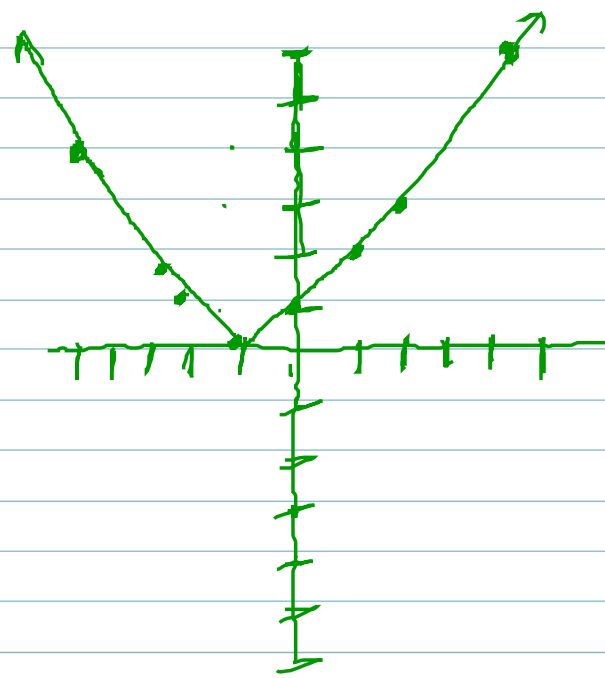
$y = 2$

$x = 2$

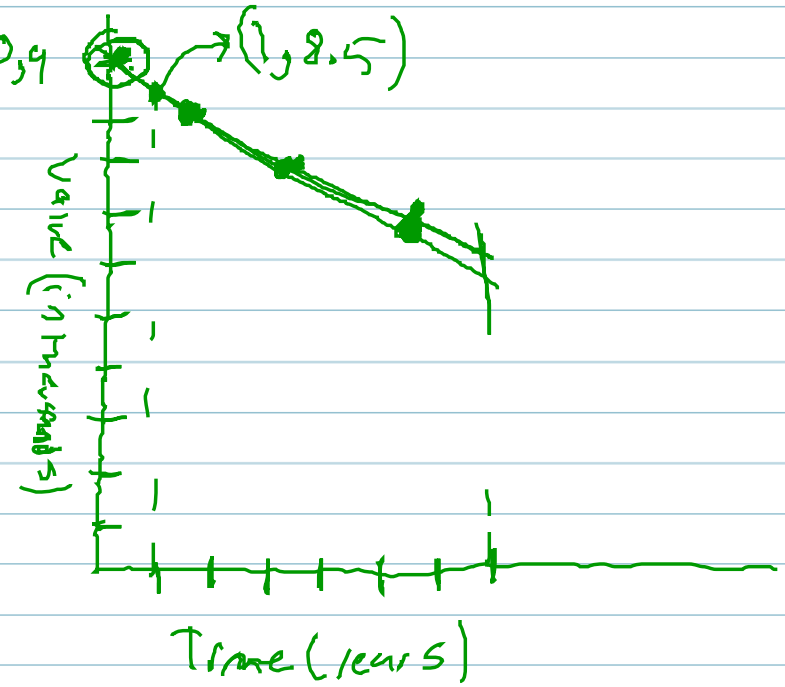
$y = |2+1|$

$y = |3|$

$y = 3$

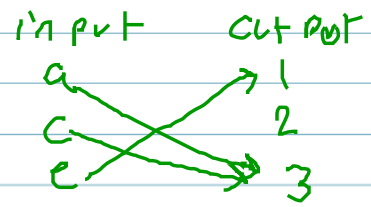


Ex 6

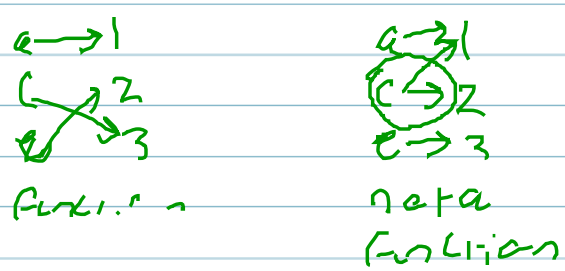


3.2 reminders

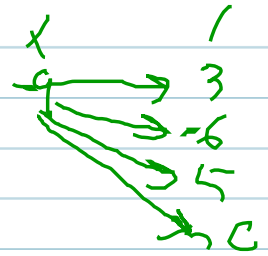
- Relations can be shown in mappings



- Domain is the list of all inputs or X's
- Range is the list of all outputs or Y's
- Functions require 1 input for every output



Ex 7



Is this a function?
No

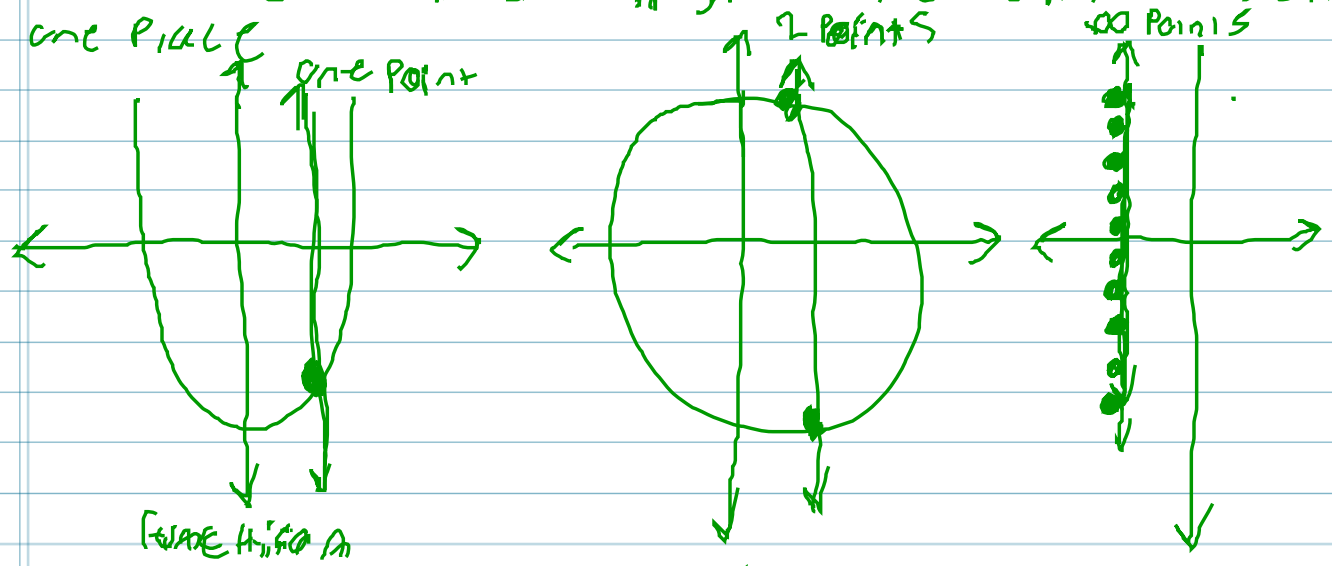
D = {-9}
R = {3, -6, 5, 50}

Ex 8 {(-3,10), (7,10), (3,1), (-6,-8)}

Function? Yes
D = {-3, 7, 3, -6}
R = {10, 1, -8}

Vertical Line Test: a relation is not a function if a vertical line can intersect the graph of the function in more than one point

Ex 9



Function

not a function

not a function