Name: Key Period: same x can't have different ys

Functions Unit – Notes and Practice I

A **relation** is A set of ordered pairs (0,1), (1,2), (2,4) domain x y-range

The **domain** of a relation is set of 1st coordinates; (x); input

The **range** of a relation is set of 2nd coordinates; (y); output

A **function** is a relation that assigns to each member of a domain (x) exactly one member of range (y).

Members of the domain can be called inputs (or x-values).

Members of the range can be called outputs (or y-values).

1) Arrows can be used to describe a relation. Sometimes these relations are functions.

@ input matched to exactly 1 output

Domain (input)	Range (output)
J →	202
C →	142
E →	138
S →	

Function

Domain (input)	Range (output)
Ch. pizza →	$9.75
Tom. pizza →	$7.25
Meatpizza →	$8.50

Not function
Ch. pizza has more than one output

@ input matched to exactly 1 output

Domain (input)	Range (output)
Al →	A
Cal →	C
Bob →	C

Function

Which of the above are functions? How do you know? Label Function or not a function under each.

2) Find the domain and range for each relation. Is the relation a function? How do you know.

j: {(4, 0), (6, 0), (−3, 0), (−2, 1)}

Domain	Range
4 →	0
6 →	
−3 →	
−2 →	1

function @ input matched to exactly 1 output

k: {(1,5), (1,8), (3, 8), (3, 5)}

input 1 has more than 1 output
AND input 3 has more than 1 output

Domain	Range
1 →	5
3 →	8

Not function

*** f(x) denotes the number assigned to x by the function f. If x is the input, f(x) is the output. For instance, in the function $f(x) = x - 2$: $f(2) = 2 - 2 = 0$ *and* $f(-4) = -4 - 2 = -6$ *and* $f(10) = 10 - 2 = 8$

Previous: $y = 2x + 5$ Now: $f(x) = 2x + 5$ They are the same; $y = f(x)$

*** f(x) denotes the number assigned to x by the function f. If x is the input, f(x) is the output. For instance, in the function $f(x) = x - 2$: $f(2) = \mathbf{2} - 2 = 0$ *and* $f(-4) = \mathbf{-4} - 2 = -6$ *and* $f(10) = \mathbf{10} - 2 = 8$ ***

3) Find the indicated outputs for each function. Show your work.

$f(t) = 2t^2 + 5$; *find* $f(-2)$, $f(0)$, $f(3)$

$f(-2) = 2(-2)^2 + 5 = 8 + 5 = 13$

$f(0) = 2(0)^2 + 5 = 5$

$f(3) = 2(3)^2 + 5 = 23$

x	y
-2	13
0	5
3	23

U-try:

$p(y) = 9y - y^2$; *find* $p(0), p(-2), p(5)$

$p(0) = 9(0) - (0)^2 = 0$

$p(-2) = 9(-2) - (-2)^2 = -22$ ($-18 - 4$)

$p(5) = 9(5) - (5)^2 =$ ($45 - 25$)

x	y
0	0
-2	-22
5	20

$f(x) = |x| + 1; f(3), f(-2)$

$f(3) = |3| + 1 = 4$

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

x	y
3	4
-2	3

y
output

4) Find the range of each function for the given domain.

x
input

$g(t) = t^2 - 5$ *when the domain is the integers between* -4 *and* 2.

$t = \{-3, -2, -1, 0, 1\}$

$g(-3) = (-3)^2 - 5 = 4$

$g(-2) = (-2)^2 - 5 = -1$

$g(-1) = (-1)^2 - 5 = -4$

$g(0) = (0)^2 - 5 = -5$

$g(1) = (1)^2 - 5 = -4$

Recognizing Functions U-try's

Day 2 to end (3 pgs)

Instructions: Answer the following questions individually in a few sentences.

Table #1

Input (number)	0	1	1	2		
Output (number)	2	3	4	3	5	6

Table #2

Input (number)	0	1	1	2	3	4
Output (number)	2	3	3	5	5	6

1. Is Table #1 a function? Why or why not?

Not function, the input 1 has more than 1 output.

2. Is Table #2 a function? Why or why not?

yes, @ input matched to exactly 1 output.

3. Take the values from Table #1 and write them as ordered pairs.

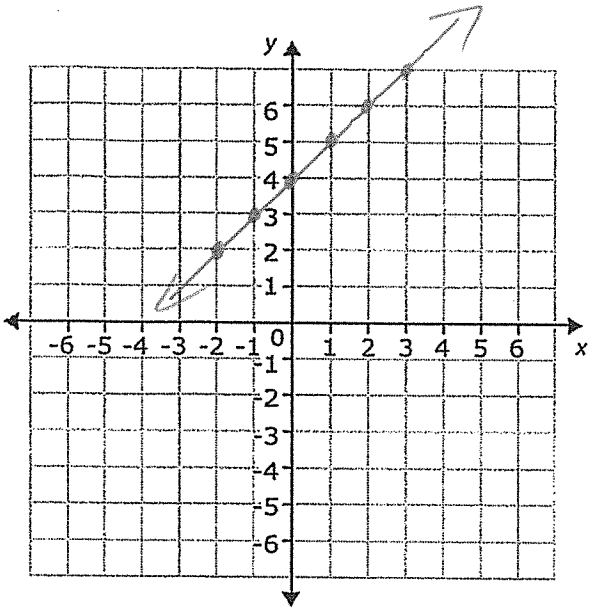
(0,2); (1,3); (1,4); (2,3); (3,5); (4,6)

4. Take the values from Table #2 and write them as ordered pairs.

(0,2); (1,3); (1,3); (2,5); (3,5); (4,6)

U-trig

Graphing Functions: Graph : $f(x) = x + 4$ where the domain is $(-2, -1, 0, 1, 2, 3)$. Make a table of inputs/outputs to make it easier to graph $-2+4$



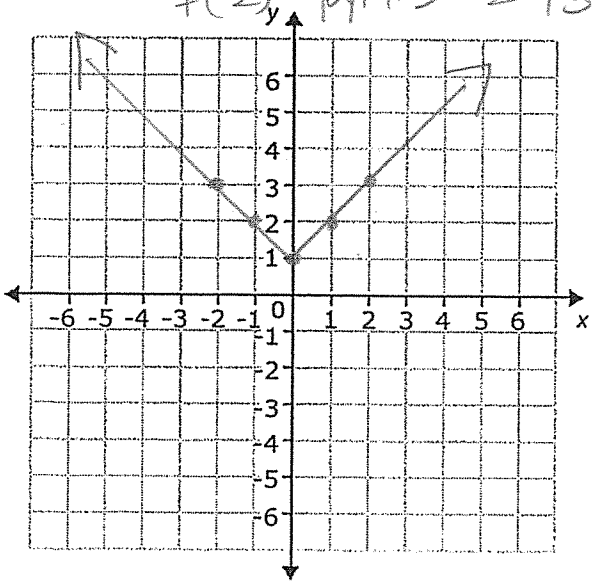
Input	Output
-2	$-2+4=2$
-1	$-1+4=3$
0	$0+4=4$
1	$1+4=5$
2	$2+4=6$
3	$3+4=7$

Graph the following functions. THEN state the domain and range. You will want to consider at least 5 input values. Use 5 pts. from now on (0, 1, 2, -1, -2)

(1) $f(x) = |x| + 1$

$f(0) = |0|+1 = 1$
$f(1) = |1|+1 = 2$
$f(-1) = |-1|+1 = 2$
$f(-2) = |-2|+1 = 3$

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



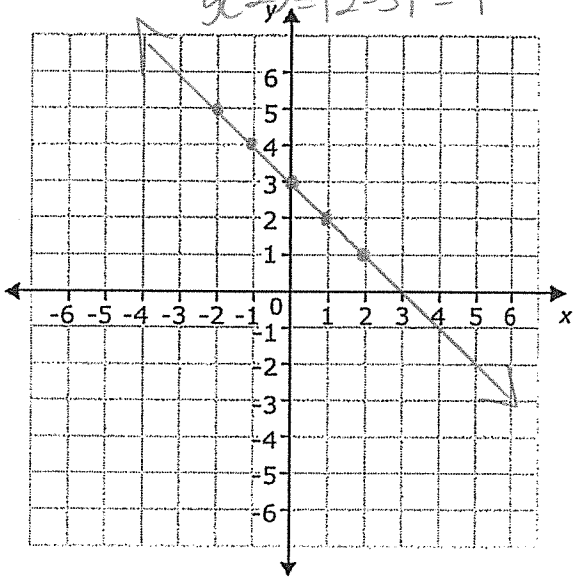
Domain:
Range:

U-trig

$g(x) = |x - 3|$

$g(0) = |0-3| = 3$
$g(1) = |1-3| = 2$
$g(-1) = |-1+3| = 4$
$g(-2) = |-2-3| = 5$
$g(2) = |2-3| = 1$

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



Domain:
Range: