Pre-Algebra
Linear Functions
Example 1

Identify the Domain and Range of the following sets of numbers:

1. $(2,1), (3,7), (4,9), (6,3)$

DOMAIN: 2, 3, 4, 6 $\longrightarrow$ X-VALUES
RANGE: 1, 7, 9, 3 $\longrightarrow$ Y-VALUES
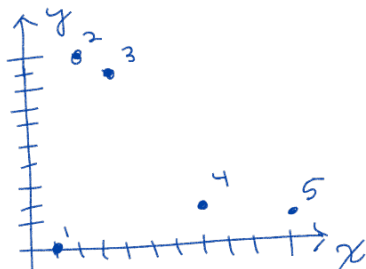
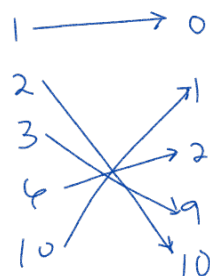2. $(9,1) (1,1), (4,10), (6,2)$

DOMAIN: 9, 1, 4, 6
RANGE: 1, 1, 10, 2

Represent the following relation as a graph and as a mapping diagram. State whether the relation is a function.
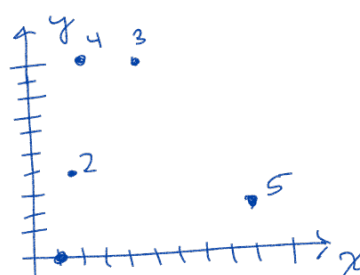
1.

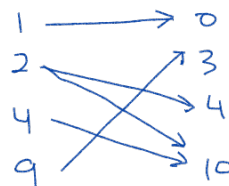| X	1	2	3	6	10
y	0	10	9	2	1

INPUT   OUTPUT

1 $\longrightarrow$ 0
2 $\searrow$ 1
3 $\rightarrow$ 2
6 $\nearrow$ 9
10 $\rightarrow$ 10

FUNCTION only one output
for every input.

2.

X	1	2	4	2	9
y	0	4	10	10	3

INPUT   OUTPUT

1 $\longrightarrow$ 0
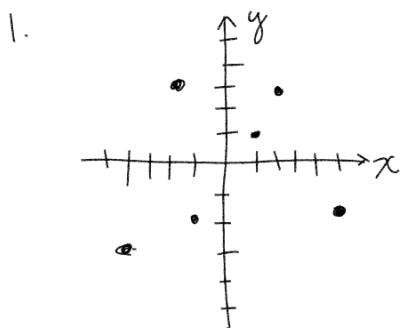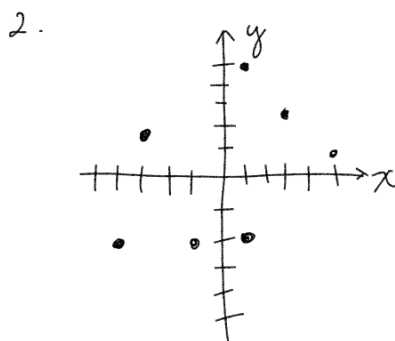2 $\nearrow$ 3
4 $\rightarrow$ 4
9 $\rightarrow$ 10

NOT A FUNCTION

The input 2 has 2 output values

Tell whether the relation in the following graphs is a function:

1.

2.

FUNCTION: passes the
vertical line test

NOT A FUNCTION: Fails
vertical line test

Determine if the following ordered pairs is a solution to the function y = 2x+1

1. $(2, 5)$

$x = 2$
$y = 5$

$y = 2x + 1$
$5 = 2(2) + 1$
$5 = 4 + 1$
$5 = 5$

TRUE

∴ $(2, 5)$ IS A
SOLUTION

2. $(3, 10)$

$x = 3$
$y = 10$

$y = 2x + 1$
$10 = 2(3) + 1$
$10 = 6 + 1$
$10 = 7$

FALSE

∴ $(3, 10)$ IS
NOT A SOLUTION

3. $(0, 1)$

$x = 0$
$y = 1$

$y = 2x + 1$
$1 = 2(0) + 1$
$1 = 0 + 1$
$1 = 1$

TRUE

∴ $(0, 1)$ IS A
SOLUTION

Complete the following ordered pairs to they are a solution to the function y = 4x -3

1. $(4, y)$

$y = 4x - 3$
$y = 4(4) - 3$
$y = 16 - 3$
$y = 13$

$(4, 13)$

2. $(-2, y)$

$y = 4x - 3$
$y = 4(-2) - 3$
$y = -8 - 3$
$y = -11$

$(-2, -11)$

3. $(x, 5)$

$y = 4x - 3$
$5 = 4x - 3$
$\underline{+3 \qquad +3}$
$\dfrac{8}{4} = \dfrac{4x}{4}$
$2 = x$

$(2, 5)$

Graph the following functions:

1. $y = 2x - 1$

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

$x = -2$
$y = 2(-2) - 1$
$y = -4 - 1$
$y = -5$

$x = -1$
$y = 2(-1) - 1$
$y = -2 - 1$
$y = -3$

$x = 0$
$y = 2(0) - 1$
$y = 0 - 1$
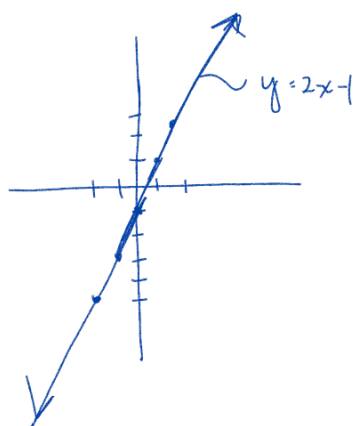$y = -1$

$x = 1$
$y = 2(1) - 1$
$y = 2 - 1$
$y = 1$

$x = 2$
$y = 2(2) - 1$
$y = 4 - 1$
$y = 3$

$y = 2x - 1$

2. $4x + 2y = 10$
$-4x \qquad\qquad -4x$
_____

$\dfrac{2y}{2} = \dfrac{10}{2} - \dfrac{4x}{2}$

$y = 5 - 2x$

x	y
-1	7
0	5
1	3

$x = -1$
$y = 5 - 2(-1)$
$y = 5 + 2$
$y = 7$

$x = 0$
$y = 5 - 2(0)$
$y = 5$

$x = 1$
$y = 5 - 2(1)$
$y = 5 - 2$
$y = 3$

$y = 5 - 2x$