Algebra II **Name:**_____

#1: Analyze the difference between functions and relations.

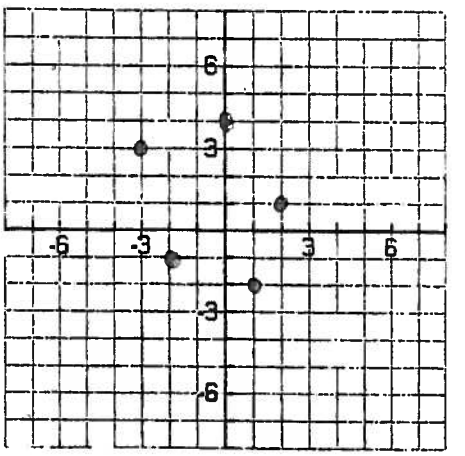
A **relation** is any set of ordered pairs or anything that has a relationship between it.

Three Common Forms of Relations:

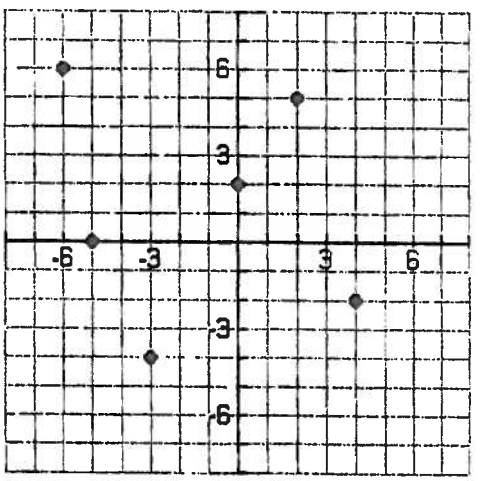
1. Set of Ordered Pairs
2. Graph
3. Mapping Diagram

1. Graph the relation. (Don't connect the dots!)

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

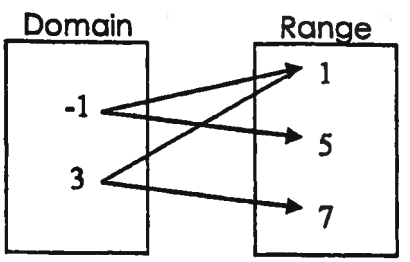


2. Write the ordered pairs for the relation.



(-6, 6)
(-5, 0)
(-3, -4)
(0, 2)
(2, 5)
(4, -2)

3. Write the ordered pairs for the relation.



(-1, 1)
(-1, 5)
(3, 7)
(3, 1)

Algebra II **Name:**_____

#1: Analyze the difference between functions and relations.

A **function** is a special relation. A **function** is a one-to one Relation that establishes a relationship between two numbers.

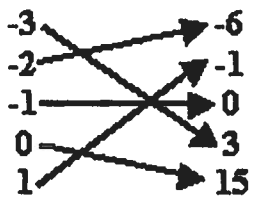
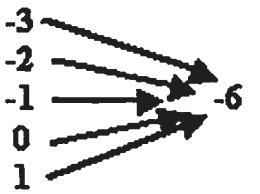
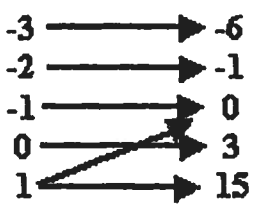
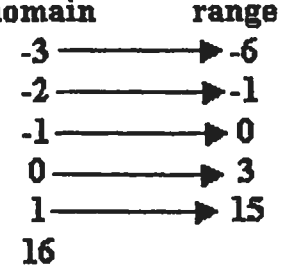
For every input there is exactly one output.

The collection of all the inputs is called the Domain of a function.

The collection of all the outputs is called the Range of a function.

Go back to #1-3 on your notes and identify the domain and range of each relation.

Every number in the domain must match up to **exactly** one number in the range.
Are the following examples of functions or relations? Explain your reasoning.

	yes one to one
	yes one to one
	NO (1, 0) (1, 15) → not one output
	NO 16 does not have an output

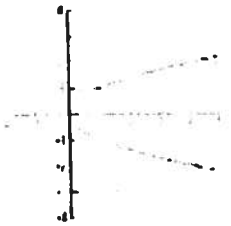
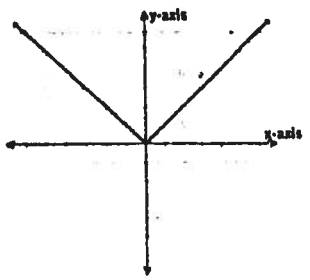
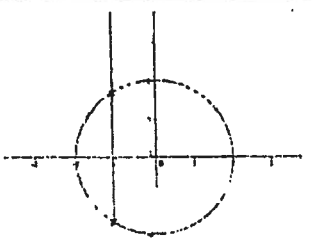
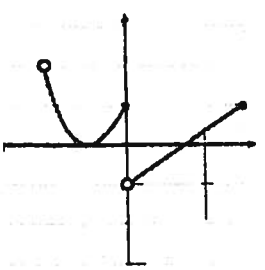
Algebra II **Name:**_____

#1: Analyze the difference between functions and relations.

In the previous example, we looked at mapping diagrams. What if we have a picture instead? When given a graph, we will use the **Vertical Line Test** to decide if it is a function.

If a vertical line hits the graph **once**, it is a **function**.
If a vertical line hits the graph **more than once**, it is **not** a function.

Are the following examples of functions or relations? Explain your reasoning.

	No Does not pass VLT
	yes Hits once
	No Does not pass VLT
	Yes only hits once ● ← hits ○ ← not hitting

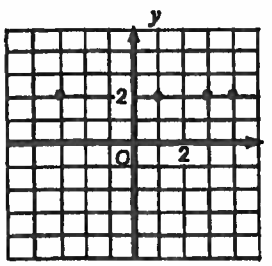
Just remember:
A function **may not** have two y-values assigned to the same x-value, such as {(2,4), (2,6)}.
A function may, however, have two x-values assigned to the same y-value, such as {(2,4), (3,4)}.

Algebra II **Name:**_____

#1: Analyze the difference between functions and relations.

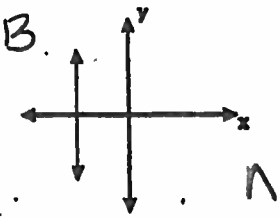
Sort the boxes below into functions and not functions. For each one that is not a function, write a short reason why it cannot be a function.

A



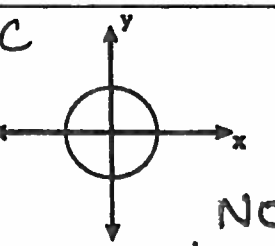
yes
one to one

B



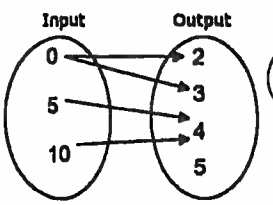
NO
does not pass VLT

C



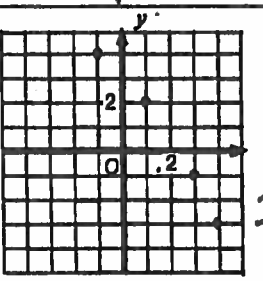
NO
does not pas VLT

D



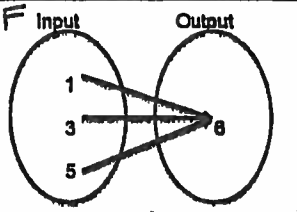
NO
(0, 2)
(0, 3)

E



yes
1:1

F



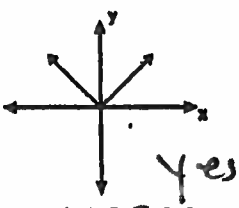
yes one to one

G

{(-1, 5), (2, 4), (2, 5) (8, 5)}

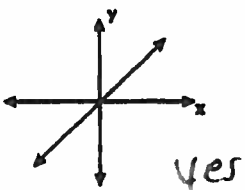
NO
(2, 4) not one to one
(2, 5)

H



yes
passes VLT

I



yes
passes VLT

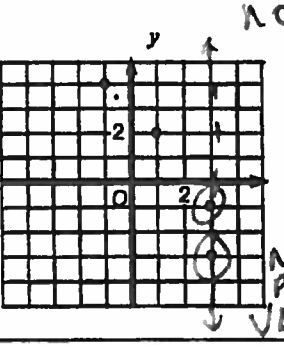
J

{(-1, 5), (2, 5), (3, 5) (8, 5)}

yes
one to one

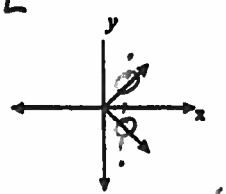
K

NO



not passing VLT

L



NO
not passing VLT