A **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is a *rule* which relates **each element** of a set with **exactly one** element of another set. In other words, it relates an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

repeat

output (y)

input (x)

function

 This means that none of the x-values can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Determining if a relation is a function. (just make sure an x does not repeat!)

 Ordered Pairs:

Ex 1) {(3, 4),(0,3), (1,8), (0,2)} Check: Do any of the x-values repeat? If they do, it is NOT a function!!

 Is it a function? \_\_\_\_\_\_\_\_

Ex 2) {(8, 3),(2,7),(1,2),(5,3)} Check: Do any of the x-values repeat? If they do, it is NOT a function!!

 Is it a function? \_\_\_\_\_\_\_\_

 Tables:

|  |  |  |  |
| --- | --- | --- | --- |
| X | 2 | 5 | 9 |
| Y | 13 | 9 | 13 |

Ex 3) Check: Do any of the x-values repeat? If they do, it is NOT a function!!

 Is it a function? \_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| x | Y |
| 2 | 4 |
| 5 | 7 |
| 2 | 9 |

Ex 4) Check: Do any of the x-values repeat? If they do, it is NOT a function!!

 Is it a function? \_\_\_\_\_\_\_\_\_

 Mappings:

Ex 4) To determine if a mapping is a function: Each x value can only be used ONCE!!!

2

4

6

1

5

 Is it a function? \_\_\_\_\_\_\_\_

Ex 4) To determine if a mapping is a function: Each x value can only be used ONCE!!!

5

3

8

4

1

 Is it a function? \_\_\_\_\_\_\_\_

 Graphs:

Another way to determine if a relation is a function: **Vertical Line Test**

Vertical line

On a graph, it is a function if a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ would ever cross the graph \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

only one time



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Some Examples of Functions**

 **x2** is a function

 **5x – 6** is a

 function

 **x3+1** is a function

Verbal Descriptions:

To decide if a verbal description of a relation is a function: “Does each ***x*** have only ONE ***y***?”

Ex 6) (state, capital) Check: Does each state have only ONE capital? Is it a function?\_\_\_\_\_\_\_\_\_

Ex 7) (state, city) Check: Does each state have only ONE city? Is it a function?\_\_\_\_\_\_\_\_\_

Create examples of functions and non-functions!

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ordered Pairs(\_\_\_,\_\_\_\_),(\_\_\_\_,\_\_\_\_),(\_\_\_,\_\_\_\_),(\_\_\_\_,\_\_\_\_)Functions-> | Table

|  |  |  |  |
| --- | --- | --- | --- |
| x |  |  |  |
| y |  |  |  |

 | Mapping | Graph |
| Ordered Pairs(\_\_\_,\_\_\_\_),(\_\_\_\_,\_\_\_\_),(\_\_\_,\_\_\_\_),(\_\_\_\_,\_\_\_\_) Not Functions-> | Table

|  |  |  |  |
| --- | --- | --- | --- |
| x |  |  |  |
| y |  |  |  |

 | Mapping | Graph |

Is it a function? Write YES or NO in each blank

1. 2.

3. {(3, 5),(1, 5), (9, 5), (0, 5)} \_\_\_\_\_\_ 4. {(0, 0), (2, 2), (4, 4)} \_\_\_\_\_\_

b.

a.

|  |  |
| --- | --- |
| month | height |
| March | 5’8” |
| April | 5’10” |
| June | 5’4” |
| March | 5’5” |

5. 6.

d.

c.

b.

a.