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

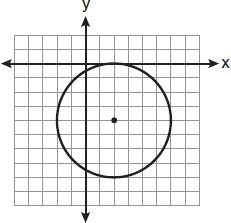
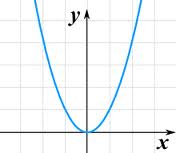
1

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

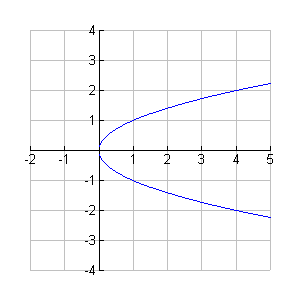
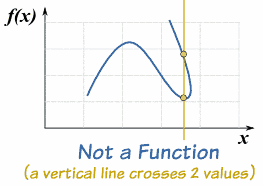
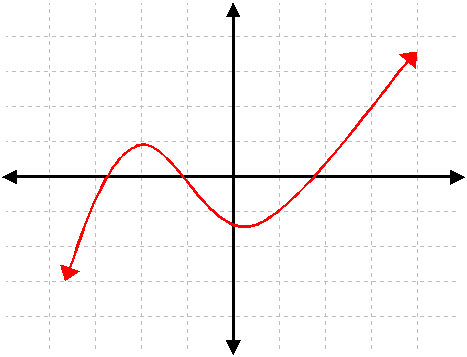
Graphs:

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

Vertical line

[](http://images.google.com/imgres?q=functions&start=158&num=10&hl=en&biw=1366&bih=673&tbm=isch&tbnid=hyqviEhvtcrUBM:&imgrefurl=http://www.mathsisfun.com/sets/functions-common.html&docid=zpyDSPYoAZm7ZM&imgurl=http://www.mathsisfun.com/sets/images/function-square.gif&w=220&h=192&ei=d1t_UJLaHMf62AXt_oGIAg&zoom=1&iact=hc&vpx=481&vpy=332&dur=1049&hovh=153&hovw=176&tx=64&ty=98&sig=105114734256487913143&page=7&tbnh=149&tbnw=171&ndsp=24&ved=1t:429,r:59,s:100,i:181)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***?”

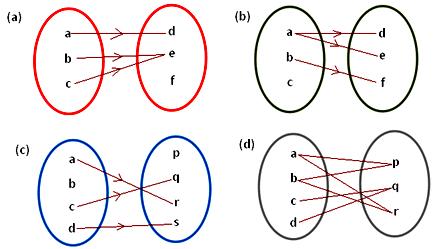
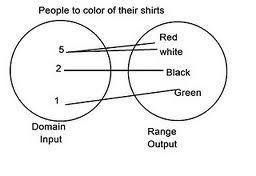
Ex 6) (state, capital) Check: Does each state have only ONE capital? Is it a function?\_\_\_\_\_\_\_\_\_

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

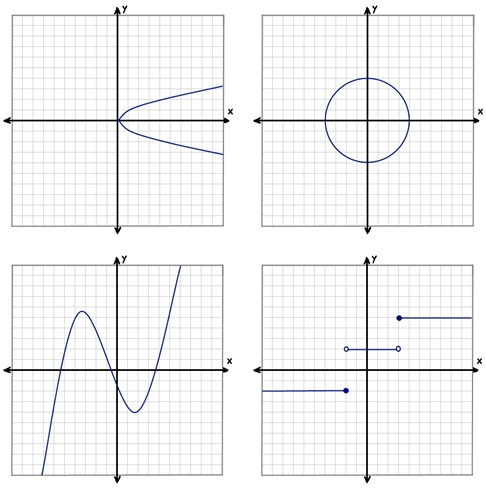
[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=IDDyxYiFUu8JnM&tbnid=WEfgvXBY73gm2M:&ved=0CAUQjRw&url=http://www.math-only-math.com/worksheet-on-functions-or-mapping.html&ei=uQHuUaTgNJT89gS8m4CoCg&psig=AFQjCNFO8dwkxxWj7f7hMhl3O6WKhFHZ3w&ust=1374638872806106)[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=yJO0xfTSKnSj8M&tbnid=CHBAm7wsAUn0jM:&ved=0CAUQjRw&url=http://rationalexpressions.blogspot.com/2013/03/is-this-function.html&ei=PQTuUZXzF4nW9QTwmIDoCg&psig=AFQjCNEKi1jRrm5m1SrAgZ3mrVTavJlzFQ&ust=1374639293175594)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” |

[](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=UT7DnsrNZqg_xM&tbnid=bUx-LLaML5mLdM:&ved=0CAUQjRw&url=http://acemymathcourse.com/function-or-not-a-function/&ei=XwXuUZm4A4-68wSSxIHwCA&psig=AFQjCNETix2zTYKzzD3tv2dk5uWeWbq_wA&ust=1374639818938887)5. 6.

d.

c.

b.

a.