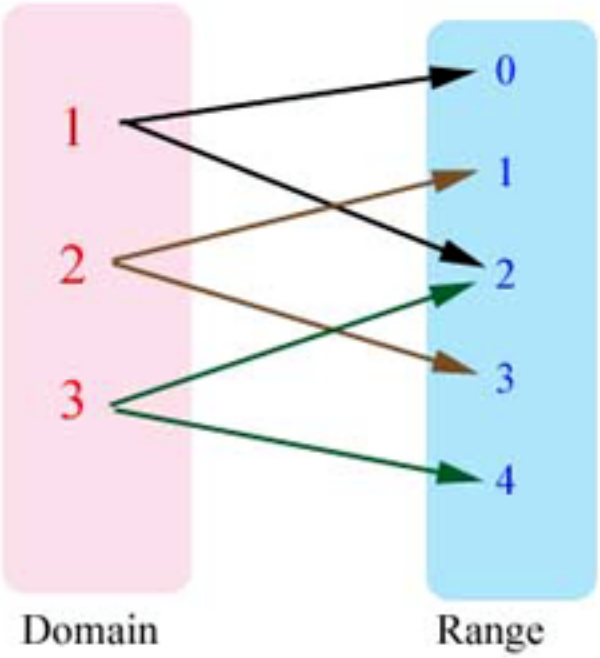
A ***relation*** is a set of ordered pairs. The set of first coordinates in the ordered pairs is the ***domain*** of the relation, and the set of second coordinates is the ***range.***

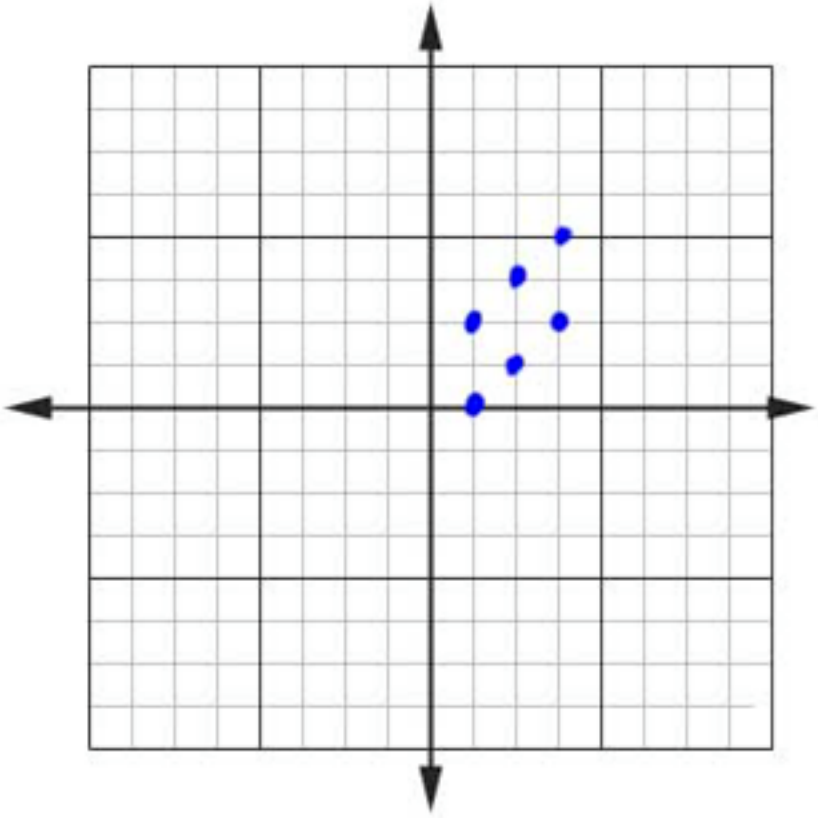
A ***mapping diagram*** shows the correspondence between the Domain and the Range.



Relations can also be described by listing the ordered pairs in the set. For this example it would be:

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

The set of ordered pairs in a relation could also be represented graphically.



A ***function*** is a relation in which each member of the Domain is matched with exactly one menber of the Range.

Another way to say this is that a ***function*** is a relation in which each of the ordered pairs have different first coordinates.

Clausen says that a ***function*** is a relation in which there is no repetition of x-values (abscissas) in the Domain.

Ex 1) Tell whether this set of ordered pairs is just a relation whether it is a function.

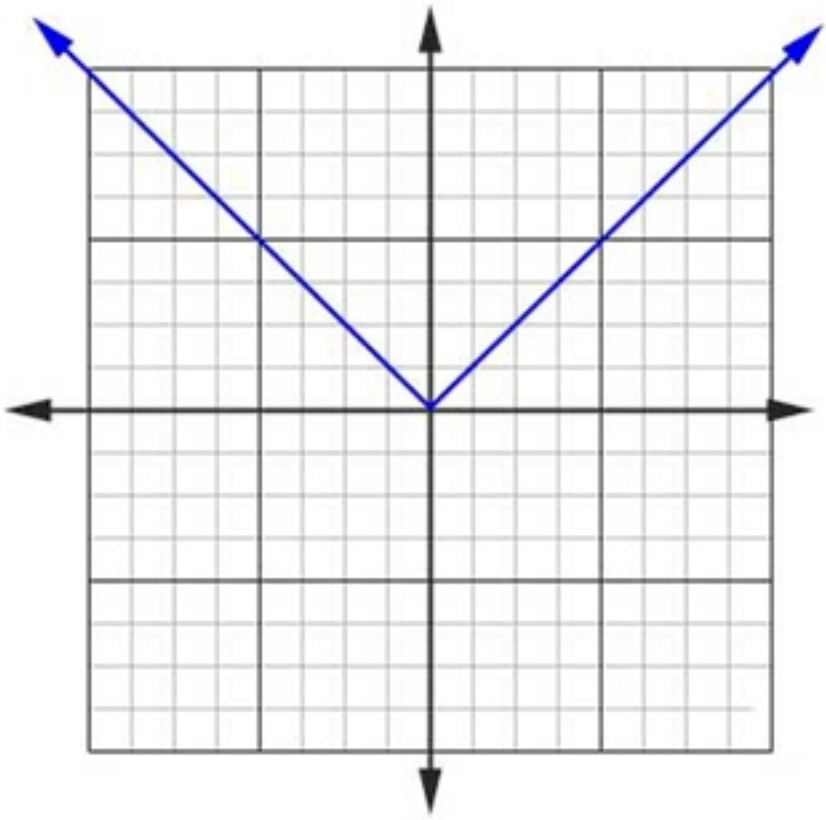
{(9, 1), (-5, -2), (2, -1), (3, -9)}

Function

The Vertical Line Test for Functions

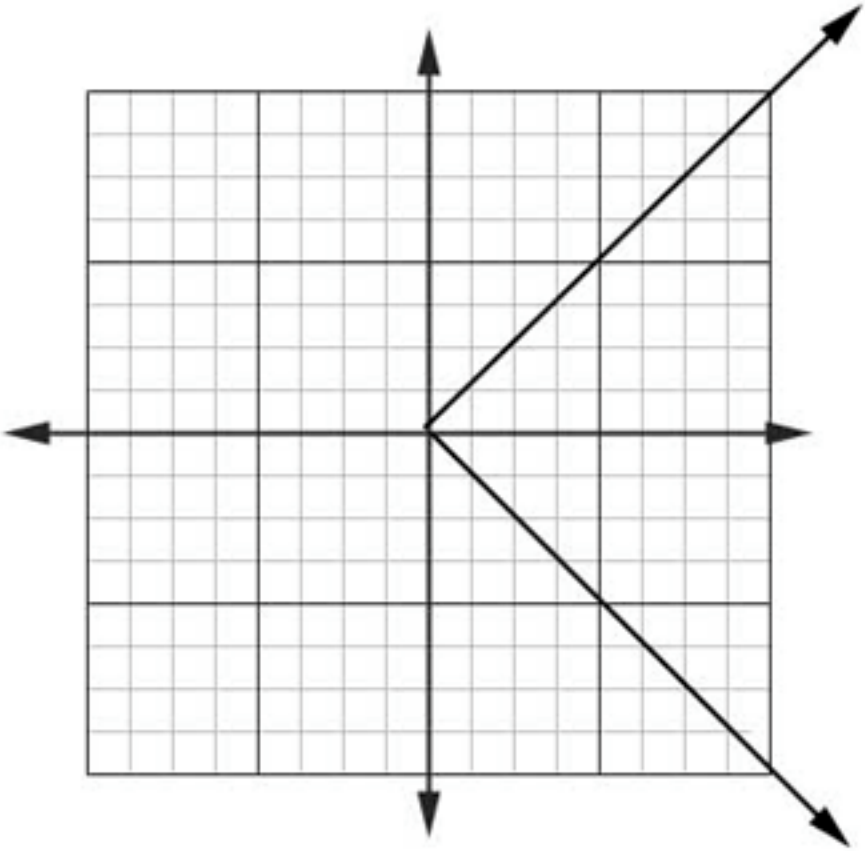
If it is possible for a vertical line to intersect a graph at more than one point, then the graph is not a function.

Ex 2) Does the following graph represent a function?



yes, because it passes the Vertical Line Test

Ex 3) Does the following graph represent a function?



No

Ex 4) Give the domain and range for the relation and tell whether it is also a function.

{(2, 3), (4, 3) (1, 2), (3, 4), (5, 6)}

Domain = {1, 2, 3, 4, 5}

Range = {2, 3, 4, 6}

The relation above is a function.