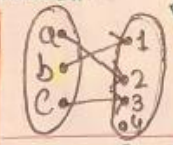
FUNCTION

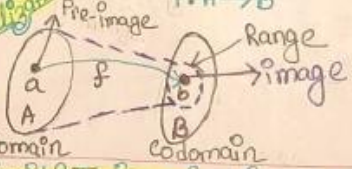
DEFINITION

Let A and B be non-empty sets. A function f from A to B is an assignment of element of A. We write $f(a) = b$ if b element of B to each element is unique element of B assigned by the function f to each element a of A. If f is a function from A to B. We write $f: A \to B$. Functions are sometimes also called mapping or transformation.

Example of a function.



Visualization



$f: A \to B$

TYPES

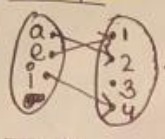
There are many types of functions. They are: 1) one-to one 2) Onto 3) Ceiling 4) Floor, etc.

ONE TO ONE

A function f from A→B is called one to on, if whenever $f(a) = f(b)$, then $a = b$, No element of B is the image of more than one element in A.

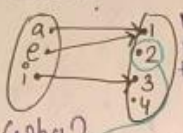
- A function is said to be injective if it's one to one function.

Example



→ one to one function

Is it an one-to-one function?



No, it's not an one-to one function.

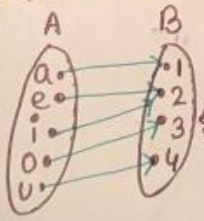
Why? more than one element is paired with a in the codomain.

ONTO

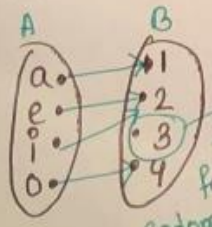
A function f from A to B is called onto if, for all 'b' in B, there is an 'a' in A, such that $f(a) = b$ All elements in B are used.

- A function is said to be subjective if it is onto function.

Example



→ it is an Onto funtion because all the element in B are used



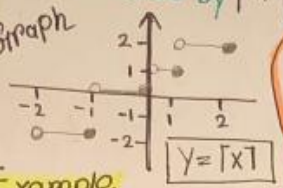
Because of this it is not an Onto function because all four elements in the codomain are not the images of every element in the domain

CEILING FUNCTION

The ceiling function assigns to the real number x the smallest integer that is greater than or equal to x.

- The value of the ceiling function at x denoted by $\lceil x \rceil$.

Graph



Example

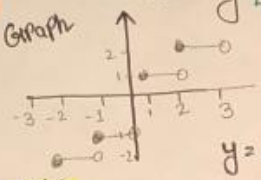
$\lceil x \rceil$ ceiling function: the smallest integer $\geq x$

1) $\lceil 2.3 \rceil = 3$
2) $\lceil 7 \rceil = 7$
3) $\lceil \frac{1}{2} \rceil = 1$

FLOOR FUNCTION

The floor function assigns to the real number x, the largest integer that is less than or equal to x. The value of the floor function at x is denoted by $\lfloor x \rfloor$

Graph



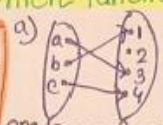
Examples

$\lfloor x \rfloor$ Floor function: the largest integer $\leq x$

1) $\lfloor 2.3 \rfloor = 2$ 2) $\lfloor 2 \rfloor = 2$
3) $\lfloor 0.5 \rfloor = 0$ 4) $\lfloor -3.5 \rfloor = -4$

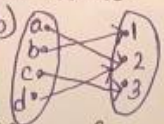
Which function is it? Is it a function or not?

a)



one to one function but not onto because all the elements in B are not use.

b)

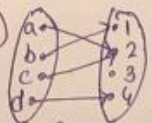


it is Onto fnc but en not one to one because more than one element is paired with element 2 in the codomain.

c)

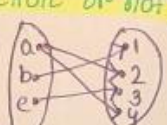
It is both one to one and onto.

d)



It is neither onto nor one to one fnc because all four element in the codomain not the images of every element in the domain, so it is not onto function. Not one to one because more than one element is paired in the codomain.

e)



it is not a ~~functio~~ function because it sends an element to two different element.