Functions

A function is mapping from a non-empty set A
to a non-empty set B

Denoted by $f : A \to B$

each element in A maps to exactly one element in B

Given $f : A \to B$

A is called the **domain** of f

B is called the **codomain** of f

f is called real-valued if B is the real numbers

f is called integer-valued if B is the integers
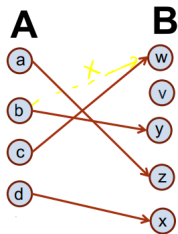
If f(a) = b

then b is called the **image** of a under f.

a is called the **preimage** of b.

The **range** of f, denoted $f(A)$ is the set of
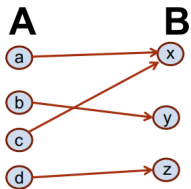all images of points in A under f.

Injective (One-To-One) Functions

f is is **injective**, if and only if for all a and b
in the domain of f, if f(a) = f(b) then a = b.

Surjective (Onto) Functions

f is **surjective** if and only if for every element
$b \in B$ there is an element $a \in A$ such that f(a) = b

Bijective Functions

both injective and surjective