Functions

Commonly used functions

Definition

A function x with domain $\mathbb{N}$ is called an *infinite sequence*, or simply a *sequence*. The image of $n \in \mathbb{N}$ is usually written x_n instead of $x(n)$ and is called the nth *term of the sequence*.


UCDAVIS
AGGIES

Constructions of functions

Given functions $f : A \to B$ and $g : B \to C$, the *inverse of* f is the relation from B to A

$$f^{-1} = \{(x, y) : (y, x) \in f\},$$

and the *composite of* f *and* g is the relation from A to C

$$g \circ f = \{(x, z) : \exists y \in B \text{ s.t. } (x, y) \in f \text{ and } (y, z) \in g\}.$$

Theorem (4.2.1)

Let A, B and C be sets, and let $f : A \to B$ and $g : B \to C$. Then $g \circ f$ is a function from A to C, and $Dom(g \circ f) = A$.


UCDAVIS
AGGIES

Theorem (4.2.2)

Let A, B, C and D be sets, and let $f : A \to B$, $g : B \to C$, and $h : C \to D$. Then $(h \circ g) \circ f = h \circ (g \circ f)$.


UCDAVIS
AGGIES