



## Why

The relationship between the inclusion map and the identity map is characteristic of making small functions out of large ones.

## Definition

Let  $X \subset Y$  and  $f : Y \rightarrow Z$ . There is a natural function  $g : X \rightarrow Z$ , namely the one defined by  $g(x) = f(x)$  for all  $x \in X$ . We call  $g$  the *restriction* of  $f$  to  $X$ . We call  $f$  an *extension* of  $g$  to  $Y$ . Clearly, there may be more than one extension of a function

## Notation

We denote the restriction of  $f : Y \rightarrow Z$  to the set  $X \subset Y$  by  $f|X$ .

## Example

A simple example is the that the inclusion mapping from  $X$  to  $Y$  with  $X \subset Y$  is a restriction of the identity map on  $X$



