

# What are functions?

Rosen, Chapter 2.3 (pp. 138-155).

Functions are mappings from one set to another!

The notation  $f : X \rightarrow Y$  means:

- ▶  $f$  is a function from  $X$  to  $Y$
- ▶ You can think of  $f$  as an algorithm with input coming from  $X$  and output in  $Y$
- ▶ The output of  $f$  on input  $x$  is denoted  $f(x)$
- ▶ In other words  $f(x)$  has a value in  $Y$  for each element  $x \in X$
- ▶ Also,  $f(x)$  never has two values in  $Y$  for any  $x \in X$
- ▶  $X$  is referred to as the “domain” of  $f$  and  $Y$  is referred to as the “co-domain” of  $f$ .
- ▶ The subset of  $Y$  defined to be  $\{y \in Y \mid \exists x \in X \text{ s.t. } f(x) = y\}$  is called the “range” of  $f$ .