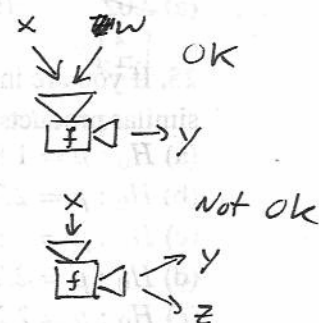
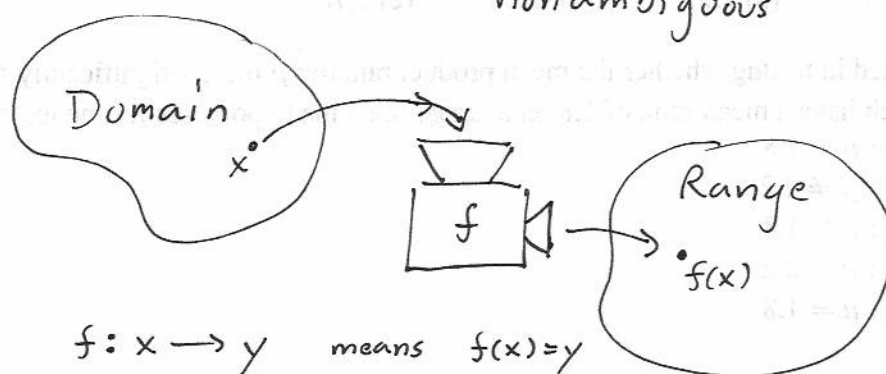


1.1 Functions & Change

A function can be thought of as a machine which transforms one thing into another thing
 (domain element) (range element)
 It is consistent and ~~nonambiguous~~ nonambiguous.



Examples:

1. $f(\text{element}) \Rightarrow \# \text{ of protons}$
2. $f(\text{person}) = \text{ssn}$
3. $f(\text{time}) = \text{your altitude}$
4. $f(x) = x^2 - 1$
5. $f\left(\frac{p}{q}\right) = \frac{q}{p}$

Nonexamples:

- element $\rightarrow \# \text{ of electrons}$
 person $\rightarrow \# \text{ of protons}$
 person $\rightarrow \text{telephone \#}$

~~$\frac{x}{y} \mapsto \frac{x+y}{y}$~~

~~$\frac{p}{q} \mapsto p - q$~~

Domain = set of things the function eats
 Range = set of things the function produces.

- $\rightarrow$ 1. Domain = all elements Range = integers from 1 to 118
 2. Domain = all people with ssn #'s Range = set of all ssn #'s
 3. Domain = every second since born R = all altitudes you will have had.
 $\rightarrow$ 4. Domain = all real #'s $(-\infty, \infty)$ R = all real #'s ≥ -1 $[-1, \infty)$
 $\rightarrow$ 5. D = all nonzero #'s R = all nonzero #'s.