

Functions

math class

$$f: \mathbb{R} \rightarrow \mathbb{R}$$

"f is a function
from real #'s to real #'s"

$$x \mapsto x^2 + 1$$

OR

$$f(x) = x^2 + 1$$

C++

```
double f(double);
```

"

"

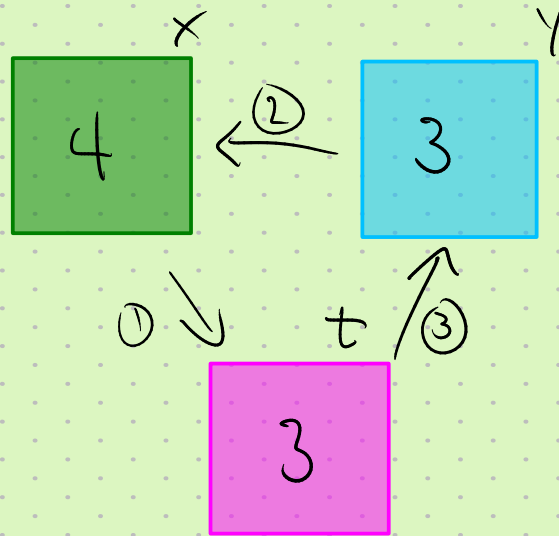
```
double f(double x)
{
    double y = x*x + 1;
    return y;
}
```

key differences with math functions:

- functions might be "multi valued" or non-deterministic.

- might have useful side-effects (e.g. printing to stdout)

Swap function:



$t = x;$ // ①

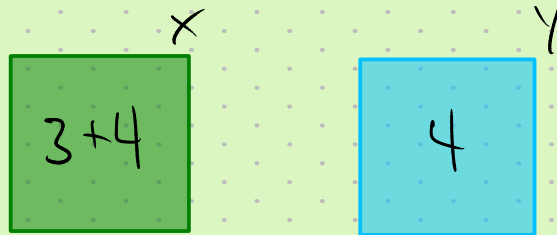
$x = y;$ // ②

$y = t;$ // ③

Is t necessary?

$x = y = x;$ \equiv $x = (y = x);$

What about arithmetic?
or algebra?



$x + = y$