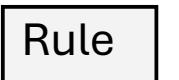
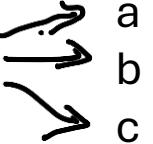


Functions , mathematical kind

- A **relation** that gives exactly **one unique output for each input**

$x \rightarrow$  y :this is a function as you always get one answer

$x \rightarrow$   a b c :Not a function as you get multiple answers

- Representation
 - $f(x) = 2x+1$:this is a function
 - $g(x) = \pm 3x$:this is **not** a function , why?
- Follow up reading (optional): pg 11-13 : [functions](#)

Evaluating functions

- Solving
 - Substitute variables with numerals
 - Evaluate
 - Follow PEMDAS/BODMAS
- Solve for $x = 0, 1, 2, 3$
 - $f(x) = 3x + 1$
 - $g(x) = 2x^2 + 3$
 - $h(x) = x^2 + 2x + 1$

Recursive Functions

- Functions calling themselves

Fibonacci numbers	$fib: \mathbb{N} \rightarrow \mathbb{N}$ $fib(n) = \begin{cases} 0, & \text{if } n = 0 \\ 1, & \text{if } n = 1 \\ fib(n - 1) + fib(n - 2), & \text{if } n \geq 2. \end{cases}$
Factorial	$\mathbf{fact(n) = n * fact(n-1)}$ $\{\text{given, } fact(1) = fact(0) = 1\}$
Lucas numbers <i>(same rule as Fibonacci but with different starting values)</i>	$\mathbf{l(n) = l(n-1) + l(n-2)}$ $\{\text{given, } l(0) = 2, l(1) = 1\}$

- Evaluate for ‘n’ = 2 , 4, 5, 6
- Follow up reading (optional): [nested functions visualized](#)

Programming, , Test #1

- Need to know
 - Data types
 - Conditionals : If/else
 - Loops : for
 - Arrays : 2 dimensional
- Practice
 - Arrays- DS (Hackerrank)
 - Do the 4 problems marked “easy”
 - Optional :“hard”, “medium” one are for extra challenge