

# **Factorization**

## **Arabic Animated**

### **intuition**



## Factorization

what's the factor ?

A factor is a number that divides into another number exactly and without leaving a remainder.

in short

$n \% \text{ factor} = 0$

given a number  $n$        $n=36$

find it's factors      factors of 36 : 1 2 3 4 6 9 12 18 36

in programming a simple for loop from 1 to  $n$   
will do the job for us

## Factorization optimization

factor :  $n \% \text{factor} = 0$

factorizatoin : is finding the number's factors

if ( $n \% i == 0$ )

given a number n

find it's factors

if  $n=36$

if  $i==1$  (1 36) 1, 36/1

if  $i==2$  (2 18) 2, 36/2

if  $i==3$  (3,12) 3, 36/3

if  $i==4$  (4,9) 4, 36/4

if  $i==6$  (6,6) 6,36/6

why should i stop at number 6 ?

if i continue i will repeat the factors 9,4 and so on

$6*6=36$  i should always stop at  $\text{sqrt}(n)$