### Theorem: Fundamental Theorem of Arithmetic

This concept refers to aPrime factorization Every natural number the prime numbers prime factorizationp p , i.e., in the form x can be written in a unique way as a product of finitely manyx = p1 · . ·pn. We call the product p1 · . · pn

number being written as

#### a product of all its prime Example: Prime factorization

factors.

The prime factorization of 92 is 9216 = 2 · 2 · = 2 · 2 · 2 · 123456 = 223 2 · 2 · 2 · 2 · 2 · 2 · 3 · 643

The prime factorization of 7 is 7 because it is a prime number.

The prime factorization of 16 is .

The prime factorization of 123456 is .

The following theorem about prime numbers goes back to the famous Greek mathematician Euclid, who lived in Alexandria in the third century BC. It says that there are an infinite number of prime numbers.