### Example: Euler’s function

Let us consider the number 6: it is , ,

5)7)6) = = | = 1216, gcd(5, 5) = 5gcd(5, 7) = 1 and gcd(6, 7) = 1gcd(1, 7) = 1, so φ(7) =gcd(3, 5) = 1

Let us consider the number 7: it is ,

, ,

6} = .

Let us consider the number 5: it is ,

, . Thus .

Examples 2 and 3 illustrate a special property of Euler’s function: For each prime num-

ber p, it applies that gcd(p, p) = pφ(p) = p − p 1. The reason for this is that a prime number is only a ∈ ℕ 1 ≤ a < p gcd(a,

p) = 1 and .

divisible by 1 and itself, i.e., with , i.e.,

Euler’s φ function also has another important property: it belongs to the set of so-called multiplicative functions. This is what we want to explain in the following theorem.