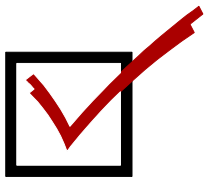
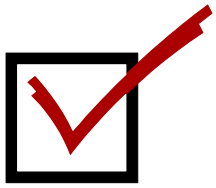
NATURAL NUMBERS



ONE
1



PRIME NUMBERS
2, 3, 5, 7

COMPOSITE NUMBERS
1, 2, 3, 4, 5

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NATURAL NUMBERS

Natural numbers are all of the whole numbers **EXCEPT** zero.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.....

They are separated into three categories.

One, Prime, and Composite.

ONE

The number 1 is considered neither prime nor composite.

PRIME NUMBERS

A prime number is any natural number which is evenly divisible only by itself and one. Number 13 is a prime number since it is not exactly divisible by any number except itself and 1. On the other hand, 57 is not a prime number since it is divisible without a remainder by 3 and 19. The table below includes all the prime numbers from 1 to 100. (Note: Zero (0) is NOT a prime number.)

1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41,

43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 97

One of the easiest ways to determine whether a number is a prime number is to try dividing it evenly by either 2, 3, 5, and 7. Usually, if these numbers fail to divide evenly into the number, it is prime.

The exceptions are the rare instances where the number is only divisible exactly by the number over 10.

Example:

Which of the following numbers is prime? 101, 117, 123, 147

101 is a prime number. 117, 123 and 147 are divisible by 3.

Which of the following numbers is not prime? 59, 71, 123, 143

123 is not a prime number. It is divisible by 3.

PRIME FACTORIZATION

The prime factorization of a number is the expression of the number as a product of its prime factors. To find the prime factor of a number:

Step 1 Divide by the smallest prime number that gives in evenly. Continue dividing the resulting quotients until the division is no longer even.

Step 2 Divide by the next largest prime number that divides evenly. DO NOT SKID AROUND. Test the primes in sequential order (smallest to largest). Keep dividing by the prime number until it no longer divides evenly, then move to the next larger prime number.

Step 3 Continue this process, moving through the primes sequentially, until the remainder is a prime number. Then stop and write the primes in exponential notation.

Example: Prime Factorization of 68. (Tree Method)

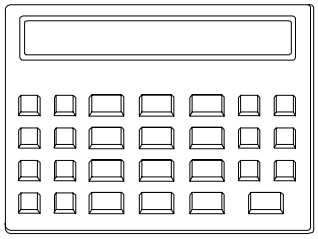
68

↓

$2 \bullet 34$

$2 \bullet 2 \bullet 17$

$68 = 2 \cdot 2 \cdot 17 = 2^2 \cdot 17$



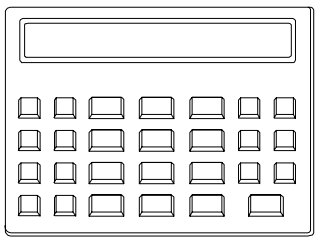
CALCULATOR EXAMPLE

Write the prime factorization of 68. Since 68 is divisible by 2, we begin by dividing by 2.

ENTER	DISPLAY	DISPLAY NUMBER DIVISIBLE BY:
68	68.	2
÷	68.	
2	2.	
=	34.	34
÷ 2 =	17.	2
÷ 17 =	1.	

So, 68 in prime factored form is $2^2 \cdot 17$

PRACTICE EXAMPLE



CALCULATOR EXAMPLE

Write the prime factorization of 118. Since 118 is divisible by 2, we begin by dividing by 2.

ENTER	DISPLAY	DISPLAY NUMBER DIVISIBLE BY:
118	118.	2
÷	118.	
2	2.	
=	59.	59
÷ 59 =	1.	

So, 118 in prime factored form is $2 \cdot 59$

COMPOSITE

A composite number is any natural number which is evenly divisible by a number other than 1 or itself. No number is both prime and composite.

Example: 25 is composite because it is evenly divisible by 5.

42 is composite because it is evenly divisible by 2 and 3.

5,421 is composite because it is evenly divisible by 3.

PRIME FACTORING

Even composite numbers can be written as a product of prime factors.

Composite 15

Prime Factors $3 \cdot 5$