



Gymnázium, Brno, Slovanské nám. 7

WORKBOOK

<http://agb.gymnaslo.cz>



Subject: Mathematics

Student:

School year:/.....

Topic: Divisibility rules

A whole number n is divisible by another number m if the division n / m yields a remainder equal to 0. m is called the factor of n .

Dividing by 2

1. All even numbers are divisible by 2. E.g., all numbers ending in 0,2,4,6 or 8.



Dividing by 3

1. Add up all the digits in the number.
2. Find out what the sum is. If the sum is divisible by 3, so is the number
3. For example: 12123 ($1+2+1+2+3=9$) 9 is divisible by 3, therefore 12123 is too!

Dividing by 4

1. Are the last two digits in your number divisible by 4?
2. If so, the number is too!
3. For example: 358912 ends in 12 which is divisible by 4, thus so is 358912.

Dividing by 5

1. Numbers ending in a 5 or a 0 are always divisible by 5.

Dividing by 6

1. If the Number is divisible by 2 and 3 it is divisible by 6 also.

Dividing by 8

1. This one's not as easy, if the last 3 digits are divisible by 8, so is the entire number.
2. Example: 6008 - The last 3 digits are divisible by 8, therefore, so is 6008.

Dividing by 9

1. Almost the same rule and dividing by 3. Add up all the digits in the number.
2. Find out what the sum is. If the sum is divisible by 9, so is the number.
3. For example: 43785 ($4+3+7+8+5=27$) 27 is divisible by 9, therefore 43785 is too!

Dividing by 10

1. If the number ends in a 0, it is divisible by 10.

Example 1: Determine whether 7,168 is divisible by 2, 3, 4, 5, 6, 8, 9 and 10.

Example 2: Is the number 593 prime or composite? Use divisibility when possible to find your answer.

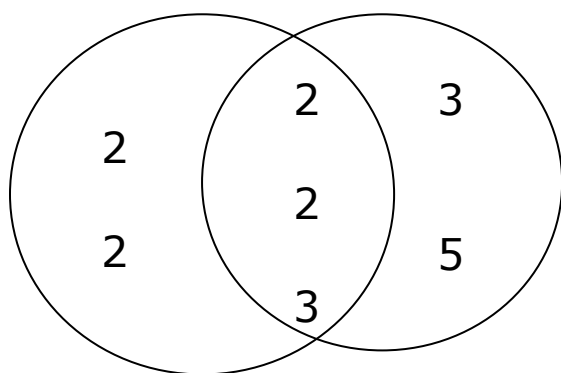


The least common multiple – LCM

of two integers a and b , usually denoted by $\text{LCM}(a, b)$, is the smallest positive integer that is a multiple of both a and b

It is also called the **lowest common multiple** or **smallest common multiple**

Find the **prime factorization** of each of the two numbers. Put the prime factors into a Venn diagram with one circle for each of the two numbers, and *all* factors they share in common in the intersection. To find the LCM, just multiply all of the prime numbers in the diagram.



Here is an example:

$$48 = 2 \times 2 \times 2 \times 2 \times 3,$$
$$180 = 2 \times 2 \times 3 \times 3 \times 5,$$

and what they share in common is two "2"s and a "3":

$$\text{Least common multiple} = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 720$$

The greatest common divisor – gcd

The greatest common divisor of two or more non-zero integers, is the largest positive integer that divides the numbers without a remainder.

For example, *the GCD of 8 and 12 is 4.*

Here is another concrete example, illustrated by a Venn diagram. Suppose it is desired to find the greatest common divisor of 48 and 180. First, find the prime factorizations of the two numbers:

$$48 = 2 \times 2 \times 2 \times 2 \times 3,$$
$$180 = 2 \times 2 \times 3 \times 3 \times 5.$$

What they share in common is two "2"s and a "3":

Greatest common divisor = $2 \times 2 \times 3 = 12$.

