Greatest common factor

A common factor of two positive whole numbers is a number that divides evenly into both of them. Their greatest common factor (sometimes abbreviated GCF) is the largest number that divides evenly into both of them. Another name that's used for "greatest common factor" is "greatest common divisor" (sometimes abbreviated GCD).

One way to find the greatest common factor of two positive whole numbers is to find the prime factorizations of both numbers and then to look for the factors that appear in both factorizations.

Example

Find the greatest common factor of 14 and 28.

In order to find the greatest common factor, we need to look for the largest number that divides evenly into both 14 and 28.

To do this, we'll break down number into its prime factors.

14

$2 \cdot 7$

28

$2 \cdot 14$

$2 \cdot 2 \cdot 7$

The factor of 2 appears once in 14 and twice in 28, so we'll have one factor of 2 in the greatest common factor. The factor of 7 appears once in 14 and

once in 28, so we'll have one factor of 7 in the greatest common factor. Therefore, the greatest common factor of 14 and 28 is $2 \cdot 7$. Multiplying this out, we get $2 \cdot 7 = 14$, which means 14 is the greatest common factor of 14 and 28.

Let's double-check our answer by making sure that 14 divides evenly into both 14 and 28.

$$14 \div 14 = 1$$

$$28 \div 14 = 2$$

It does, so 14 is a common factor of 14 and 28. In fact, 14 is the **greatest** common factor of 14 and 28: When we divide 14 and 28 by 14, we get 1 and 2, respectively, and the only number that divides evenly into both 1 and 2 is 1.

In that example, the greatest common factor 14 was equal to one of the original numbers, but that won't always be the case.