Factors and Multiples Example

Compare 12 and 18 using factors, multiples, GCF, and LCM

WORKED EXAMPLE

A factor divides a number with no remainder. A multiple is the product of a number and an integer. Comparing both lists reveals shared divisors and the first shared positive multiple.

Problem

Find the common factors, greatest common factor, and least common multiple of 12 and 18.

KEY FACT	VALUE
Factors of 12	1, 2, 3, 4, 6, 12
Factors of 18	1, 2, 3, 6, 9, 18
Common factors	1, 2, 3, 6
Common multiples	36, 72, 108, ...

Step-by-step solution

1. List the factors

Factor pairs show every positive divisor. Compare the two lists and keep the values that occur in both.

12: 1, 2, 3, 4, 6, 12; 18: 1, 2, 3, 6, 9, 18

2. Find the GCF

The common factors are 1, 2, 3, and 6. The greatest of these is the greatest common factor.

GCF(12, 18) = 6

3. Find the first common multiple

Multiples of 12 are 12, 24, 36, ...; multiples of 18 are 18, 36, ... The first shared positive value is the LCM.

LCM(12, 18) = 36

4. Confirm with prime factors

Write 12 = 2^2 x 3 and 18 = 2 x 3^2. For the LCM, select the largest exponent of each prime.

LCM = 2^2 x 3^2 = 36

ANSWER

GCF(12, 18) = 6 and LCM(12, 18) = 36.

Check

For positive integers, GCF x LCM equals the product of the inputs: 6 x 36 = 12 x 18 = 216.