

Least Common Multiple

A **multiple** of a number is the product of that number and any whole number.

EXAMPLE List Multiples

1 List the first six multiples of 15.

You can begin a factor tree for 60 in several ways.

$$0 \cdot 15 = 0, 1 \cdot 15 = 15, 2 \cdot 15 = 30, 3 \cdot 15 = 45, 4 \cdot 15 = 60, 5 \cdot 15 = 75$$

The first six multiples of 15 are 0, 15, 30, 45, 60, 75.

The least of the nonzero common multiples of two or more numbers is called the **least common multiple (LCM)** of the numbers. To find the LCM of two or more numbers, you can list the multiples of each number until a common multiple is found, or you can use prime factorization.

EXAMPLE Find the LCM

2 Find the LCM of 12 and 18.

METHOD 1 List the multiples.

multiples of 12: 0, 12, 24, **36**, 48, ...

multiples of 18: 0, 18, **36**, 72, 90, ...

The LCM of 12 and 18 is 36.
Remember that the LCM is a *nonzero* number.

METHOD 2 Use prime factorization.

$$\begin{array}{r} 12 = 2 \cdot 2 \cdot 3 \\ 18 = 2 \cdot 3 \cdot 3 \\ \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ \quad 2 \cdot 2 \cdot 3 \cdot 3 \end{array}$$

Write the prime factorization of each number.

Multiply the factors, using the common factors only once.

The LCM is $2 \cdot 2 \cdot 3 \cdot 3$ or 36.