

If you have ever been shopping, you likely know all about fractions. Sales banners often use fractions because the values of fractions are easy to understand. Somehow, “ $\frac{1}{2}$ off!” resonates with bargain hunters immediately. Fractions are a tidy way of expressing part of a whole number or set of numbers and look neater than writing out a string of digits after a decimal point. The top number of the fraction, called the numerator, tells you how many units you have, while the bottom number of the fraction, called the denominator, tells you how many units are in a complete set.

You can view a fraction as a division problem that has been paused. If you finish the problem, you will end up with the decimal value of the fraction. For instance, $\frac{4}{5}$ is the same as $4 \div 5$ —both equal 0.8. Improper fractions are top-heavy fractions in which the numerator is larger than the denominator. An improper fraction can also be stated as a mixed number, which is a whole number followed by a fraction. For example, $\frac{3}{2}$ is an improper fraction that can be stated as the mixed number $1\frac{1}{2}$. Fractions with identical numerators and denominators equal 1 and are normally written as 1.

When working with a fraction, you can often simplify the fraction to place smaller numbers in the numerator, or top number, and denominator, or bottom number, of the fraction. Smaller numbers generally make fractions easier to work with. For example, the fraction $\frac{1}{4}$ is much easier to understand and work with than $\frac{12}{48}$, even though both fractions have the same value.

To simplify a fraction, you find a number that divides evenly into both the numerator and denominator of the fraction and then divide both parts of the fraction by that number. The most efficient method of simplifying a fraction is

to determine the largest number that evenly divides into both the numerator and the denominator—known as the greatest common factor. When you divide both the numerator and denominator by the same number, the value of the fraction does not change.

Most teachers will not consider an answer complete if it contains a fraction that is not completely simplified. Keep in mind, though, that you will sometimes encounter fractions that cannot be simplified further. For example, the fraction $\frac{73}{91}$ cannot be simplified, since there are no numbers that divide evenly into both parts of the fraction.

About Fractions

Parts of a Fraction

$\frac{\text{Numerator}}{\text{Denominator}}$

Types of Fractions

Proper Fraction Examples

$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}$

Improper Fraction Examples

$\frac{3}{2}, \frac{4}{3}, \frac{5}{4}, \frac{6}{5}, \frac{7}{6}, \frac{8}{7}$

Mixed Number Examples

$1\frac{1}{2}, 2\frac{3}{4}, 3\frac{1}{5}, 4\frac{2}{3}, 5\frac{3}{5}, 6\frac{4}{7}$

Examples of Simplified Fractions

$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}$

Examples of Unsimplified Fractions

$\frac{2}{4}, \frac{4}{6}, \frac{9}{12}, \frac{8}{10}, \frac{15}{18}, \frac{24}{28}, \frac{14}{16}, \frac{64}{72}, \frac{81}{90}$

$$\frac{50}{60} = \frac{50 \div 10}{60 \div 10} = \frac{5}{6}$$

$$\frac{24}{30} = \frac{24 \div 2}{30 \div 2} = \frac{12}{15} = \frac{12 \div 3}{15 \div 3} = \frac{4}{5}$$

$$\frac{12}{60} = \frac{12 \div 2}{60 \div 2} = \frac{6}{30} = \frac{6 \div 6}{30 \div 6} = \frac{1}{5}$$

- A fraction has two parts. The top number of a fraction is called the numerator. The bottom number of a fraction is called the denominator.

- A fraction is a division problem written with a fraction bar (—) instead of with a division sign (\div). For example, you can write $3 \div 4$ as $\frac{3}{4}$.

- In a proper fraction, the numerator is smaller than the denominator and the value of the fraction is less than one. For example, $\frac{1}{2}$ is a proper fraction.
- In an improper fraction, the numerator is larger than the denominator and the value of the fraction is greater than one. For example, $\frac{3}{2}$ is an improper fraction.

- A mixed number contains both a whole number and a fraction. For example, $1\frac{1}{2}$ is a mixed number.

- A fraction is considered to be in simplified form when you cannot find a number that evenly divides into both the numerator and the denominator of the fraction.

Note: The numerator is the top part of a fraction. The denominator is the bottom part of a fraction.

- A fraction is considered to be in unsimplified form when you can find a number that evenly divides into both the numerator and the denominator of the fraction.

- 1 To simplify, or reduce, a fraction, look for a number that evenly divides into both the numerator and the denominator of the fraction.

- 2 Divide the numerator and denominator of the fraction by the number you found in step 1.

- 3 Repeat steps 1 and 2 until you can no longer find numbers that will evenly divide into both the numerator and the denominator of the fraction.