## LIFFEPAC Math



# MATHEMATICS 706 FRACTIONS: ADDITION AND SUBTRACTION 

## CONTENTS

I. COMMON FRACTIONS ..... 2
Like Denominators ..... 2
Unlike Denominators ..... 12
II. DECIMAL FRACTIONS ..... 30
Concepts ..... 30
Addition and Subtraction ..... 34
Equivalents ..... 41

## Author:

Editor-in-Chief:
Editor:
Consulting Editor:
Revision Editor:

## Sarah R. Baker

Richard W. Wheeler, M.A.Ed.
Robin Hintze Kreutzberg, M.B.A.
Robert L. Zenor, M.A., M.S.
Alan Christopherson, M.S.

$\overline{\text { Alpha Omega Publications }}{ }^{\circledR}$
804 N. 2nd Ave. E., Rock Rapids, IA 51246-1759
© MCMXCVI by Alpha Omega Publications, Inc. All rights reserved.
LIFEPAC is a registered trademark of Alpha Omega Publications, Inc.
All trademarks and/or service marks referenced in this material are the property of their respective owners. Alpha Omega Publications, Inc. makes no claim of ownership to any trademarks and/or service marks other than their own and their affiliates', and makes no claim of affiliation to any companies whose trademarks may be listed in this material, other than their own.

## FRACTIONS: ADDITION AND SUBTRACTION

The word fraction means a portion, a piece, or a part of something. In mathematics, a fraction is a number. It tells what part of a whole is being used. It can be written as a common fraction, such as $\frac{1}{2}$, or as a decimal fraction, such as 0.37.

Both types of fractions are used constantly in everyday life. Common fractions may be used to measure yard goods, time, recipe ingredients for cooking, the weight of produce at the supermarket, or the length of a piece of
lumber. The most frequent everyday use of decimal fractions is money. In general, decimal fractions are used for more exact measurements, such as medicine, precious gems or metals, mileage, or scientific data.

All fractions can be added or subtracted, and many methods for doing so exist. The methods selected for use in this LIFEPAC ${ }^{\circledR}$ are the ones you should find the easiest to understand and the least complicated to perform.

## OBJECTIVES

Read these objectives. The objectives tell you what you will be able to do when you have successfully completed this LIFEPAC.

When you have finished this LIFEPAC, you should be able to:

1. Add and subtract common fractions with like denominators.
2. Add and subtract common fractions with unlike denominators.
3. Add and subtract decimal fractions.
4. Convert decimal fractions to common fractions.
5. Convert common fractions to decimal fractions.

Survey the LIFEPAC. Ask yourself some questions about this study. Write your questions here.
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
I. COMMON

FRACTIONS

## OBJECTIVES

When you have completed this section, you should be able to:

1. Add and subtract common fractions with like denominators.
2. Add and subtract common fractions with unlike denominators.

Common fractions are separated into two groups. The first group to be considered in this study are those common fractions that have the same number for the denominator, such as $\frac{7}{8}, \frac{5}{8}, \frac{2}{8}$, and $\frac{1}{8}$. These fractions have like denominators. The second group are those that do not have the same denominator, such as $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$, and $\frac{5}{6}$. These fractions have unlike denominators.

## DEFINITIONS

Common fraction: a fraction with a whole number for the numerator and a whole number other than zero for the denominator.
Numerator: the number over the bar in a common fraction.
Denominator: the number below the bar in a common fraction.
Like denominators: denominators that are the same number.
Unlike denominators: denominators that are different numbers.

## LIKE DENOMINATORS

The shaded area of the first box represents $\frac{2}{7}$ of the total box.
The shaded area of the second box represents $\frac{3}{7}$ of the total box. When added, $\frac{5}{7}$ of the total third box is shaded.

Model 1: $\frac{2}{7}+\frac{3}{7}=\frac{5}{7}$ (Note that the denominators are the same. These fractions have like denominators of 7.)
The shaded area of the first circle represents $\frac{4}{5}$ of the total circle. The shaded area of the second circle represents $\frac{1}{5}$ of the total circle. When subtracted, $\frac{3}{5}$ of the total circle is shaded.

Model 2: $\frac{4}{5}-\frac{1}{5}=\frac{3}{5}$ (Note that the denominators are the same. These fractions have like denominators of 5.)


## Operations

Only fractions with like denominators can be added or subtracted．Write the sum or the difference of the numerator over the common denominator．

Model 1：$\frac{1}{5}+\frac{2}{5}=\left(\frac{1+2}{5}\right)=\frac{3}{5}$
Think
Model 2：$\frac{9}{11}-\frac{5}{11}=\left(\frac{9-5}{11}\right)=\frac{4}{11}$

## ジイホ楽＊Add or subtract．

$1.1 \frac{3}{8}+\frac{2}{8}=$ $\qquad$
$1.2 \frac{6}{11}+\frac{4}{11}=$ $\qquad$
$1.3 \frac{2}{17}+\frac{12}{17}=$ $\qquad$
$1.4 \quad \frac{5}{6}-\frac{4}{6}=$
$1.5 \quad \frac{13}{19}-\frac{6}{19}=$
$1.6 \frac{12}{23}-\frac{9}{23}=$
$1.9 \quad \frac{17}{29}$
$1.10 \quad \frac{4}{5}$
$-\frac{12}{29}$
$-\frac{2}{5}$

Fractions are said to be in simplified form when they have been reduced．To reduce a fraction，divide both numerator and denominator by the one largest number that will divide into both evenly．

Model 1：$\frac{4}{9}+\frac{2}{9}=\frac{6}{9}=\left(\frac{6 \div 3}{9 \div 3}\right)=\frac{2}{3}$
Think
Model 2：$\frac{9}{14}-\frac{5}{14}=\frac{4}{14}=\left(\frac{4 \div 2}{14 \div 2}\right)=\frac{2}{7}$

## 皆楽米 Add or subtract and simplify．



When the numerator of a fraction is greater than the denominator，the fraction is called an improper fraction．Improper fractions can be simplified to mixed numbers，an expression containing a whole number and a fraction．

To simplify an improper fraction to a mixed number，divide the denominator into the numerator，and write the remainder in fractional form．

## Definitions

Improper fraction：a fraction with a numerator greater than or equal to its denominator Mixed number：a number made up of a whole number plus a common fraction．

Model 1：improper fraction $=$ quotient $\frac{\text { remainder }}{\text { divisor }}$

$$
\begin{gathered}
\frac { 8 } { 5 } = 5 \longdiv { 8 } \frac { 3 } { 5 } \\
\frac{5}{3}
\end{gathered}
$$

