

MATH VOCABULARY REVIEW

numerator the number above the fraction bar in a fraction that tells the number of equal parts that are being described.

denominator the number below the fraction bar in a fraction that tells the number of equal parts in the whole.

equivalent fractions two or more fractions that name the same part of a whole or the same point on a number line.

common denominator a number that is a common multiple of the denominators of two or more fractions.

What is a **Fraction**?

Part of a whole

A number that expresses equal parts of a whole object or set of objects.

$$\frac{2}{3} \quad \frac{1}{2} \quad \frac{3}{4} \quad \frac{4}{7}$$

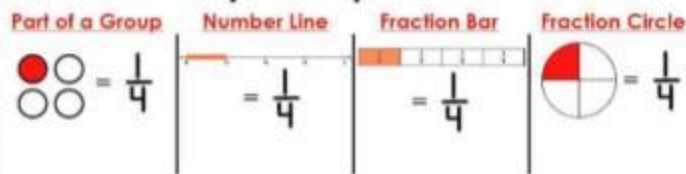
part
—
whole

Parts of a fraction:

$\frac{1}{2}$
↑ **numerator** = how many fraction pieces you have
↓ **denominator** = how many fraction pieces your whole is broken into
*d = down
fraction bar
*represents division

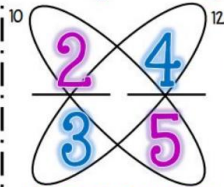
KEY WORDS: halves, thirds, fourths, fifths, sixths, sevenths, eighths, etc.

Different Ways to Represent a Fraction



Compare Fractions

Comparing Fractions



1. Circle the pairs of numbers that are diagonal from one another.

2. Multiply the numerator from the first fraction by the denominator in the second fraction (Purple numbers). Write the product above the first fraction.

3. Multiply the denominator from the first fraction by the numerator in the second fraction (Blue numbers). Write the product above the second fraction.

4. Compare the two products above the numerators. Write a number sentence with the fractions.

$$10 < 12 \text{ so } 2/3 < 4/5$$

Comparing Fractions Rules

If your fractions have the same **denominator**, compare the numerators.

The fraction with the **larger numerator** is greater!

$$\frac{5}{8} > \frac{3}{8}$$

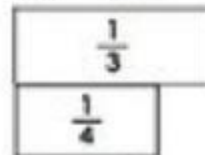


$\frac{5}{8}$ is greater!

If your fractions have the same **numerator**, compare the denominators.

The fraction with the **smaller denominator** is the greater fraction!

$$\frac{1}{3} > \frac{1}{4}$$



$\frac{1}{3}$ is greater!

IMPROPER FRACTIONS

An improper fraction is a fraction where the **numerator** is greater than the **denominator**

Improper Fraction \rightarrow Mixed Number

$$\frac{34}{8} \rightarrow 4\frac{2}{8}$$

$$\begin{array}{r} 04 \\ 8 \overline{)34} \\ \underline{-0} \\ 34 \\ \underline{-32} \\ 2 \end{array}$$

Step 1: Set up a long division problem

Step 2: Divide

Step 3: Draw your "J" starting at the top (quotient)

Step 4: Write the mixed number

$$\begin{array}{r} 04 \text{ Start Here} \\ 8 \overline{)34} \\ \underline{-0} \\ 34 \\ \underline{-32} \\ 2 \end{array}$$

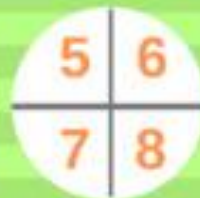
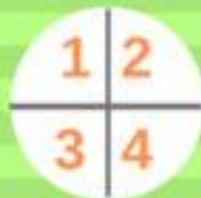
$$4\frac{2}{8}$$

An improper fraction is a number that is >1

$$\frac{12}{4}$$

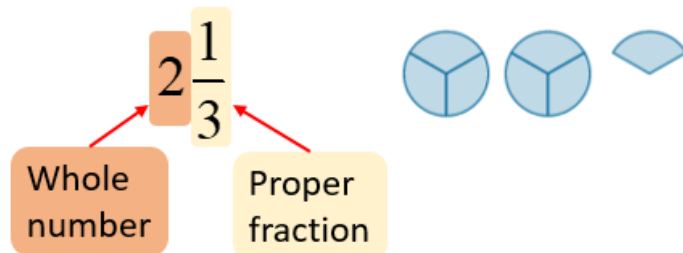
The numerator is larger than the denominator

$$\frac{12}{4} = 3 \text{ wholes}$$



Mixed Numbers

A mixed number is a number that consists of a whole number and a proper fraction.



Add Mixed Numbers With Like Denominators (A)

Add the whole numbers.

Add the fractions.

Reduce the fraction. The whole number stays the same.

$$9\frac{3}{10} + 7\frac{1}{10} = 16\frac{4}{10} \div 2 = 16\frac{2}{5}$$

Mixed Number

Improper Fraction

Step 1: Multiply the whole number and the denominator
 $4 \times 3 = 12$

Step 2: Add the product to the numerator
 $12 + 2 = 14$

Step 3: Put the sum over the denominator

$$4\frac{2}{3} = \frac{14}{3}$$

Improper Fraction

Mixed Number

Step 1: Remainder goes into the numerator

Step 2: Divisor goes into the denominator

$$\frac{14}{3} = 4\frac{2}{3}$$

Add & Subtract Fractions

Add & Subtract with Unlike Denominators

1. Check if denominators are the same.
2. Write the fractions vertically
3. Find the LCD
4. The LCD becomes the new denominator for EACH fraction.
5. Add/Subtract & Simplify if needed

L.C.D.

Least Common Denominator

Step 1:

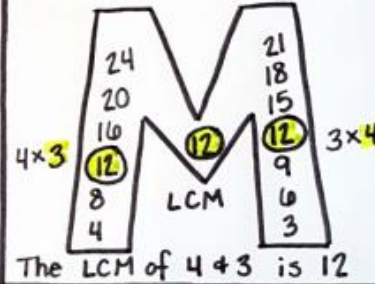
Identify the denominators

$\frac{1}{4}$ and $\frac{2}{3}$
Denominators

Step 2:

Find the LCM, or least common multiple, of the two denominators.

The LCM is also the Least Common Denominator.



Step 3:

To write equivalent fractions, multiply by the same number the denominator was multiplied by to get the common denominator.

Original Fraction		Equivalent Fraction
$\frac{1}{4}$	$\times 3$	$\frac{3}{12}$
$\frac{2}{3}$	$\times 4$	$\frac{8}{12}$

Subtract Mixed Numbers with Regrouping

$$\begin{array}{r} 3 \frac{3}{9} \\ - 1 \frac{5}{9} \\ \hline \end{array}$$

Can't subtract
5 from 3!

Regroup the whole as a fraction with
the same denominator. Since the
denominator is ninths 1 whole = $\frac{9}{9}$

Regrouping $\frac{9}{9}$ plus the $\frac{3}{9}$ you
started with gives you $\frac{12}{9}$

$$\begin{array}{r} 2 \\ \cancel{3} \frac{3}{9} + \frac{9}{9} = 2 \frac{12}{9} \end{array}$$

$$\begin{array}{r} - 1 \frac{5}{9} \\ \hline 1 \frac{7}{9} \end{array}$$

Multiply Fractions

Multiply a Fraction & A Whole Number

Step 1

Write the whole number as a fraction.

Example Problem: $\longrightarrow 2 \times \frac{1}{8}$

Whole number '2'
written as a fraction. $\nearrow \left(\frac{2}{1}\right) \times \frac{1}{8}$

Step 2

Multiply the numerators together.
Multiply the denominators together.

$$\begin{array}{l} \text{Numerators } \frac{2}{1} \times \frac{1}{8} = \frac{2}{8} \\ \text{Denominators } \frac{1}{1} \times \frac{1}{8} = \frac{1}{8} \end{array}$$

Step 3

Check your answer. If it is an improper fraction, change it to a mixed number. If it is not in lowest terms, simplify.

Final Answer

$$\frac{2}{8} \div 2 = \boxed{\frac{1}{4}}$$

\nearrow The fraction $\frac{2}{8}$ is not in lowest terms and can be simplified.

Multiply Two Fractions

Step 1

Example Problem: $\longrightarrow \frac{3}{5} \times \frac{5}{8}$

Multiply the numerators together.
Multiply the denominators together.

$$\begin{array}{l} \text{Numerators} \quad \frac{3}{5} \times \frac{5}{8} = \frac{15}{40} \\ \text{Denominators} \end{array}$$

Step 2

Check your answer. If it is an improper fraction, change it to a mixed number. If it is not in lowest terms, simplify.

Final Answer

$$\frac{15}{40} \div 5 = \boxed{\frac{3}{8}}$$

The fraction $\frac{15}{40}$ is not in lowest terms and can be simplified.

Multiply Mixed Numbers

Step 1

Example Problem: $\rightarrow 3\frac{2}{3} \times 2\frac{3}{7}$

Write each mixed number as an improper fraction.

$$\begin{array}{l} \textcircled{3} \times \frac{2}{3} = \frac{11}{3} \\ \text{8} \times \text{3} = \text{24} + \text{11} \\ \textcircled{2} \times \frac{3}{7} = \frac{17}{7} \\ \text{7} \times \text{2} = \text{14} + \text{17} \end{array}$$

Step 2

Rewrite the multiplication problem horizontally using the improper fractions.

$$\frac{11}{3} \times \frac{17}{7}$$

Step 3

Multiply the numerators together.
Multiply the denominators together.

$$\begin{array}{l} \text{Numerators } \frac{11}{3} \times \frac{17}{7} = \frac{187}{21} \\ \text{Denominators } \frac{11}{3} \times \frac{17}{7} = \frac{187}{21} \end{array}$$

Step 4

Check your answer. If it is an improper fraction, change it to a mixed number.

$$\begin{array}{r} 187 \leftarrow \text{Dividend} \\ 21 \leftarrow \text{Divisor} \\ \hline 8 \leftarrow \text{Whole Number} \\ 21 \overline{)187} \\ \underline{-168} \\ 19 \leftarrow \text{Numerator} \\ \hline \end{array}$$

The fraction $\frac{187}{21}$ is an improper fraction and must be changed to the mixed number.

Denominator

Mixed Number

Step 5

Check your answer. If the fraction is not reduced to lowest terms, you must simplify.

Final Answer

$$8\frac{19}{21}$$

Since the numerator and the denominator do not share a common factor, the fraction is simplified to lowest terms.

Divide Fractions

Dividing Fractions

$$\frac{3}{4} \div \frac{2}{7}$$

Keep

$$\frac{3}{4}$$

Change

\times

Flip

$$\frac{7}{2}$$

$$= \frac{21}{8}$$