Lesson 3

Foundations of College Algebra

Add Fractions with a Common Denominator

How To - Fraction Addition

If a, b, and c are numbers where $c \neq 0$, then

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

To add fractions with a common denominator, add the numerators and place the sum over the common denominator.

Note: Subtracting fractions works the exact same way.

Examples

Find each sum.

1. $\frac{4}{9} + \frac{1}{9}$
2. $\frac{1}{6} + \frac{3}{6}$
3. $\frac{3}{8} + \frac{3}{8}$

You Try

Find each sum.

1. $\frac{2}{9} + \frac{5}{9}$
2. $\frac{9}{15} + \frac{7}{15}$
3. $\frac{3}{16} + \frac{7}{16}$

Subtract Fractions with a Common Denominator

Examples

1. $\frac{23}{24} - \frac{14}{24}$
2. $\frac{19}{28} - \frac{7}{28}$

You Try

1. $\frac{5}{8} - \frac{2}{8}$
2. $\frac{7}{12} - \frac{5}{12}$

Solve Problems by Adding or Subtracting Fractions with a Common Denominator

You Try

Trail Mix Jacob is mixing together nuts and raisins to make trail mix. He has $\frac{6}{10}$ of a pound of nuts and $\frac{3}{10}$ of a pound of raisins. How much trail mix can he make?

Find the Least Common Multiple Using Lists

Definitions

- A number is a **multiple** of n if it is the product of a counting number and n. For example, the multiples of 4 are:

$$4, 8, 12, 16, 20, \ldots.$$

- The smallest number that is a multiple of two numbers is called the **least common multiple (LCM)**.
- The **least common denominator (LCD)** of two fractions is the least common multiple (LCM) of their denominators.

How To - Find the Least Common Multiple Using Lists

1. List the first several multiples of each number.
2. Look for multiples common to both lists. If there are no common multiples in the lists, write out additional multiples for each number.
3. Look for the smallest number that is common to both lists.
4. This number is the LCM.

Examples

Find the least common multiple by listing multiples.

1. $8, 12$

2. $12, 16$

3. $60, 75$

You Try

Find the least common multiple by listing multiples.

1. $4, 3$

2. $6, 15$

3. $20, 30$

Write Equivalent Fractions

Fact

If a, b, c are whole numbers where $b \neq 0$, $c \neq 0$, then

$$\frac{a}{b} = \frac{a \cdot c}{b \cdot c} \text{ and } \frac{a \cdot c}{b \cdot c} = \frac{a}{b}.$$

Examples

Change to equivalent fractions with the LCD.

1. $\frac{3}{4}$ and $\frac{5}{6}$

2. $\frac{8}{15}$ and $\frac{11}{24}$

You Try

Change to equivalent fractions with the LCD.

1. $\frac{1}{3}$ and $\frac{1}{4}$

2. $\frac{5}{12}$ and $\frac{7}{8}$

3. $\frac{13}{16}$ and $\frac{11}{12}$

Add Unlike Fractions

How To - Add or Subtract Fractions with Different Denominators

1. Find the LCD.
2. Convert each fraction to an equivalent form with the LCD as the denominator.
3. Add or subtract the fractions.
4. Write the result in simplified form.

Examples

Add.

1. $\frac{1}{2} + \frac{1}{5}$
2. $\frac{7}{12} + \frac{11}{15}$
3. $\frac{39}{56} + \frac{22}{35}$

You Try

1. $\frac{1}{3} + \frac{1}{5}$
2. $\frac{5}{12} + \frac{3}{8}$
3. $\frac{9}{20} + \frac{17}{30}$

Subtract Unlike Fractions

Examples

1. $\frac{7}{12} - \frac{9}{16}$
2. $\frac{19}{24} - \frac{7}{15}$

You Try

$\frac{7}{16} - \frac{5}{12}$

$\frac{11}{12} - \frac{3}{8}$

Solving Problems by Adding or Subtracting Fractions

You Try

Laronda is making covers for the throw pillows on her sofa. For each pillow cover, she needs $\frac{3}{16}$ yard of print fabric and $\frac{3}{8}$ yard of solid fabric. What is the total amount of fabric Laronda needs for each pillow cover?