2 Fractions

Everyday use of Fractions

- ¾ hour overtime worked last night.
- 1 ½ cups of milk in a recipe.
- 4 ¾ yards of fabric to upholster a chair.
- Decimal Fractions
- 7.9 gallons of gas.
- 1.23 pounds of hamburger.
- Wages of $31.50 per hour.
- Eggs cost $2.99 per dozen.

Key Terms

- numerator
- denominator
- proper fraction
- improper fraction
- mixed number

REVIEW: Convert improper fractions to mixed numbers.

Example

Convert $\frac{35}{6}$ to a mixed number.

STEPS

Divide the numerator by the denominator.

$$6\overline{)35}$$

$$\begin{array}{r} 5 \\ 30 \\ \hline 5 \end{array}$$

Place the remainder over the divisor. $\frac{5}{6}$

Write the mixed number as $5\frac{5}{6}$.

REVIEW: Convert mixed numbers to improper fractions.

Example

Convert $9\frac{1}{4}$ to an improper fraction.

STEPS

Multiply the denominator by the whole number.

$4 \times 9 = 36$

Add the product and the numerator.

$36 + 1 = 37$

Place the sum over the original denominator.

$\frac{37}{4}$

REVIEW: Reduce fractions to lowest terms.

Example

Reduce $\frac{18}{36}$ to lowest terms.

STEPS

$$\frac{18}{36} = \frac{18}{36} \leftarrow \text{divided by } 18 = 1$$

$$\frac{18}{36} \leftarrow \text{divided by } 18 = 2$$

$$\frac{18}{36} = \frac{1}{2}$$

REVIEW: Convert fractions to decimals.

Example

Convert the fraction $\frac{7}{8}$ to a decimal.

STEPS

$$
\begin{array}{r}
0.875 \\
8\overline{)7.000} \\
\underline{6\ 4} \\
60 \\
\underline{56} \\
40 \\
\underline{40} \\
0
\end{array}
$$

REVIEW: Convert fractions to decimals.

Example

Convert $5\frac{5}{8}$ to a decimal.

STEPS

Convert the fractional part by dividing the numerator by the denominator.

Write the whole number 5 with the decimal equivalent 0.625.

5.625

$$
\begin{array}{r}
0.625 \\
8\overline{)5.000} \\
\underline{4\ 8} \\
20 \\
\underline{16} \\
40 \\
\underline{40} \\
0
\end{array}
$$

REVIEW: Convert decimals to fractions.

Example

Convert 1.35 to a fraction.

STEPS

Write the decimal in its fractional form.

$$\frac{35}{100}$$

Reduce to lowest terms.

$$\frac{35}{100} = \frac{7}{20}$$

The fractional equivalent to 1.35 is $1\frac{7}{20}$.

REVIEW Convert decimals to fractions.

Example

Convert 0.45 to a fraction.

STEPS

Write the decimal in its fractional form.

$$\frac{45}{100}$$

Reduce to lowest terms.

$$\frac{45}{100} = \frac{9}{20}$$

The fractional equivalent to 0.45 is $\frac{9}{20}$.

2.2 Add/Subtract Fractions and Mixed Numbers

OBJECTIVES

1. Identify terms used with adding and subtracting fractions.
2. Add and subtract like fractions.
3. Find the least common denominator.
4. Add and subtract unlike fractions.

2.2 Add/Subtract Fractions and Mixed Numbers

OBJECTIVES

4. Add mixed numbers.
5. Subtract mixed numbers.
6. Use Excel to add and subtract fractions and mixed numbers.

REVIEW Add and subtract like fractions.

Example

Add. $\frac{5}{9} + \frac{2}{9}$

STEPS

Add the numerators.

$5 + 2 = 7$

Write the result over the common denominator.

$\frac{7}{9}$

REVIEW Add and subtract like fractions.

Example

Subtract. $\frac{11}{12} - \frac{7}{12}$

STEPS

Subtract the numerators.

$11 - 7 = 4$

Write the result over the common denominator.

$\frac{4}{12}$

Reduce.

$\frac{4}{12} = \frac{1}{3}$

REVIEW Add and subtract unlike fractions.

Example

Add. $\frac{3}{8}+\frac{7}{12}+\frac{11}{20}$

STEPS

$$\frac{3}{8}=\frac{45}{120}$$

$$\frac{7}{12}=\frac{70}{120}$$

$$+\frac{11}{20}=\frac{66}{120}$$

$$\frac{181}{120}=1\frac{61}{120}$$

REVIEW Add mixed numbers.

Example

Add. $13\frac{3}{5}+2\frac{3}{10}$

STEPS

Determine the least common denominator.

10

Add the fractional parts. $\frac{3}{5}+\frac{3}{10}=\frac{6}{10}+\frac{3}{10}=\frac{9}{10}$

Add the whole numbers. 13 + 2 = 15

Add the whole numbers and the fractional parts.

$15+\frac{9}{10}=15\frac{9}{10}$

REVIEW Subtract mixed numbers.

Example

Subtract. $\frac{3}{5} - \frac{1}{2}$

STEPS

$$\frac{3}{5} = \frac{6}{10}$$

$$-\frac{1}{2} = -\frac{5}{10}$$

$$\frac{1}{10}$$

REVIEW Subtract mixed numbers.

Example

Subtract using borrowing. $12\frac{3}{10} - 4\frac{1}{5}$

STEPS

Determine a common denominator and change the fractions to equivalent fractions. Subtract the fractional parts and the whole numbers.

$$12\frac{3}{10} = 12\frac{3}{10}$$

$$-4\frac{1}{5} = -4\frac{2}{10}$$

$$8\frac{1}{10}$$

REVIEW Multiply fractions.

Example

Multiply. $\frac{5}{8} \times \frac{3}{5} \times \frac{1}{3}$

STEPS

Multiply the numerators of the fractions.

$5 \times 3 \times 1 = 15$

Multiply the denominators of the fractions.

$8 \times 5 \times 3 = 120$

Rewrite the fraction and reduce.

$$\frac{15}{120} = \frac{1}{8}$$

REVIEW Multiply whole numbers, fractions, and mixed numbers.

Example

Multiply. $5 \times \frac{2}{3} \times \frac{7}{8}$

STEPS

Convert to improper fractions and cancel.

$$\frac{5}{1} \times \frac{\cancel{2}^{1}}{3} \times \frac{7}{\cancel{8}_{4}}$$

Multiply the numerators and denominators.

$$\frac{5}{1} \times \frac{1}{3} \times \frac{7}{4} = \frac{35}{12}$$

Convert to a mixed number and reduce. $\frac{35}{12} = 2\frac{11}{12}$

REVIEW Divide fractions.

Example

Divide. $\frac{5}{6} \div \frac{2}{3}$

STEPS

Invert the divisor and multiply.

$$\frac{5}{\cancel{6}_{2}} \times \frac{\cancel{3}^{1}}{2} = \frac{5}{4}$$

Convert the improper fraction to a mixed number and reduce.

$$\frac{5}{4} = 1\frac{1}{4}$$

REVIEW Divide whole numbers, fractions, and mixed numbers.

Example

Divide. $6 \div \frac{3}{4}$

STEPS

Write the whole number as a fraction and invert the divisor.

$$\frac{6}{1} \times \frac{4}{3}$$

Cancel, if necessary, and multiply.

$$\frac{\cancel{6}^{2}}{1} \times \frac{4}{\cancel{3}_{1}} = \frac{8}{1} = 8$$