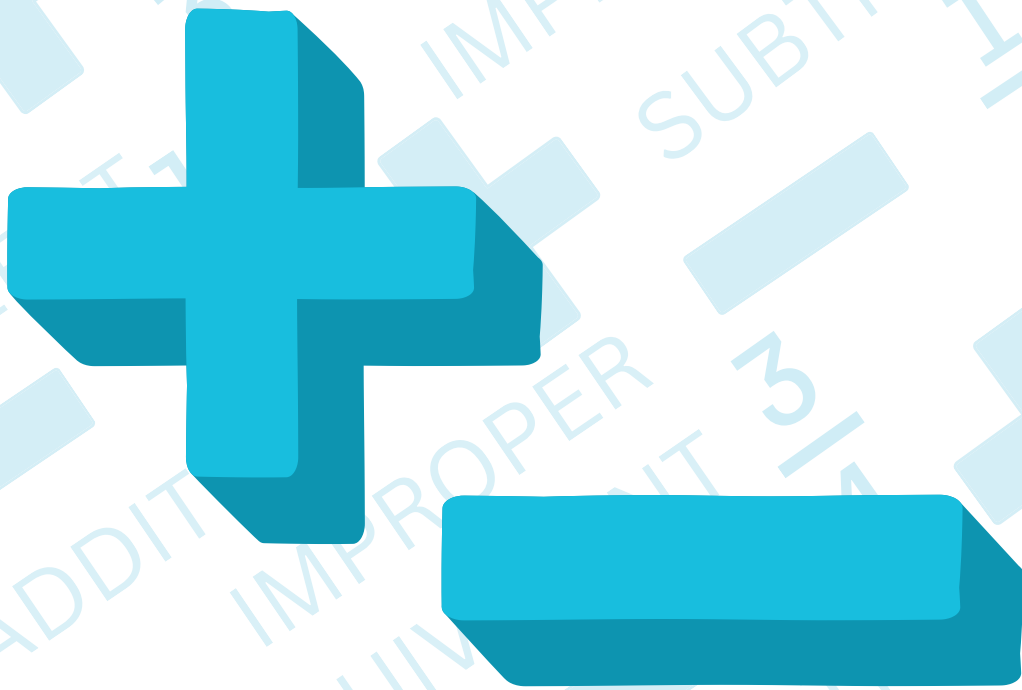


Topic Tutorials

POWERED BY *Alpha II*

Fractions

Addition & Subtraction



Student copy: Fractions - Addition & Subtraction Topic Tutorials

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Subtracting Like Fractions

You have already learned that fractions that have the same denominator are called '**like**' fractions. Subtracting *like* fractions can be done by following the steps below.

$$\frac{7}{8} - \frac{3}{8} = ?$$

Step 1: Subtract the numerators.

$$\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$$

Step 2: Keep the denominator the same.

$$\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$$

Step 3: Simplify to lowest terms.

$$\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$$

Answer: $\frac{1}{2}$

Procedure:

1) Subtract: $\frac{4}{5} - \frac{1}{5}$

$$\frac{4}{5} - \frac{1}{5} = \frac{4-1}{5} = \frac{3}{5}$$

Answer: $\frac{3}{5}$

2) Subtract: $\frac{7}{8} - \frac{3}{8}$

$$\frac{7}{8} - \frac{3}{8} = \frac{7-3}{8} = \frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$$

Answer: $\frac{1}{2}$

3) Subtract: $\frac{9}{16}$
 $- \frac{3}{16}$

$$\frac{6}{16} = \frac{6 \div 2}{16 \div 2} = \frac{3}{8}$$

Answer: $\frac{3}{8}$

4) Subtract: $\frac{11}{12} - \frac{5}{12}$

$$\frac{11}{12} - \frac{5}{12} = \frac{7}{12}$$

Answer: $\frac{7}{12}$

Try These:

Subtract.

$$1) \frac{7}{8} - \frac{5}{8}$$

$$2) \frac{4}{5} - \frac{3}{5}$$

$$3) \frac{15}{16} - \frac{9}{16}$$

$$4) \frac{15}{26} - \frac{5}{26}$$

$$5) \frac{16}{25} - \frac{8}{25}$$

$$6) \frac{11}{20} - \frac{9}{20}$$

$$7) \frac{14}{19} - \frac{7}{19}$$

$$8) \frac{14}{20} - \frac{9}{20}$$

$$9) \frac{7}{8} - \frac{1}{8}$$

$$10) \frac{23}{32} - \frac{15}{32}$$

Renaming Mixed Numbers

You have already learned that a fraction expresses part of a whole unit. You can also express the whole unit as a fraction.

$$1 = \frac{1}{1} \quad 1 = \frac{2}{2} \quad 1 = \frac{3}{3} \quad 1 = \frac{4}{4} \quad 1 = \frac{5}{5} \dots$$

You can use this idea to help you rename whole numbers as mixed numbers. Example: Rename 9 as a mixed number. Follow the steps below.

Step 1: $9 = 8 + 1$

Step 2: Choose a denominator.

We will use 3 for this example.

Step 3: Change 1 to a fraction with that denominator.

$$9 = 8\frac{3}{3} \quad \text{Answer: } 8\frac{3}{3}$$

Sometimes you will need to rename mixed numbers. The method is simple. Example: Rename $9\frac{3}{4}$. Follow the steps below.

Step 1: $9 = 8 + 1$

Step 2: Change 1 to a fraction with the denominator 4.

We change to the denominator of 4 because that is the given denominator in the problem.

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

Step 3: Rewrite the mixed number.

$$9\frac{3}{4} = 8 + 1 + \frac{3}{4} = 8 + \frac{4}{4} + \frac{3}{4} = 8 + \frac{7}{4} = 8\frac{7}{4}$$

Answer: $8\frac{7}{4}$

Procedure:

1) Change 4 to a mixed number with a denominator of 6.

$$4 = 3 + 1$$

$$4 = 3 + \frac{6}{6}$$

$$4 = 3\frac{6}{6}$$

$$\text{Answer: } 3\frac{6}{6}$$

2) Change 23 to a mixed number with a denominator of 5.

$$23 = 22 + 1$$

$$23 = 22 + \frac{5}{5}$$

$$\text{Answer: } 22\frac{5}{5}$$

3) Rename the mixed number: $2\frac{2}{3}$

$$2\frac{2}{3} = 1 + 1 + \frac{2}{3}$$

$$= 1 + \frac{3}{3} + \frac{2}{3} = 1\frac{5}{3}$$

$$\text{Answer: } 1\frac{5}{3}$$

4) Rename the mixed number: $5\frac{6}{8}$

$$5\frac{6}{8} = 4 + 1 + \frac{6}{8}$$

$$= 4 + \frac{8}{8} + \frac{6}{8}$$

$$= 4\frac{14}{8}$$

$$\text{Answer: } 4\frac{14}{8}$$

Try These:

- 1) Change 5 to a mixed number with a denominator of 9.

- 2) Change 7 to a mixed number with a denominator of 3.

- 3) Change 19 to a mixed number with a denominator of 7.

- 4) Change 13 to a mixed number with a denominator of 8.

- 5) Rename the mixed number: $6\frac{1}{2}$

6) Rename the mixed number: $4\frac{3}{5}$

7) Rename the mixed number: $3\frac{2}{9}$

8) Rename the mixed number: $12\frac{1}{5}$

9) Rename the mixed number: $8\frac{1}{3}$

10) Rename the mixed number: $10\frac{3}{4}$

Solving Problems with Fractions

Solving word problems with fractions can be simple by following the steps below and looking for clues. Read this problem. Follow the steps to solve it.

Terry had $6\frac{7}{8}$ yards of green fabric. She also had $4\frac{3}{8}$ yards of blue fabric. How many more yards of green than blue fabric did she have?

Step 1: Read the problem.

Step 2: Learn what you must find out.

How many more yards of green fabric did Terry have?

Step 3: Notice the *clue words*. Clue words help you solve the problem. 'How many more' tells you to find the *difference* between two numbers. To solve this problem, you should *subtract*.

Step 4: Find the numbers. Which is the larger number? Which number will you subtract from the larger number?

Larger number: $6\frac{7}{8}$

Number to subtract: $4\frac{3}{8}$

Step 5: Write the problem. Solve it.

$$6\frac{7}{8} - 4\frac{3}{8} = 2\frac{4 \div 4}{8 \div 4} = 2\frac{1}{2}$$

Step 6: Check the answer. Does it make sense?

$2\frac{1}{2}$ makes sense. It is *less* than the amount of green fabric.

CLUE WORDS

These words tell you to find the difference between numbers. This means you will need to **subtract**.

How many more

how many fewer

how much more

How much larger

how much shorter

remain

Left

difference

These words tell you to put numbers together. This means you will need to **add**.

In all

together

altogether

Total

both

Reminder: Not all problems have clue words.

Procedure:

1) Helen bought $4\frac{5}{8}$ yards of material for a dress. If her mother plans to use only $3\frac{3}{4}$ yards, how much extra material did Helen buy?

Given Facts: Bought $4\frac{5}{8}$ yards; Using $3\frac{3}{4}$ yards

Question Asked: How much extra material was bought?

Operation Needed: *How much extra* indicates subtraction.

Write out your Plan: The difference between the yards bought and the yards used equals the amount of extra material.

Estimate your answer:

$$4\frac{5}{8} \longrightarrow 5$$

$$3\frac{3}{4} \longrightarrow \underline{-4}$$

1 yard (estimate)

Solve:

$$4\frac{5}{8} - 3\frac{3}{4} = 4\frac{5}{8} - 3\frac{6}{8} = 3\frac{13}{8} - 3\frac{6}{8} = 0\frac{7}{8}$$

Answer: $\frac{7}{8}$ yard

Check your accuracy:

$$3\frac{3}{4} + \frac{7}{8} = 3\frac{6}{8} + \frac{7}{8} = 3\frac{13}{8} = 3 + 1\frac{5}{8} = 4\frac{5}{8}$$

Compare answer to estimate:

The answer $\frac{7}{8}$ yards compares reasonably with the estimate 1 yard because they are very close.

Try These:

1) A merchant sold $7\frac{5}{8}$ yards of cloth to a customer. If it was cut from a bolt that contained $18\frac{2}{3}$ yards, what length remained on the bolt?

2) Find the total thickness of two pieces of wood that Donald glued together if one is $1\frac{5}{16}$ inch thick and the other is $\frac{7}{8}$ inch thick.

3) A pilot finds that winds slow her progress in reaching her destination. Her trip out takes $2\frac{3}{4}$ hours. How long should her return trip take if she must return at the end of $4\frac{1}{2}$ hours of flying time?

4) Find the net change in a stock if it opened at $63\frac{7}{8}$ and closed at $65\frac{1}{4}$.

- 5) The running time of a train from Chicago to San Francisco was changed to $49\frac{1}{3}$ hours. If this schedule saves $13\frac{3}{4}$ hours, how long did the trip take before the change was made?