Word Problems with Fraction Addition and Subtraction

Word Problems with Fraction Addition and Subtraction: Apply, Compare, and Design

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Combine lengths or amounts with addition; find what remains or what is missing with subtraction. Use a common unit. For $\frac{1}{2}$ L plus $\frac{1}{3}$ L, $\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$ L. Units belong to the result, not the denominator.

Worked example

A container holds $\frac{3}{5}$ L. Another $\frac{1}{4}$ L is added. How much is in the container now?

1. The quantities call for $\frac{3}{5} + \frac{1}{4}$; the result is measured in L.
2. A common denominator is 20: $\frac{3}{5} = \frac{12}{20}$ and $\frac{1}{4} = \frac{5}{20}$.
3. $\frac{3}{5} + \frac{1}{4} = \frac{12+5}{20} = \frac{17}{20}$.
4. Simplify to $\frac{17}{20}$; check $\frac{17}{20} - \frac{1}{4} = \frac{3}{5}$.

Answer: $\frac{17}{20}$ L.

Practice Problems

Show your thinking.

1. A walker travels $\frac{5}{8}$ km, then $\frac{1}{3}$ km. Find the total distance.

2. Plan A uses $\frac{3}{4}$ m plus $\frac{2}{5}$ m of fabric. Plan B uses $1\frac{1}{8}$ m. Which uses less and by how much?

3. A jug has $\frac{3}{4}$ L. Add $\frac{2}{3}$ L, then pour out $\frac{1}{2}$ L. How much is left?

4. A 2 L jug must hold $\frac{5}{6}$ L juice and $\frac{3}{4}$ L water. Will it overflow? Find the unused capacity.

5. Find the missing number: $\frac{5}{6} - \square = \frac{7}{12}$. Check by substitution.

6. A recipe needs $1\frac{1}{2}$ cups of oats. You have $\frac{5}{8}$ cup. How much more is needed?

7. Design two ribbon pieces totaling $1\frac{3}{4}$ m. One must be $\frac{2}{3}$ m. Find the other and check the total.

8. Design a 1 L mixture using $\frac{2}{5}$ L of juice and the rest water. Find the water needed.

Answer Key

1. $\frac{23}{24}$ km.
2. B uses $\frac{1}{40}$ m less.
3. $\frac{11}{12}$ L.
4. No; $\frac{5}{12}$ L remains.
5. $\frac{1}{4}$.
6. $\frac{7}{8}$ cup.
7. $1\frac{1}{12}$ m.
8. $\frac{3}{5}$ L.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The quantities call for $\frac{5}{8} + \frac{1}{3}$; the result is measured in km.
2. A common denominator is 24: $\frac{5}{8} = \frac{15}{24}$ and $\frac{1}{3} = \frac{8}{24}$.
3. $\frac{5}{8} + \frac{1}{3} = \frac{15+8}{24} = \frac{23}{24}$.
4. Simplify to $\frac{23}{24}$; check $\frac{23}{24} - \frac{1}{3} = \frac{5}{8}$.

Problem 2

1. A uses $\frac{15}{20} + \frac{8}{20} = \frac{23}{20}$ m.
2. Compare in fortieths: $\frac{23}{20} = \frac{46}{40}$ and $\frac{9}{8} = \frac{45}{40}$.
3. $\frac{46}{40} - \frac{45}{40} = \frac{1}{40}$ m.

Problem 3

1. First combine: $\frac{3}{4} + \frac{2}{3} = \frac{9}{12} + \frac{8}{12} = \frac{17}{12}$ L.
2. Then remove $\frac{1}{2} = \frac{6}{12}$ L: $\frac{17}{12} - \frac{6}{12} = \frac{11}{12}$ L.
3. Check: $\frac{11}{12} + \frac{1}{2} = \frac{17}{12}$ L.

Problem 4

1. Mixture: $\frac{5}{6} + \frac{3}{4} = \frac{10}{12} + \frac{9}{12} = \frac{19}{12}$ L.
2. Capacity is $2 = \frac{24}{12}$ L.
3. Unused: $\frac{24}{12} - \frac{19}{12} = \frac{5}{12}$ L.

Problem 5

1. Undo the known operation to find the missing value: $\frac{5}{6} - \frac{7}{12} = \frac{1}{4}$.
2. A common denominator is 12: $\frac{5}{6} = \frac{10}{12}$ and $\frac{1}{4} = \frac{3}{12}$.
3. $\frac{5}{6} - \frac{1}{4} = \frac{10-3}{12} = \frac{7}{12}$.
4. Simplify to $\frac{7}{12}$; check $\frac{7}{12} + \frac{1}{4} = \frac{5}{6}$.

Problem 6

1. $1\frac{1}{2} = \frac{12}{8}$ cups.
2. $\frac{12}{8} - \frac{5}{8} = \frac{7}{8}$ cup.
3. $\frac{5}{8} + \frac{7}{8} = \frac{12}{8}$ cups checks the total.

Problem 7

1. Target: $1\frac{3}{4} = \frac{7}{4} = \frac{21}{12}$ m.
2. The other piece is $\frac{21}{12} - \frac{8}{12} = \frac{13}{12}$ m.
3. $\frac{2}{3} + \frac{13}{12} = \frac{21}{12} = \frac{7}{4}$ m.

Problem 8

1. $1 = \frac{5}{5}$ L.
2. Water is $\frac{5}{5} - \frac{2}{5} = \frac{3}{5}$ L.
3. $\frac{2}{5} + \frac{3}{5} = 1$ L verifies the design.

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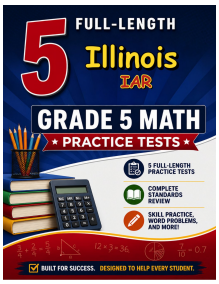

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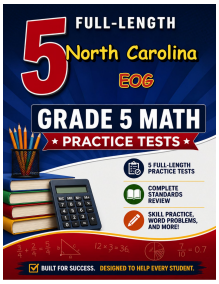

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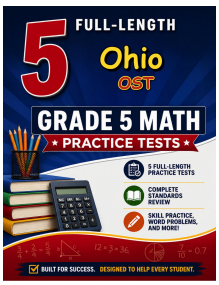

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