Adding and Subtracting Mixed Numbers

Adding and Subtracting Mixed Numbers: Apply, Compare, and Design

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

QUICK REVIEW

Name the unit before choosing the operation. A $1\frac{1}{2}$-m strip plus a $1\frac{1}{4}$-m strip totals $2\frac{3}{4}$ m. When a decision depends on an exact limit, compare both values in the same units and give the leftover or shortfall.

Worked example

Find $4\frac{1}{3} - 1\frac{3}{4}$.

1. Convert to improper fractions: $4\,\frac{1}{3} = \frac{13}{3}$ and $1\,\frac{3}{4} = \frac{7}{4}$.
2. A common denominator is 12: $\frac{13}{3} = \frac{52}{12}$ and $\frac{7}{4} = \frac{21}{12}$.
3. $\frac{13}{3} - \frac{7}{4} = \frac{52-21}{12} = \frac{31}{12}$.
4. Rename the result: $\frac{31}{12} = 2\,\frac{7}{12}$.

Answer: $2\,\frac{7}{12}$.

Practice Problems

Show your thinking.

1. A morning hike is $3\frac{3}{4}$ km and an afternoon hike is $2\frac{5}{6}$ km. How far are both hikes?

2. A roll starts with $5\frac{1}{6}$ m. Cut off $2\frac{3}{4}$ m. How much remains?

3. Two containers need $2\frac{5}{6}$ L and $1\frac{3}{4}$ L. You have $4\frac{1}{2}$ L. Is there enough? Find any leftover or shortfall.

4. Two boards together are $5\frac{1}{4}$ m. One is $2\frac{3}{8}$ m. Find the other board.

5. Plan A uses $1\frac{7}{8}$ m plus $2\frac{1}{4}$ m of fabric. Plan B uses $4\frac{1}{2}$ m. Which plan uses less, and by how much?

6. A cook has $4\frac{1}{4}$ cups of flour. Use $1\frac{2}{3}$ cups, then add $2\frac{1}{2}$ cups. Find the final amount.

7. A tub holds $6\frac{1}{6}$ L after $2\frac{3}{4}$ L was poured out. How much did it hold before?

8. A path needs $6\frac{1}{2}$ m of edging. Two pieces are $2\frac{1}{4}$ m and $1\frac{7}{8}$ m. What third length finishes the path exactly?

Answer Key

1. $6\,\frac{7}{12}$ km.
2. $2\,\frac{5}{12}$ m.
3. No; $\frac{1}{12}$ L short.
4. $2\,\frac{7}{8}$ m.
5. Plan A; $\frac{3}{8}$ m less.
6. $5\frac{1}{12}$ cups.
7. $8\,\frac{11}{12}$ L.
8. $2\frac{3}{8}$ m.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Convert to improper fractions: $3\,\frac{3}{4} = \frac{15}{4}$ and $2\,\frac{5}{6} = \frac{17}{6}$.
2. A common denominator is 12: $\frac{15}{4} = \frac{45}{12}$ and $\frac{17}{6} = \frac{34}{12}$.
3. $\frac{15}{4} + \frac{17}{6} = \frac{45+34}{12} = \frac{79}{12}$.
4. Rename the result: $\frac{79}{12} = 6\,\frac{7}{12}$ km.

Problem 2

1. Convert to improper fractions: $5\,\frac{1}{6} = \frac{31}{6}$ and $2\,\frac{3}{4} = \frac{11}{4}$.
2. A common denominator is 12: $\frac{31}{6} = \frac{62}{12}$ and $\frac{11}{4} = \frac{33}{12}$.
3. $\frac{31}{6} - \frac{11}{4} = \frac{62-33}{12} = \frac{29}{12}$.
4. Rename the result: $\frac{29}{12} = 2\,\frac{5}{12}$ m.

Problem 3

1. Total needed: $\frac{34}{12} + \frac{21}{12} = \frac{55}{12}$ L.
2. Available: $4\frac{1}{2} = \frac{54}{12}$ L.
3. $\frac{55}{12} - \frac{54}{12} = \frac{1}{12}$ L short.

Problem 4

1. Subtract the known board length from the total.
2. Convert to improper fractions: $5\,\frac{1}{4} = \frac{21}{4}$ and $2\,\frac{3}{8} = \frac{19}{8}$.
3. A common denominator is 8: $\frac{21}{4} = \frac{42}{8}$ and $\frac{19}{8} = \frac{19}{8}$.
4. $\frac{21}{4} - \frac{19}{8} = \frac{42-19}{8} = \frac{23}{8}$.
5. Rename the result: $\frac{23}{8} = 2\,\frac{7}{8}$ m.

Problem 5

1. A uses $\frac{15}{8} + \frac{18}{8} = \frac{33}{8} = 4\frac{1}{8}$ m.
2. B uses $4\frac{1}{2} = \frac{36}{8}$ m.
3. A uses $\frac{36}{8} - \frac{33}{8} = \frac{3}{8}$ m less.

Problem 6

1. After use: $\frac{51}{12} - \frac{20}{12} = \frac{31}{12}$ cups.
2. Add $2\frac{1}{2} = \frac{30}{12}$ cups.
3. $\frac{31}{12} + \frac{30}{12} = \frac{61}{12} = 5\frac{1}{12}$ cups.

Problem 7

1. Add back what was poured out.
2. Convert to improper fractions: $6\,\frac{1}{6} = \frac{37}{6}$ and $2\,\frac{3}{4} = \frac{11}{4}$.
3. A common denominator is 12: $\frac{37}{6} = \frac{74}{12}$ and $\frac{11}{4} = \frac{33}{12}$.
4. $\frac{37}{6} + \frac{11}{4} = \frac{74+33}{12} = \frac{107}{12}$.
5. Rename the result: $\frac{107}{12} = 8\,\frac{11}{12}$ L.

Problem 8

1. The first pieces total $\frac{18}{8} + \frac{15}{8} = \frac{33}{8}$ m.
2. The target is $6\frac{1}{2} = \frac{52}{8}$ m.
3. The missing length is $\frac{52}{8} - \frac{33}{8} = \frac{19}{8} = 2\frac{3}{8}$ m.

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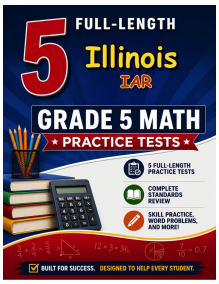

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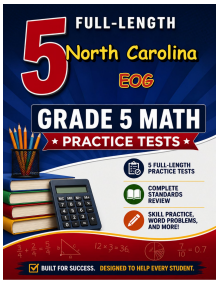

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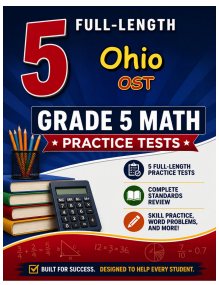

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