Adding and Subtracting Mixed Numbers

Adding and Subtracting Mixed Numbers: Find, Fix, and Work Backward

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

QUICK REVIEW

Check subtraction by adding the difference to the amount removed. For $3\frac{3}{4} - 1\frac{1}{2} = 2\frac{1}{4}$, check $2\frac{1}{4} + 1\frac{1}{2} = 3\frac{3}{4}$. If a fractional part is too small to subtract from, regroup; do not reverse the subtraction.

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 student finds $4\frac{1}{4} - 1\frac{2}{3}$ by subtracting $4 - 1$ and then $\frac{2}{3} - \frac{1}{4}$. Explain the error and find the correct difference.

2. Find the missing addend: $2\frac{5}{6} + \square = 6\frac{1}{4}$.

3. Find the starting value in $\square - 1\frac{3}{4} = 2\frac{3}{8}$.

4. A student says $3\frac{7}{8} - 2\frac{3}{8} = 1\frac{4}{8}$. Is the value correct? Give it in simplest form and check by addition.

5. One result is $5\frac{1}{4} - 2\frac{2}{3}$. Another is $2\frac{1}{2}$. Are they equal? If not, find the difference.

6. Complete $5\frac{1}{6} - \square = 2\frac{3}{4}$.

7. A sum is $5\frac{1}{2}$. Both addends must be mixed numbers in fourths, and the first must have whole part 2. Give one pair and show the total.

8. Starting at $2\frac{5}{6}$, add $1\frac{2}{3}$ and then subtract $1\frac{2}{3}$. Explain why you can give the result without finding the sum.

Answer Key

1. $2\frac{7}{12}$.
2. $3\frac{5}{12}$.
3. $4\frac{1}{8}$.
4. Yes; $1\frac{1}{2}$.
5. No; the first is larger by $\frac{1}{12}$.
6. $2\frac{5}{12}$.
7. For example, $2\frac{1}{4}$ and $3\frac{1}{4}$.
8. $2\frac{5}{6}$, unchanged.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The fractions were reversed. Subtract $\frac{2}{3}$ from $\frac{1}{4}$ as part of the entire mixed-number subtraction.
2. Convert to improper fractions: $4\frac{1}{4} = \frac{17}{4}$ and $1\frac{2}{3} = \frac{5}{3}$.
3. A common denominator is 12: $\frac{17}{4} = \frac{51}{12}$ and $\frac{5}{3} = \frac{20}{12}$.
4. $\frac{17}{4} - \frac{5}{3} = \frac{51-20}{12} = \frac{31}{12}$.
5. Rename the result: $\frac{31}{12} = 2\frac{7}{12}$.

Problem 2

1. Subtract the known addend from the sum.
2. Convert to improper fractions: $6\frac{1}{4} = \frac{25}{4}$ and $2\frac{5}{6} = \frac{17}{6}$.
3. A common denominator is 12: $\frac{25}{4} = \frac{75}{12}$ and $\frac{17}{6} = \frac{34}{12}$.
4. $\frac{25}{4} - \frac{17}{6} = \frac{75-34}{12} = \frac{41}{12}$.
5. Rename the result: $\frac{41}{12} = 3\frac{5}{12}$.

Problem 3

1. Undo the subtraction by adding $1\frac{3}{4}$ to $2\frac{3}{8}$.
2. Convert to improper fractions: $2\frac{3}{8} = \frac{19}{8}$ and $1\frac{3}{4} = \frac{7}{4}$.
3. A common denominator is 8: $\frac{19}{8} = \frac{19}{8}$ and $\frac{7}{4} = \frac{14}{8}$.
4. $\frac{19}{8} + \frac{7}{4} = \frac{19+14}{8} = \frac{33}{8}$.
5. Rename the result: $\frac{33}{8} = 4\frac{1}{8}$.

Problem 4

1. Whole parts: $3 - 2 = 1$. Eighths: $\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$.
2. Check: $1\frac{1}{2} + 2\frac{3}{8} = 3 + \frac{4}{8} + \frac{3}{8} = 3\frac{7}{8}$.

Problem 5

1. The first is $\frac{63}{12} - \frac{32}{12} = \frac{31}{12}$.
2. The second is $\frac{30}{12}$.
3. $\frac{31}{12} - \frac{30}{12} = \frac{1}{12}$.

Problem 6

1. The amount removed is the starting value minus the difference.
2. Convert to improper fractions: $5\frac{1}{6} = \frac{31}{6}$ and $2\frac{3}{4} = \frac{11}{4}$.
3. A common denominator is 12: $\frac{31}{6} = \frac{62}{12}$ and $\frac{11}{4} = \frac{33}{12}$.
4. $\frac{31}{6} - \frac{11}{4} = \frac{62-33}{12} = \frac{29}{12}$.
5. Rename the result: $\frac{29}{12} = 2\frac{5}{12}$.

Problem 7

1. Write the target as $\frac{22}{4}$. Choose $2\frac{1}{4} = \frac{9}{4}$.
2. The other addend is $\frac{22}{4} - \frac{9}{4} = \frac{13}{4} = 3\frac{1}{4}$.
3. Both meet the conditions and $\frac{9}{4} + \frac{13}{4} = \frac{22}{4}$.

Problem 8

1. The added and subtracted amounts are identical: $1\frac{2}{3} - 1\frac{2}{3} = 0$.
2. The net change is 0, so the starting value is also the final value.

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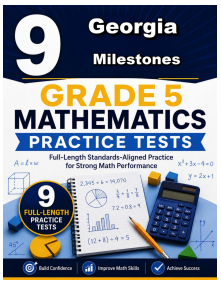

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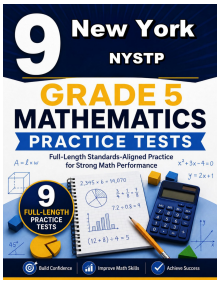

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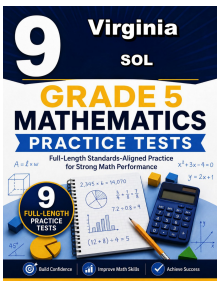

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