Subtracting Fractions with Unlike Denominators

Subtracting Fractions with Unlike Denominators: Find, Fix, and Work Backward

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

QUICK REVIEW

Subtract equal-sized parts. For $\frac{5}{6} - \frac{1}{4}$, write $\frac{10}{12} - \frac{3}{12} = \frac{7}{12}$. Keep the denominator. Check by adding the difference to the subtracted fraction: $\frac{7}{12} + \frac{1}{4} = \frac{5}{6}$.

Worked example

Calculate $\frac{7}{8} - \frac{1}{6}$. Show the place-value or fraction calculation.

1. A common denominator is 24: $\frac{7}{8} = \frac{21}{24}$ and $\frac{1}{6} = \frac{4}{24}$.
2. $\frac{7}{8} - \frac{1}{6} = \frac{21-4}{24} = \frac{17}{24}$.
3. Simplify to $\frac{17}{24}$; check $\frac{17}{24} + \frac{1}{6} = \frac{7}{8}$.

Answer: $\frac{17}{24}$.

Practice Problems

Show your thinking.

1. A student writes $\frac{11}{12} - \frac{1}{3} = \frac{13}{12}$. Correct the result and check it.

2. Find the missing number: $\square - \frac{2}{5} = \frac{3}{5}$. Check by substitution.

3. Find the missing number: $\frac{25}{24} - \square = \frac{19}{24}$. Check by substitution.

4. A recorded result for $\frac{29}{30} - \frac{1}{2}$ is $\frac{19}{30}$. By exactly how much, and in which direction, must that record change? Give the repaired equation.

5. Complete the two-output table for the rule: input $-\frac{3}{8}$. Inputs are $\frac{13}{12}$ and $\frac{13}{6}$. Compare the outputs.

Input	Output
$\frac{13}{12}$	
$\frac{13}{6}$	

6. Find the missing number: $\square - \frac{1}{6} = \frac{2}{3}$. Check by substitution.

7. Is $\frac{16}{15} - \frac{2}{5}$ greater than, less than, or equal to $\frac{11}{12}$? Find the exact gap.

8. Find the missing number: $\frac{17}{18} - \square = \frac{11}{18}$. Check by substitution.

Answer Key

1. $\frac{7}{12}$, not $\frac{13}{12}$.
2. 1.
3. $\frac{1}{4}$.
4. Decrease by $\frac{1}{6}$; $\frac{29}{30} - \frac{1}{2} = \frac{7}{15}$.
5. Outputs $\frac{17}{24}$ and $\frac{43}{24}$; second minus first is $\frac{13}{12}$.
6. $\frac{5}{6}$.
7. Less than by $\frac{1}{4}$.
8. $\frac{1}{3}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. A common denominator is 12: $\frac{11}{12} = \frac{11}{12}$ and $\frac{1}{3} = \frac{4}{12}$.
2. $\frac{11}{12} - \frac{1}{3} = \frac{11-4}{12} = \frac{7}{12}$.
3. Simplify to $\frac{7}{12}$; check $\frac{7}{12} + \frac{1}{3} = \frac{11}{12}$.
4. The claimed value differs by $\frac{1}{2}$, so it fails the exact calculation.

Problem 2

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

Problem 3

1. Undo the known operation to find the missing value: $\frac{25}{24} - \frac{19}{24} = \frac{1}{4}$.
2. A common denominator is 24: $\frac{25}{24} = \frac{25}{24}$ and $\frac{1}{4} = \frac{6}{24}$.
3. $\frac{25}{24} - \frac{1}{4} = \frac{25-6}{24} = \frac{19}{24}$.
4. Simplify to $\frac{19}{24}$; check $\frac{19}{24} + \frac{1}{4} = \frac{25}{24}$.

Problem 4

1. A common denominator is 30: $\frac{29}{30} = \frac{29}{30}$ and $\frac{1}{2} = \frac{15}{30}$.
2. $\frac{29}{30} - \frac{1}{2} = \frac{29-15}{30} = \frac{14}{30}$.
3. Simplify to $\frac{7}{15}$; check $\frac{7}{15} + \frac{1}{2} = \frac{29}{30}$.
4. The correction is $\frac{19}{30} - \frac{7}{15} = \frac{1}{6}$, so subtract that amount from the record.

Problem 5

1. A common denominator is 24: $\frac{13}{12} = \frac{26}{24}$ and $\frac{3}{8} = \frac{9}{24}$.
2. $\frac{13}{12} - \frac{3}{8} = \frac{26-9}{24} = \frac{17}{24}$.
3. Simplify to $\frac{17}{24}$; check $\frac{17}{24} + \frac{3}{8} = \frac{13}{12}$.
4. Second output: $\frac{13}{6} - \frac{3}{8} = \frac{43}{24}$; difference $\frac{43}{24} - \frac{17}{24} = \frac{13}{12}$.

Problem 6

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

Problem 7

1. A common denominator is 15: $\frac{16}{15} = \frac{16}{15}$ and $\frac{2}{5} = \frac{6}{15}$.
2. $\frac{16}{15} - \frac{2}{5} = \frac{16-6}{15} = \frac{10}{15}$.
3. Simplify to $\frac{2}{3}$; check $\frac{2}{3} + \frac{2}{5} = \frac{16}{15}$.
4. $\frac{11}{12} - \frac{2}{3} = \frac{1}{4}$, so the expression is smaller.

Problem 8

1. Undo the known operation to find the missing value: $\frac{17}{18} - \frac{11}{18} = \frac{1}{3}$.
2. A common denominator is 18: $\frac{17}{18} = \frac{17}{18}$ and $\frac{1}{3} = \frac{6}{18}$.
3. $\frac{17}{18} - \frac{1}{3} = \frac{17-6}{18} = \frac{11}{18}$.
4. Simplify to $\frac{11}{18}$; check $\frac{11}{18} + \frac{1}{3} = \frac{17}{18}$.

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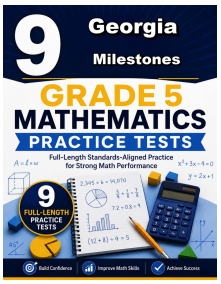

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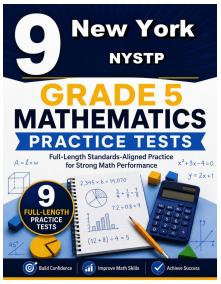

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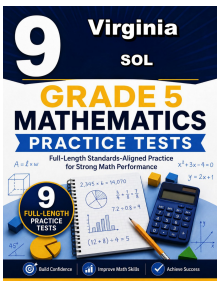

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