Adding Fractions with Unlike Denominators

Adding Fractions with Unlike Denominators: Models and Computation

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

QUICK REVIEW

Add equal-sized parts, not denominators. For $\frac{1}{4} + \frac{1}{6}$, use twelfths: $\frac{3}{12} + \frac{2}{12} = \frac{5}{12}$. Keep the common denominator and simplify. A result greater than 1 may be written as a mixed number.

Worked example

Calculate $\frac{2}{5} + \frac{1}{6}$. Show the place-value or fraction calculation.

1. A common denominator is 30: $\frac{2}{5} = \frac{12}{30}$ and $\frac{1}{6} = \frac{5}{30}$.
2. $\frac{2}{5} + \frac{1}{6} = \frac{12+5}{30} = \frac{17}{30}$.
3. Simplify to $\frac{17}{30}$; check $\frac{17}{30} - \frac{1}{6} = \frac{2}{5}$.
Answer: $\frac{17}{30}$.

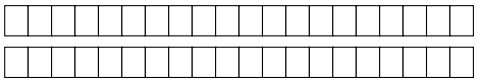
Practice Problems

Show your thinking.

1. Calculate $\frac{1}{2} + \frac{1}{3}$. Show the place-value or fraction calculation.

2. Use the strips to show $\frac{3}{4} + \frac{2}{5}$. Shade the first addend, then mark the second in unused cells. Find the sum.

Each strip is one whole



3. A container holds $\frac{5}{6}$ L. Another $\frac{1}{4}$ L is added. How much is in the container now?

4. Use an inverse operation to verify a proposed result of $\frac{25}{24}$ for $\frac{2}{3} + \frac{3}{8}$. Show both computations.

5. Find the missing number: $\frac{3}{5} + \square = \frac{13}{10}$. Check by substitution.

6. A student writes $\frac{1}{6} + \frac{2}{9} = \frac{8}{9}$. Correct the result and check it.

7. Is $\frac{7}{12} + \frac{1}{8}$ greater than, less than, or equal to $\frac{23}{24}$? Find the exact gap.

8. Calculate $\frac{4}{5} + \frac{5}{6}$. Show the place-value or fraction calculation.

Answer Key

1. $\frac{5}{6}$.
2. $\frac{23}{20}$.
3. $\frac{13}{12}$ L.
4. The result $\frac{25}{24}$ is correct.
5. $\frac{7}{10}$.
6. $\frac{7}{18}$, not $\frac{8}{9}$.
7. Less than by $\frac{1}{4}$.
8. $\frac{49}{30}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

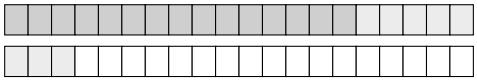
Problem 1

1. A common denominator is 6: $\frac{1}{2} = \frac{3}{6}$ and $\frac{1}{3} = \frac{2}{6}$.
2. $\frac{1}{2} + \frac{1}{3} = \frac{3+2}{6} = \frac{5}{6}$.
3. Simplify to $\frac{5}{6}$; check $\frac{5}{6} - \frac{1}{3} = \frac{1}{2}$.

Problem 2

1. A common denominator is 20: $\frac{3}{4} = \frac{15}{20}$ and $\frac{2}{5} = \frac{8}{20}$.
2. Shade 15 cells for the first amount. Mark the next 8 cells, using the next whole when needed. There are 23 marked cells altogether.

Each strip is one whole



3. $\frac{3}{4} + \frac{2}{5} = \frac{15+8}{20} = \frac{23}{20}$.
4. Simplify to $\frac{23}{20}$; check $\frac{23}{20} - \frac{2}{5} = \frac{3}{4}$.

Problem 3

1. The quantities call for $\frac{5}{6} + \frac{1}{4}$; the result is measured in L.
2. A common denominator is 12: $\frac{5}{6} = \frac{10}{12}$ and $\frac{1}{4} = \frac{3}{12}$.
3. $\frac{5}{6} + \frac{1}{4} = \frac{10+3}{12} = \frac{13}{12}$.
4. Simplify to $\frac{13}{12}$; check $\frac{13}{12} - \frac{1}{4} = \frac{5}{6}$.

Problem 4

1. A common denominator is 24: $\frac{2}{3} = \frac{16}{24}$ and $\frac{3}{8} = \frac{9}{24}$.
2. $\frac{2}{3} + \frac{3}{8} = \frac{16+9}{24} = \frac{25}{24}$.
3. Simplify to $\frac{25}{24}$; check $\frac{25}{24} - \frac{3}{8} = \frac{2}{3}$.
4. Inverse check: $\frac{25}{24} - \frac{3}{8} = \frac{2}{3}$.

Problem 5

1. Undo the known operation to find the missing value: $\frac{13}{10} - \frac{3}{5} = \frac{7}{10}$.
2. A common denominator is 10: $\frac{3}{5} = \frac{6}{10}$ and $\frac{7}{10} = \frac{7}{10}$.
3. $\frac{3}{5} + \frac{7}{10} = \frac{6+7}{10} = \frac{13}{10}$.
4. Simplify to $\frac{13}{10}$; check $\frac{13}{10} - \frac{7}{10} = \frac{3}{5}$.

Problem 6

1. A common denominator is 18: $\frac{1}{6} = \frac{3}{18}$ and $\frac{2}{9} = \frac{4}{18}$.
2. $\frac{1}{6} + \frac{2}{9} = \frac{3+4}{18} = \frac{7}{18}$.
3. Simplify to $\frac{7}{18}$; check $\frac{7}{18} - \frac{2}{9} = \frac{1}{6}$.
4. The claimed value differs by $\frac{1}{2}$, so it fails the exact calculation.

Problem 7

1. A common denominator is 24: $\frac{7}{12} = \frac{14}{24}$ and $\frac{1}{8} = \frac{3}{24}$.
2. $\frac{7}{12} + \frac{1}{8} = \frac{14+3}{24} = \frac{17}{24}$.
3. Simplify to $\frac{17}{24}$; check $\frac{17}{24} - \frac{1}{8} = \frac{7}{12}$.
4. $\frac{23}{24} - \frac{17}{24} = \frac{1}{4}$, so the expression is smaller.

Problem 8

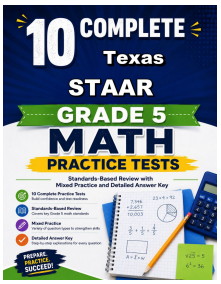
1. A common denominator is 30: $\frac{4}{5} = \frac{24}{30}$ and $\frac{5}{6} = \frac{25}{30}$.
2. $\frac{4}{5} + \frac{5}{6} = \frac{24+25}{30} = \frac{49}{30}$.
3. Simplify to $\frac{49}{30}$; check $\frac{49}{30} - \frac{5}{6} = \frac{4}{5}$.

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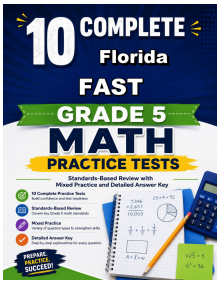
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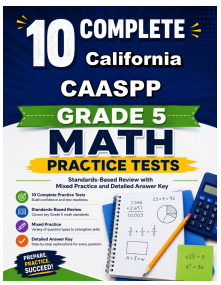
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