Finding Common Denominators

Finding Common Denominators: Models and Computation

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QUICK REVIEW

A common denominator names equal-sized parts. Use a common multiple of the denominators, and multiply numerator and denominator by the same factor. For $\frac{1}{3}$ and $\frac{1}{4}$, the least shared denominator is 12: $\frac{1}{3} = \frac{4}{12}$ and $\frac{1}{4} = \frac{3}{12}$.

Worked example

Find the least common denominator of $\frac{1}{4}$ and $\frac{2}{3}$. Rewrite both fractions.

1. Multiples of 4: $4, 8, 12$; multiples of 3: $3, 6, 9, 12$.
2. The first shared value is 12.
3. Scale both parts of each fraction: $\frac{1}{4} = \frac{3}{12}$ (factor 3); $\frac{2}{3} = \frac{8}{12}$ (factor 4).
Answer: Common denominator 12; $\frac{3}{12}$ and $\frac{8}{12}$.

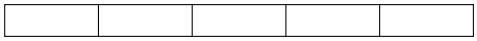
Practice Problems

Show your thinking.

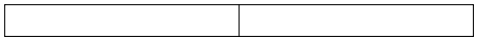
1. Find the least common denominator of $\frac{1}{3}$ and $\frac{3}{4}$. Rewrite both fractions.

2. The strips represent equal wholes. Use the fewest equal pieces per whole that keep both sets of partition lines. Shade $\frac{2}{5}$ on the first and $\frac{1}{2}$ on the second. Label the equivalent fractions.

First whole



Second whole



3. List multiples of 6 and 4 through their first common multiple. Use it to rewrite $\frac{5}{6}$ and $\frac{1}{4}$.

4. Complete both numerators: $\frac{3}{8} = \frac{\square}{24}$ and $\frac{2}{3} = \frac{\square}{24}$. Explain the scale factors.

5. Two measurements are $\frac{1}{6}$ cup and $\frac{3}{10}$ cup. Rewrite both in cups using the least common denominator; do not add them yet.

6. A student changes $\frac{3}{4}$ into $\frac{3}{20}$ without changing its numerator. Correct the equivalent fraction and also rewrite $\frac{2}{5}$.

7. For $\frac{1}{2}$ and $\frac{5}{8}$, decide whether 8 or 9 is a common denominator. Rewrite both using the valid choice.

8. Find the least common denominator of $\frac{2}{3}$ and $\frac{7}{12}$. Rewrite both fractions.

Answer Key

1. Common denominator 12; $\frac{4}{12}$ and $\frac{9}{12}$.
2. Common denominator 10; $\frac{4}{10}$ and $\frac{5}{10}$.
3. Common denominator 12; $\frac{10}{12}$ and $\frac{3}{12}$.
4. Common denominator 24; $\frac{9}{24}$ and $\frac{16}{24}$.
5. Least common denominator 30: $\frac{5}{30}$ cup and $\frac{9}{30}$ cup.
6. Common denominator 20; $\frac{15}{20}$ and $\frac{8}{20}$.
7. Common denominator 8; $\frac{4}{8}$ and $\frac{5}{8}$.
8. Common denominator 12; $\frac{8}{12}$ and $\frac{7}{12}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Multiples of 3: $3, 6, 9, 12$; multiples of 4: $4, 8, 12$.

2. The first shared value is 12.

3. Scale both parts of each fraction: $\frac{1}{3} = \frac{4}{12}$ (factor 4); $\frac{3}{4} = \frac{9}{12}$ (factor 3).

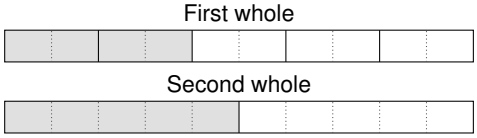
Problem 2

1. Multiples of 5: $5, 10$; multiples of 2: $2, 4, 6, 8, 10$.

2. The first shared count is 10 pieces per whole. Split each first-strip part into 2, and each second-strip part into 5.

3. Shade $2 \times 2 = 4$ new pieces in the first and $1 \times 5 = 5$ in the second.

4. The shading represents the same fractions in both models. Dots mark new divisions.



Problem 3

1. Multiples of 6: $6, 12$; multiples of 4: $4, 8, 12$.

2. The first shared value is 12.

3. Scale both parts of each fraction: $\frac{5}{6} = \frac{10}{12}$ (factor 2); $\frac{1}{4} = \frac{3}{12}$ (factor 3).

Problem 4

1. Multiples of 8: $8, 16, 24$; multiples of 3: $3, 6, 9, 12, 15, 18, 21, 24$.

2. The first shared value is 24.

3. Scale both parts of each fraction: $\frac{3}{8} = \frac{9}{24}$ (factor 3); $\frac{2}{3} = \frac{16}{24}$ (factor 8).

Problem 5

1. Multiples of 6: $6, 12, 18, 24, 30$; multiples of 10: $10, 20, 30$.

2. The first shared value is 30.

3. Scale both parts of each fraction: $\frac{1}{6} = \frac{5}{30}$ (factor 5); $\frac{3}{10} = \frac{9}{30}$ (factor 3).

Problem 6

1. Multiples of 4: $4, 8, 12, 16, 20$; multiples of 5: $5, 10, 15, 20$.

2. The first shared value is 20.

3. Scale both parts of each fraction: $\frac{3}{4} = \frac{15}{20}$ (factor 5); $\frac{2}{5} = \frac{8}{20}$ (factor 4).

Problem 7

1. Multiples of 2: $2, 4, 6, 8$; multiples of 8: 8.

2. The first shared value is 8.

3. Scale both parts of each fraction: $\frac{1}{2} = \frac{4}{8}$ (factor 4); $\frac{5}{8} = \frac{5}{8}$ (factor 1).

4. 9 leaves remainder 1 when divided by 2, so it is not a common denominator.

Problem 8

1. Multiples of 3: $3, 6, 9, 12$; multiples of 12: 12.

2. The first shared value is 12.

3. Scale both parts of each fraction: $\frac{2}{3} = \frac{8}{12}$ (factor 4); $\frac{7}{12} = \frac{7}{12}$ (factor 1).

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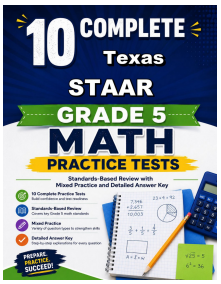

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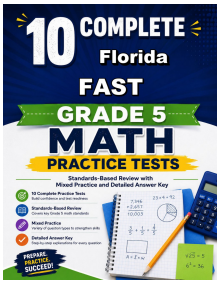

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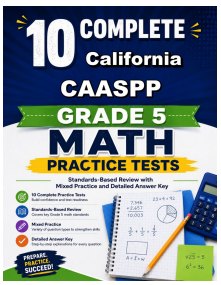

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