

Grade 5 · Adding and Subtracting Fractions with Unlike Denominators · Worksheet Answer Key

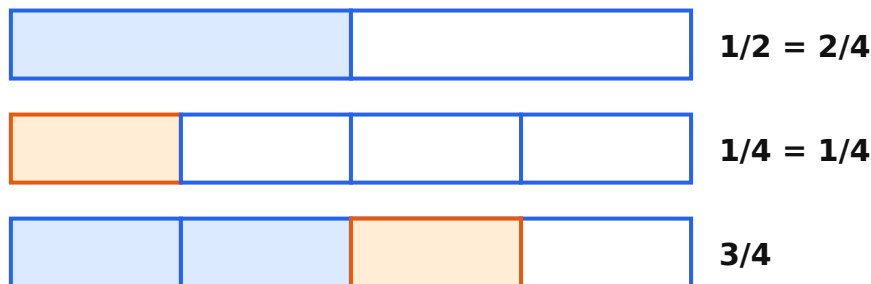
Common Core 5.NF.A.1, 5.NF.A.2 · mathovore.fr

Each problem below has a full worked solution with the final answer in bold. Check the common denominator first, then the renamed fractions, and finally the simplified result. If your answer differs, compare your estimate with the exact value to find the step that went wrong.

Grade 5 Common Core: 5.NF.A.1 · 5.NF.A.2

Problem 1: Add with fraction bars

Fourths are the common unit: $\frac{1}{2} = \frac{2}{4}$. Then $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$.



$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}.$$

Answer: $\frac{3}{4}$

Problem 2: Rename fractions

- a. Multiply top and bottom by 4: $\frac{1}{12} = \frac{4}{48}$. **n = 4**
- b. Multiply top and bottom by 3: $\frac{1}{12} = \frac{3}{36}$. **n = 9**
- c. Multiply top and bottom by 2: $\frac{1}{12} = \frac{2}{24}$. **n = 10**
- d. Multiply top and bottom by 4: $\frac{1}{20} = \frac{4}{80}$. **n = 8**

Problem 3: Find the least common denominator

- a. Multiples of 6 are checked until both 6 and 4 divide evenly: **12**
- b. Multiples of 10 are checked until both 5 and 10 divide evenly: **10**
- c. Multiples of 12 are checked until both 8 and 12 divide evenly: **24**
- d. Multiples of 9 are checked until both 9 and 6 divide evenly: **18**

Problem 4: Add fractions with sums less than 1

- a. $\frac{1}{3} + \frac{1}{3} = \frac{2}{6} + \frac{2}{6} = \frac{4}{6} = \frac{2}{3}$
- b. $\frac{1}{4} + \frac{1}{5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$
- c. $\frac{3}{8} + \frac{1}{4} = \frac{3}{8} + \frac{2}{8} = \frac{5}{8}$
- d. $\frac{2}{9} + \frac{1}{6} = \frac{4}{18} + \frac{3}{18} = \frac{7}{18}$

Problem 5: Add fractions with sums greater than 1

- a. $\frac{2}{3} + \frac{3}{4} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12}$
- b. $\frac{5}{6} + \frac{5}{8} = \frac{20}{24} + \frac{15}{24} = \frac{35}{24} = 1\frac{11}{24}$
- c. $\frac{3}{5} + \frac{7}{10} = \frac{6}{10} + \frac{7}{10} = \frac{13}{10} = 1\frac{3}{10}$
- d. $\frac{7}{12} + \frac{5}{8} = \frac{14}{24} + \frac{15}{24} = \frac{29}{24} = 1\frac{5}{24}$

Problem 6: Subtract fractions with unlike denominators

- a. $\frac{3}{4} - \frac{1}{3} = \frac{9}{12} - \frac{4}{12} = \frac{5}{12}$
- b. $\frac{5}{6} - \frac{1}{4} = \frac{10}{12} - \frac{3}{12} = \frac{7}{12}$
- c. $\frac{7}{8} - \frac{1}{2} = \frac{7}{8} - \frac{4}{8} = \frac{3}{8}$
- d. $\frac{4}{5} - \frac{3}{10} = \frac{8}{10} - \frac{3}{10} = \frac{5}{10} = \frac{1}{2}$

Problem 7: Subtract on a number line

One half is three sixths, so $\frac{5}{6} - \frac{3}{6} = \frac{2}{6} = \frac{1}{3}$. The jump covers two sixths.

Answer: $\frac{1}{3}$

Problem 8: Find the missing fraction

- a. Subtract the known addend: $\frac{7}{12} - \frac{1}{4} = \frac{7}{12} - \frac{3}{12} = \frac{4}{12} = \frac{1}{3}$
- b. Subtract the difference from the starting amount: $\frac{5}{6} - \frac{1}{3} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$
- c. Subtract the difference from the starting amount: $\frac{4}{5} - \frac{1}{10} = \frac{8}{10} - \frac{1}{10} = \frac{7}{10}$
- d. Subtract the known addend: $\frac{9}{10} - \frac{2}{5} = \frac{9}{10} - \frac{4}{10} = \frac{5}{10} = \frac{1}{2}$

Problem 9: Add mixed numbers

- a. $2\frac{1}{2} + 1\frac{1}{3} = \frac{5}{2} + \frac{4}{3} = \frac{15}{6} + \frac{8}{6} = \frac{23}{6} = 3\frac{5}{6}$
- b. $3\frac{1}{4} + 2\frac{2}{5} = \frac{13}{4} + \frac{12}{5} = \frac{65}{20} + \frac{48}{20} = \frac{113}{20} = 5\frac{13}{20}$
- c. $1\frac{3}{4} + 2\frac{1}{2} = \frac{7}{4} + \frac{5}{2} = \frac{7}{4} + \frac{10}{4} = \frac{17}{4} = 4\frac{1}{4}$
- d. $4\frac{5}{6} + 1\frac{3}{8} = \frac{29}{6} + \frac{11}{8} = \frac{116}{24} + \frac{33}{24} = \frac{149}{24} = 6\frac{5}{24}$

Problem 10: Subtract mixed numbers

- a. $5\frac{3}{4} - 2\frac{1}{3} = \frac{23}{4} - \frac{7}{3} = \frac{69}{12} - \frac{28}{12} = \frac{41}{12} = 3\frac{5}{12}$
- b. $6\frac{1}{2} - 2\frac{3}{4} = \frac{13}{2} - \frac{11}{4} = \frac{26}{4} - \frac{11}{4} = \frac{15}{4} = 3\frac{3}{4}$

c. $4\frac{1}{6} - 1\frac{5}{8} = \frac{25}{6} - \frac{13}{8} = \frac{100}{24} - \frac{39}{24} = \frac{61}{24} = 2\frac{13}{24}$
d. $7 - 3\frac{2}{5} = 7 - \frac{17}{5} = \frac{35}{5} - \frac{17}{5} = \frac{18}{5} = 3\frac{3}{5}$

Problem 11: Estimate with benchmarks

- a. Round to benchmarks: $1 + 0 = 1$. The exact value $\frac{39}{40}$ is close. **About 1**
b. Round to benchmarks: $\frac{1}{2} + \frac{1}{2} = 1$. The exact value $\frac{127}{132}$ is close. **About 1**
c. Round to benchmarks: $\frac{1}{2} + 0 = \frac{1}{2}$. The exact value $\frac{31}{56}$ is close. **About $\frac{1}{2}$**
d. Round to benchmarks: $1 - \frac{1}{2} = \frac{1}{2}$. The exact value $\frac{17}{36}$ is close. **About $\frac{1}{2}$**

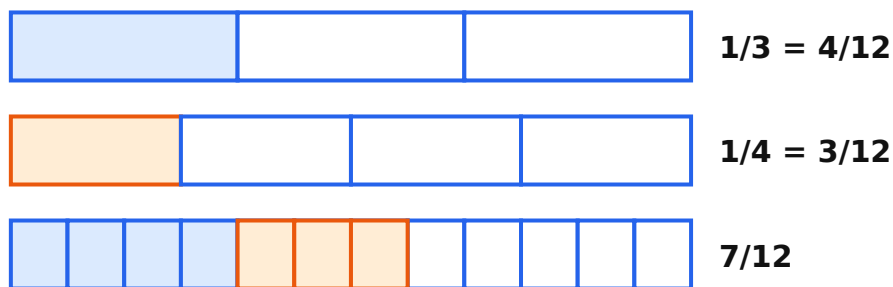
Problem 12: Is the answer reasonable?

A sum must be larger than each addend, but $\frac{3}{5}$ is less than $\frac{2}{3}$. Liam added the numerators and the denominators. Correct work: $\frac{4}{6} + \frac{3}{6}$ uses sixths, so $\frac{2}{3} + \frac{1}{2} = \frac{4}{6} + \frac{3}{6} = \frac{7}{6}$.

Answer: $1\frac{1}{6}$

Problem 13: Add with twelfths bars

$\frac{1}{3} = \frac{4}{12}$ and $\frac{1}{4} = \frac{3}{12}$, so $\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$.



$\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$.

Answer: $\frac{7}{12}$

Problem 14: Compare sums and differences

- a. $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$. Compare in 30ths: $\frac{25}{30} > \frac{24}{30}$. $\frac{5}{6} > \frac{4}{5}$
b. $\frac{3}{4} - \frac{1}{6} = \frac{9}{12} - \frac{2}{12} = \frac{7}{12}$. Compare in 12ths: $\frac{7}{12} > \frac{6}{12}$. $\frac{7}{12} > \frac{1}{2}$
c. $\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$. Compare in 12ths: $\frac{11}{12} = \frac{11}{12}$. $\frac{11}{12} = \frac{11}{12}$
d. $\frac{5}{6} - \frac{1}{3} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$. Compare in 6ths: $\frac{3}{6} < \frac{4}{6}$. $\frac{1}{2} < \frac{2}{3}$

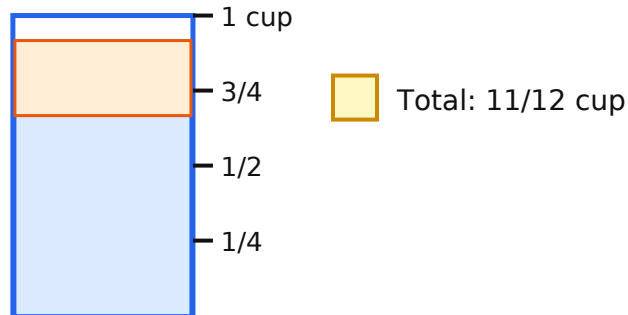
Problem 15: Add three fractions

- a. $\frac{1}{2} + \frac{1}{3} + \frac{1}{6} = \frac{3}{6} + \frac{2}{6} + \frac{1}{6} = \frac{6}{6} = 1$. 1
b. $\frac{1}{4} + \frac{1}{6} + \frac{1}{3} = \frac{3}{12} + \frac{2}{12} + \frac{4}{12} = \frac{9}{12} = \frac{3}{4}$. $\frac{3}{4}$

c. $\frac{2}{5} + \frac{1}{2} + \frac{1}{10} = \frac{4}{10} + \frac{5}{10} + \frac{1}{10} = \frac{10}{10} = 1.1$

Problem 16: Flour and oats

$\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$. The cup is almost full, one twelfth short of 1 cup.



11/12 cup in all.

Answer: $\frac{11}{12}$ cup

Problem 17: Running miles

$\frac{3}{4} + \frac{5}{6} = \frac{9}{12} + \frac{10}{12} = \frac{19}{12} = 1\frac{7}{12}$.

Answer: $1\frac{7}{12}$ miles

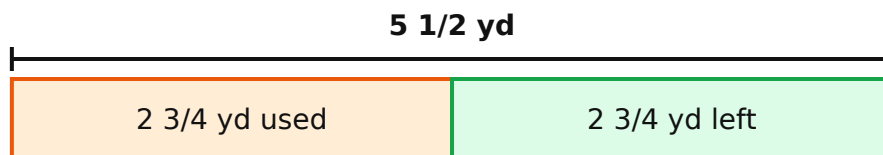
Problem 18: Pizza night

a. $\frac{3}{8} + \frac{1}{4} = \frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

b. $1 - \frac{5}{8} = \frac{8}{8} - \frac{5}{8} = \frac{3}{8}$

Problem 19: Ribbon for a gift

$5\frac{1}{2} - 2\frac{3}{4} = \frac{11}{2} - \frac{11}{4} = \frac{22}{4} - \frac{11}{4} = \frac{11}{4} = 2\frac{3}{4}$.



Used and left parts are equal.

Answer: $2\frac{3}{4}$ yards

Problem 20: Walk to the park

- a. $2\frac{1}{3}$ rounds to $2\frac{1}{2}$ and $1\frac{7}{8}$ rounds to 2, so the total is about $2\frac{1}{2} + 2 = 4\frac{1}{2}$. **About 4 1/2 miles**
- b. $2\frac{1}{3} + 1\frac{7}{8} = \frac{7}{3} + \frac{15}{8} = \frac{56}{24} + \frac{45}{24} = \frac{101}{24} = 4\frac{5}{24}$. **$4\frac{5}{24}$ miles.** This is close to the estimate.

Problem 21: Flour and sugar

$$4\frac{1}{4} - 2\frac{2}{3} = \frac{17}{4} - \frac{8}{3} = \frac{51}{12} - \frac{32}{12} = \frac{19}{12} = 1\frac{7}{12}.$$

Answer: $1\frac{7}{12}$ **cups**

Problem 22: Trail mix

Nuts and raisins: $3\frac{1}{2} + 2\frac{3}{4} = \frac{7}{2} + \frac{11}{4} = \frac{14}{4} + \frac{11}{4} = \frac{25}{4} = 6\frac{1}{4}$. Chips: $10 - 6\frac{1}{4} = 10 - \frac{25}{4} = \frac{40}{4} - \frac{25}{4} = \frac{15}{4} = 3\frac{3}{4}$.

Answer: $3\frac{3}{4}$ **pounds**

Problem 23: Homework time

- a. $1\frac{1}{4} + \frac{3}{4} + 1\frac{1}{2} = \frac{5}{4} + \frac{3}{4} + \frac{3}{2} = \frac{5}{4} + \frac{3}{4} + \frac{6}{4} = \frac{14}{4} = \frac{7}{2} = 3\frac{1}{2}$. **$3\frac{1}{2}$ hours**
- b. $4 - 3\frac{1}{2} = 4 - \frac{7}{2} = \frac{8}{2} - \frac{7}{2} = \frac{1}{2}$. **$\frac{1}{2}$ hour**