

Adding and Subtracting Fractions: practice solutions, Grade 5 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Missing numbers in equivalent fractions



a. $5 \times 4 = 20$, so $3 \times 4 = 12$: $\frac{3}{5} = \frac{12}{20}$.

b. $7 \times 3 = 21$, so $8 \times 3 = 24$: $\frac{7}{8} = \frac{21}{24}$.

c. $9 \times 5 = 45$, so $4 \times 5 = 20$: $\frac{4}{9} = \frac{20}{45}$.

d. $10 \div 5 = 2$, so $15 \div 5 = 3$: $\frac{10}{15} = \frac{2}{3}$.

2 Simplify the fractions



Divide the numerator and denominator by their greatest common factor.

a. GCF is 6: $\frac{12}{18} = \frac{2}{3}$.

b. GCF is 5: $\frac{15}{25} = \frac{3}{5}$.

c. GCF is 9: $\frac{18}{45} = \frac{2}{5}$.

d. GCF is 4: $\frac{28}{16} = \frac{7}{4} = 1\frac{3}{4}$.

3 Least common multiples



- a. Multiples of **6**: **6, 12**. **12** is divisible by **4**. LCM = **12**.
- b. Multiples of **8**: **8, 16, 24**. Only **24** is divisible by **3**. LCM = **24**.
- c. Multiples of **9**: **9, 18**. **18** is divisible by **6**. LCM = **18**.
- d. **10** is a multiple of **5**. LCM = **10**.
- e. Multiples of **12**: **12, 24**. **24** is divisible by **8**. LCM = **24**.

4 Easy sums with one common denominator



- a. $\frac{1}{2} = \frac{2}{4}$, so $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$.
- b. $\frac{2}{3} = \frac{4}{6}$, so $\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$.
- c. $\frac{1}{5} = \frac{2}{10}$, so $\frac{3}{10} + \frac{2}{10} = \frac{5}{10} = \frac{1}{2}$.

5 Easy differences



- a. Five sixths are shaded and two are crossed out: $\frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$. This is the same as $\frac{5}{6} - \frac{1}{3}$.
- b. $\frac{1}{4} = \frac{2}{8}$, so $\frac{7}{8} - \frac{2}{8} = \frac{5}{8}$.
- c. $\frac{2}{5} = \frac{4}{10}$, so $\frac{9}{10} - \frac{4}{10} = \frac{5}{10} = \frac{1}{2}$.

6 True or false?



a. True: multiply the numerator and denominator of $\frac{2}{3}$ by 3 to get $\frac{6}{9}$.

b. False: $\frac{3}{4} = \frac{15}{20}$ but $\frac{4}{5} = \frac{16}{20}$.

c. True: divide the numerator and denominator of $\frac{5}{10}$ by 5.

d. False: $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$. Adding numerators and denominators is not allowed.

7 Juice in the pitcher



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

Answer: there are $\frac{3}{4}$ liter (750 milliliters) of juice in the pitcher.

8 Which is greater?



a. $\frac{3}{4} = \frac{6}{8}$ and $6 > 5$, so $\frac{3}{4} > \frac{5}{8}$.

b. The LCM of 10 and 3 is 30: $\frac{7}{10} = \frac{21}{30}$ and $\frac{2}{3} = \frac{20}{30}$. Since $21 > 20$, $\frac{7}{10} > \frac{2}{3}$.

9 Sums with unlike denominators



a. LCM = 20: $\frac{8}{20} + \frac{15}{20} = \frac{23}{20} = 1\frac{3}{20}$.

b. LCM = 24: $\frac{20}{24} + \frac{9}{24} = \frac{29}{24} = 1\frac{5}{24}$.

10 Differences with unlike denominators



a. LCM = 18: $\frac{14}{18} - \frac{3}{18} = \frac{11}{18}$.

b. LCM = 24: $\frac{22}{24} - \frac{9}{24} = \frac{13}{24}$.

11 Adding mixed numbers



a. Wholes: $2 + 1 = 3$. Fractions: $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$. Total: $3\frac{5}{6}$.

b. Wholes: $3 + 2 = 5$. Fractions: $\frac{9}{12} + \frac{8}{12} = \frac{17}{12} = 1\frac{5}{12}$. Total: $5 + 1\frac{5}{12} = 6\frac{5}{12}$.

12 Subtracting mixed numbers



a. $5\frac{3}{6} - 2\frac{2}{6} = 3\frac{1}{6}$.

b. $4\frac{3}{12} - 1\frac{8}{12}$. Since 3 twelfths is less than 8 twelfths, regroup: $4\frac{3}{12} = 3\frac{15}{12}$. Then $3\frac{15}{12} - 1\frac{8}{12} = 2\frac{7}{12}$.

13 A walk in the park



a. $\frac{3}{4} + \frac{2}{3} = \frac{9}{12} + \frac{8}{12} = \frac{17}{12} = 1\frac{5}{12}$. Leo walks $1\frac{5}{12}$ miles in all.

b. $\frac{9}{12} - \frac{8}{12} = \frac{1}{12}$. He walked $\frac{1}{12}$ mile farther in the morning.

14 Estimate first

a. Estimate: $\frac{5}{8} \approx \frac{1}{2}$ and $\frac{7}{12} \approx \frac{1}{2}$, so the sum is about 1. Exact:

$$\frac{15}{24} + \frac{14}{24} = \frac{29}{24} = 1\frac{5}{24}, \text{ which is close to } 1.$$

b. Estimate: $\frac{13}{15} \approx 1$ and $\frac{4}{9} \approx \frac{1}{2}$, so the difference is about $\frac{1}{2}$. Exact:

$$\frac{39}{45} - \frac{20}{45} = \frac{19}{45}, \text{ which is close to } \frac{1}{2}.$$

15 Three fractions

a. LCM = 12: $\frac{6}{12} + \frac{4}{12} + \frac{3}{12} = \frac{13}{12} = 1\frac{1}{12}.$

b. LCM = 12: $\frac{9}{12} + \frac{10}{12} - \frac{4}{12} = \frac{15}{12} = \frac{5}{4} = 1\frac{1}{4}.$

16 Find the error

a. $\frac{3}{4}$ alone is already more than $\frac{1}{2}$, and $\frac{2}{3}$ is also more than $\frac{1}{2}$, so the sum must be more than 1. But $\frac{5}{7}$ is less than 1 (it is even less than $\frac{3}{4}$), so it cannot be right.

b. Sam added the numerators and added the denominators. The pieces (thirds and fourths) are not the same size. Correct: $\frac{8}{12} + \frac{9}{12} = \frac{17}{12} = 1\frac{5}{12}.$

17 Ribbon cutting

Cut pieces: $1\frac{2}{3} + 2\frac{1}{2} = 1\frac{4}{6} + 2\frac{3}{6} = 3\frac{7}{6} = 4\frac{1}{6}$ feet.

Left: $5\frac{1}{4} - 4\frac{1}{6} = 5\frac{3}{12} - 4\frac{2}{12} = 1\frac{1}{12}$ feet.

In inches: $1\frac{1}{12} \times 12 = 13$ inches.

Answer: $1\frac{1}{12}$ feet, or 13 inches, of ribbon are left.

18 Missing fractions



a. $\square = \frac{11}{12} - \frac{3}{8} = \frac{22}{24} - \frac{9}{24} = \frac{13}{24}$.

b. $\square = \frac{1}{3} + \frac{2}{5} = \frac{5}{15} + \frac{6}{15} = \frac{11}{15}$.

19 The community garden



a. Tomatoes and peppers: $\frac{2}{5} + \frac{1}{4} = \frac{8}{20} + \frac{5}{20} = \frac{13}{20}$. Herbs:

$$1 - \frac{13}{20} = \frac{20}{20} - \frac{13}{20} = \frac{7}{20}.$$

b. $\frac{7}{20} \times 40 = 7 \times 2 = 14$. The herbs cover 14 square feet.

20 Training plan



Monday and Tuesday: $2\frac{4}{12} + 1\frac{9}{12} = 3\frac{13}{12} = 4\frac{1}{12}$ miles.

Wednesday: $7 - 4\frac{1}{12} = 6\frac{12}{12} - 4\frac{1}{12} = 2\frac{11}{12}$ miles.

Answer: she must run $2\frac{11}{12}$ miles on Wednesday.

21 A pattern with differences



a. $\frac{5}{20} - \frac{4}{20} = \frac{1}{20}$.

b. $\frac{6}{30} - \frac{5}{30} = \frac{1}{30}$.

c. $\frac{1}{20} + \frac{1}{30} = \left(\frac{1}{4} - \frac{1}{5}\right) + \left(\frac{1}{5} - \frac{1}{6}\right) = \frac{1}{4} - \frac{1}{6}$, because the $\frac{1}{5}$ cancels. That is $\frac{3}{12} - \frac{2}{12} = \frac{1}{12}$.

d. Check: $\frac{3}{60} + \frac{2}{60} = \frac{5}{60} = \frac{1}{12}$. It matches.



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