

Multiplying and Dividing Fractions: practice solutions, Grade 5 – download the PDF

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

1 Fractions as division



A fraction is a division, so $a \div b = \frac{a}{b}$.

a. $3 \div 8 = \frac{3}{8}$.

b. $7 \div 4 = \frac{7}{4} = 1\frac{3}{4}$ because $7 = 4 + 3$.

c. $9 \div 5 = \frac{9}{5} = 1\frac{4}{5}$ because $9 = 5 + 4$.

2 Whole number times fraction



a. $4 \times \frac{1}{5} = \frac{4}{5}$.

b. $3 \times \frac{2}{7} = \frac{6}{7}$.

c. $5 \times \frac{3}{8} = \frac{15}{8} = 1\frac{7}{8}$.

3 Product of two fractions



Multiply the numerators, then the denominators.

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

b. $\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}$.

c. $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$.

4 Sharing juice



Sharing equally is a division: $2 \div 3 = \frac{2}{3}$.

Each friend gets $\frac{2}{3}$ of a liter.

5 Read an area model



The shaded columns are $\frac{3}{5}$ of the width and the shaded row is $\frac{1}{2}$ of the height. The overlap has 3 small rectangles out of $5 \times 2 = 10$.

$$\frac{1}{2} \times \frac{3}{5} = \frac{3}{10}.$$

6 Unit fraction divided by a whole number



Use $\frac{1}{b} \div n = \frac{1}{b \times n}$.

a. $\frac{1}{4 \times 3} = \frac{1}{12}$.

b. $\frac{1}{2 \times 5} = \frac{1}{10}$.

c. $\frac{1}{6 \times 2} = \frac{1}{12}$.

7

Whole number divided by a unit fraction

Use $n \div \frac{1}{b} = n \times b$: each whole holds b pieces.

a. $6 \times 2 = 12$.

b. $3 \times 4 = 12$.

c. $5 \times 3 = 15$.

8

Greater, less, or equal?

a. Less than 8, because $\frac{3}{5} < 1$.

b. Equal to 8, because $\frac{7}{7} = 1$.

c. Greater than 8, because $\frac{9}{4} > 1$ (it is $2\frac{1}{4}$).

d. Less than 8, because $\frac{11}{12} < 1$.

9

Mixed number times fraction

a. $1\frac{1}{2} = \frac{3}{2}$, so $\frac{3}{2} \times \frac{2}{3} = \frac{6}{6} = 1$.

b. $2\frac{1}{4} = \frac{9}{4}$, so $\frac{9}{4} \times \frac{4}{5} = \frac{36}{20} = \frac{9}{5} = 1\frac{4}{5}$.

10

Baking batches

Five groups of $\frac{3}{4}$: $5 \times \frac{3}{4} = \frac{15}{4} = 3\frac{3}{4}$.

Five batches need $3\frac{3}{4}$ cups of flour.

11 Part of a garden



a. $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$ of the garden.

b. $\frac{2}{5} \times 40 = \frac{80}{5} = 16$. Tomatoes cover 16 square yards.

12 Area of a small rectangle



Area = length $\times$ width = $\frac{3}{4} \times \frac{2}{5} = \frac{6}{20} = \frac{3}{10}$.

The tile has an area of $\frac{3}{10}$ square foot.

13 Cutting ribbon



$$\frac{1}{3} \div 4 = \frac{1}{3 \times 4} = \frac{1}{12}.$$

Each piece is $\frac{1}{12}$ yard long.

14 Scoops of flour



Each cup holds 4 scoops, so $6 \div \frac{1}{4} = 6 \times 4 = 24$.

She can fill 24 scoops.

15 Two mixed numbers



Estimate: $2\frac{1}{2} \times 1\frac{1}{3}$ is a bit more than $2\frac{1}{2}$, so it should be between 3 and 4.

$\frac{5}{2} \times \frac{4}{3} = \frac{20}{6} = \frac{10}{3} = 3\frac{1}{3}$. The result is between 3 and 4, so it makes sense.

16 Area of a patio

Convert: $2\frac{1}{4} = \frac{9}{4}$ and $1\frac{2}{3} = \frac{5}{3}$.

$$\frac{9}{4} \times \frac{5}{3} = \frac{45}{12} = \frac{15}{4} = 3\frac{3}{4}.$$

The area is $3\frac{3}{4}$ square feet.

17 Trail mix

Share: $\frac{1}{2} \div 6 = \frac{1}{12}$ pound per hiker.

$$\text{Eaten: } \frac{3}{4} \times \frac{1}{12} = \frac{3}{48} = \frac{1}{16}.$$

Each hiker eats $\frac{1}{16}$ pound.

18 Find the error

She is wrong. She treated the problem as $4 \div 5$. But $\frac{1}{5}$ is a piece, and each whole holds 5 pieces of size $\frac{1}{5}$.

The correct answer is $4 \div \frac{1}{5} = 4 \times 5 = 20$. Check: $20 \times \frac{1}{5} = 4$.

19 Rope pieces

a. $12 \div \frac{1}{3} = 12 \times 3 = 36$ pieces.

b. $\frac{2}{9} \times 36 = \frac{72}{9} = 8$ pieces.

20 A two-part hike

Morning: $\frac{15}{4} \times \frac{2}{5} = \frac{30}{20} = \frac{3}{2}$ miles.

Remaining: $\frac{15}{4} - \frac{3}{2} = \frac{15}{4} - \frac{6}{4} = \frac{9}{4}$ miles.

After lunch: $\frac{1}{3} \times \frac{9}{4} = \frac{9}{12} = \frac{3}{4}$.

Sam hikes $\frac{3}{4}$ mile after lunch.

21 Missing numbers

a. $\frac{3}{8}$ is $\frac{3}{4}$ cut in half, so $\square = \frac{1}{2}$. Check: $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$.

b. The denominator went from 6 to 18, so the missing factor is $\frac{1}{3}$. Check:

$$\frac{5}{6} \times \frac{1}{3} = \frac{5}{18}.$$

c. $\frac{1}{20} = \frac{1}{5 \times 4}$, so $\square = 4$. Check: $\frac{1}{5} \div 4 = \frac{1}{20}$.

22 Does it grow or shrink?

$\frac{7}{6} > 1$, so the first product is greater than $\frac{3}{5}$; $\frac{5}{6} < 1$, so the second is smaller.

$$\frac{3}{5} \times \frac{7}{6} = \frac{21}{30} = \frac{7}{10} \text{ and } \frac{7}{10} > \frac{6}{10}. \quad \frac{3}{5} \times \frac{5}{6} = \frac{15}{30} = \frac{1}{2} \text{ and } \frac{1}{2} < \frac{3}{5}.$$

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