

Introduction to Fractions: practice solutions, Grade 3 – download the PDF

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

1 Name the shaded fraction



The bar has 6 equal parts, so the denominator is 6. Five parts are colored, so the numerator is 5.

The colored part is $\frac{5}{6}$ of the bar.

2 Unit fractions in words



a. The sandwich has 2 equal pieces, so one piece is $\frac{1}{2}$.

b. One of 6 equal parts is $\frac{1}{6}$.

c. Three copies of $\frac{1}{4}$ make $\frac{3}{4}$.

3 Shade the fractions



a. The numerator is 3, so you color 3 parts.

b. $8 - 3 = 5$ parts stay white. The white part is $\frac{5}{8}$ of the strip.

4 Read a number line



Each length is $\frac{1}{4}$. Point A is 3 jumps from 0, so A is at $\frac{3}{4}$. Point B is 1 jump from 0, so B is at $\frac{1}{4}$.

5 Which piece is bigger?



- a. Ines has $\frac{1}{3}$ and Theo has $\frac{1}{6}$. Fewer parts means bigger parts, so Ines has the bigger piece.
- b. The whole cut in 2 gives bigger parts than the whole cut in 8, so $\frac{1}{2} > \frac{1}{8}$.

6 Whole numbers as fractions



A whole is $\frac{n}{n}$, so $1 = \frac{4}{4}$, $1 = \frac{8}{8}$ and $1 = \frac{6}{6}$.
 $\frac{n}{1} = n$, so $\frac{5}{1} = 5$.

7 True or false?



- a. True. All 3 of the 3 equal parts make the whole.
- b. False. Fourths need 4 *equal* parts. These pieces are not the same size.
- c. False. Cutting into 5 parts gives smaller parts than cutting into 4, so $\frac{1}{5} < \frac{1}{4}$.

8 Same denominator



a. The denominators are the same, and $4 > 2$, so $\frac{4}{6} > \frac{2}{6}$.

b. $7 > 5$, so $\frac{5}{8} < \frac{7}{8}$.

With sixths, the order of the numerators 1, 3, 4, 5 gives $\frac{1}{6} < \frac{3}{6} < \frac{4}{6} < \frac{5}{6}$.

9 Same numerator



The numerators are the same, so the smaller denominator gives the greater fraction.

a. $4 < 8$, so $\frac{3}{4} > \frac{3}{8}$.

b. $6 < 8$, so $\frac{5}{6} > \frac{5}{8}$.

The denominators from greatest to least are 6, 4, 3, so the order is $\frac{2}{6} < \frac{2}{4} < \frac{2}{3}$.

10 Equal or not?



a. Yes. The colored parts cover the same length of the bar, so $\frac{2}{3} = \frac{4}{6}$.

b. Cut each half into 3 equal pieces: 1 half becomes 3 sixths, so $\frac{1}{2} = \frac{3}{6}$. Cut each fourth into 2 pieces: 3 fourths become 6 eighths, so $\frac{3}{4} = \frac{6}{8}$.

11 Fractions beyond 1



a. Each jump is $\frac{1}{3}$. P is 5 jumps from 0, so P is at $\frac{5}{3}$. Q is 2 jumps from 0, so Q is at $\frac{2}{3}$.

b. Point P is closer to 2, since $2 = \frac{6}{3}$ and P is only one jump away from it.

12 Crayons in a box



- a. $12 \div 4 = 3$, so $\frac{1}{4}$ of 12 is 3. There are 3 red crayons.
- b. 3 of the 4 groups are not red, so $\frac{3}{4}$ of the crayons are not red. That is $3 \times 3 = 9$ crayons.

13 Slices of banana bread



- a. Nora ate $\frac{3}{8}$ and her brother ate $\frac{2}{8}$.
- b. $3 + 2 = 5$ slices, so together they ate $\frac{5}{8}$ of the loaf.
- c. $8 - 5 = 3$ slices are left, which is $\frac{3}{8}$ of the loaf.

14 Wholes written as fractions



- a. Each whole has 6 sixths, and 2 wholes have $2 \times 6 = 12$ sixths, so $2 = \frac{12}{6}$.
- b. $3 \times 4 = 12$ fourths, so $3 = \frac{12}{4}$.
- c. Each whole has 2 halves, so 4 wholes have $4 \times 2 = 8$ halves. Then $4 = \frac{8}{2}$.

15 Compare to one whole



- a. $\frac{4}{6} = 1$. The fraction $\frac{5}{6}$ is only 5 of 6 parts, so it is less than 1. Therefore $\frac{4}{6} > \frac{5}{6}$.
- b. $\frac{6}{3} = 2$ and $2 = \frac{8}{4}$. Since $8 > 7$ with the same denominator 4, $\frac{7}{4} < \frac{8}{4}$. So $\frac{6}{3} > \frac{7}{4}$.

16 Find the mistake



- a. Leo compares the denominators as if they were the sizes of the pieces. But a greater denominator means the whole is cut into more parts, so each part is smaller.
- b. Take two paper strips of the same length. Fold one into 3 equal parts and the other into 8 equal parts. A third is a long piece and an eighth is a short piece. So $\frac{1}{8} < \frac{1}{3}$.

17 Marbles in a bag



- a. $24 \div 8 = 3$, so one eighth is 3 marbles. Then $\frac{3}{8}$ of 24 is $3 \times 3 = 9$ blue marbles.
- b. $24 \div 6 = 4$, so there are 4 green marbles. The others are $\frac{5}{6}$ of the bag: $5 \times 4 = 20$ marbles are not green.
- c. $24 \div 3 = 8$, so $\frac{2}{3}$ of 24 is $2 \times 8 = 16$ glass marbles.

18 Trail race



The denominators are different, so we write $\frac{3}{4}$ with eighths: cutting each fourth into 2 equal parts gives $\frac{3}{4} = \frac{6}{8}$.

Now we compare $\frac{6}{8}$ and $\frac{5}{8}$. Since $6 > 5$, $\frac{6}{8} > \frac{5}{8}$. Sam ran farther.

19 Find the equal fractions



- a. The colored parts of the first and third bars match, so $\frac{1}{2} = \frac{3}{6}$.
- b. The second and fourth bars match, so $\frac{2}{3} = \frac{4}{6}$.
- c. Same denominator and $3 < 4$, so $\frac{3}{6} < \frac{4}{6}$. Because $\frac{1}{2} = \frac{3}{6}$ and $\frac{2}{3} = \frac{4}{6}$, we get $\frac{1}{2} < \frac{2}{3}$.

20 Ribbon in inches



- a. One piece is $\frac{1}{4}$ of the ribbon. $12 \div 4 = 3$, so it is 3 inches long.
- b. Three pieces are $\frac{3}{4}$ of the ribbon, and $3 \times 3 = 9$, so she uses 9 inches.

21 Paper strip in centimeters



- a. $24 \div 8 = 3$, so one piece is 3 centimeters long.
- b. The blue part is $\frac{5}{8}$ of the strip, and $5 \times 3 = 15$, so it is 15 centimeters.
- c. $8 - 5 = 3$ pieces are red, so $\frac{3}{8}$ of the strip is red.



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