

# Decomposing Fractions

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 24

## Q Quick Review

To **decompose** a fraction means to break it into a sum of smaller fractions that all have the **same denominator**. Think of  $\frac{5}{8}$  as five separate eighths:  $\frac{5}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ . You can also group them in bigger chunks, such as  $\frac{5}{8} = \frac{2}{8} + \frac{3}{8}$ . There is more than one correct way to break a fraction apart — the numerators just have to **add up** to the original numerator, and the denominator stays the same. This same idea helps you break apart **mixed numbers**, like  $1\frac{1}{4} = \frac{4}{4} + \frac{1}{4} = \frac{5}{4}$ .

◇ **Example:** Decompose  $\frac{7}{10}$  into a sum of two fractions with denominator 10.

⇒ We need two numerators that add up to 7, since the original numerator is 7. One easy choice is 4 and 3, because  $4 + 3 = 7$ . Keep the denominator 10 on each piece. So  $\frac{7}{10} = \frac{4}{10} + \frac{3}{10}$ . Other answers like  $\frac{5}{10} + \frac{2}{10}$  would also be correct.

**Answer:**  $\frac{7}{10} = \frac{4}{10} + \frac{3}{10}$

## PRACTICE

Decompose each fraction or mixed number as shown. More than one answer may be correct.

- |  |       |  |       |
|--|-------|--|-------|
| 1. $\frac{3}{5} = \frac{1}{5} + \frac{?}{5}$               | _____ | 11. Decompose $\frac{2}{6}$ into unit fractions  | _____ |
| 2. $\frac{4}{6} = \frac{2}{6} + \frac{?}{6}$               | _____ | 12. $\frac{9}{12} = \frac{6}{12} + \frac{?}{12}$ | _____ |
| 3. $\frac{5}{8} = \frac{3}{8} + \frac{?}{8}$               | _____ | 13. $\frac{7}{8} = \frac{4}{8} + \frac{?}{8}$    | _____ |
| 4. $\frac{7}{12} = \frac{4}{12} + \frac{?}{12}$            | _____ | 14. $\frac{8}{10} = \frac{5}{10} + \frac{?}{10}$ | _____ |
| 5. $\frac{2}{3} = \frac{1}{3} + \frac{?}{3}$               | _____ | 15. Write $1\frac{1}{4}$ as a fraction           | _____ |
| 6. $\frac{6}{10} = \frac{1}{10} + \frac{?}{10}$            | _____ | 16. Write $1\frac{2}{3}$ as a fraction           | _____ |
| 7. $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{?}{4}$ | _____ | 17. Write $2\frac{1}{2}$ as a fraction           | _____ |
| 8. $\frac{5}{6} = \frac{2}{6} + \frac{1}{6} + \frac{?}{6}$ | _____ | 18. Write $1\frac{3}{8}$ as a fraction           | _____ |
| 9. Decompose $\frac{4}{5}$ into unit fractions             | _____ | 19. Write $\frac{7}{4}$ as a mixed number        | _____ |
| 10. Decompose $\frac{3}{8}$ into unit fractions            | _____ | 20. Write $\frac{9}{5}$ as a mixed number        | _____ |

## ◆ Word Problems

21. A chocolate bar is split into 8 equal squares. Maya wants to show that her  $\frac{5}{8}$  of the bar is the same as one piece of  $\frac{2}{8}$  plus another piece. What is the other piece? \_\_\_\_\_
22. Liam jogged  $1\frac{1}{2}$  miles. Write the total distance he jogged as a single fraction. \_\_\_\_\_
23. A pizza is cut into sixths. The Reyes family ate  $\frac{5}{6}$  of it over two meals. If they ate  $\frac{3}{6}$  at dinner, what fraction did they eat at lunch? \_\_\_\_\_
24. A ribbon is  $\frac{11}{4}$  yards long. Write this length as a mixed number so it is easier to picture. \_\_\_\_\_



## Answer Keys

1.  $\frac{2}{5}$

2.  $\frac{2}{6}$

3.  $\frac{2}{8}$

4.  $\frac{3}{12}$

5.  $\frac{1}{3}$

6.  $\frac{5}{10}$

7.  $\frac{1}{4}$

8.  $\frac{2}{6}$

9.  $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$

10.  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8}$

11.  $\frac{1}{6} + \frac{1}{6}$

12.  $\frac{3}{12}$

13.  $\frac{3}{8}$

14.  $\frac{3}{10}$

15.  $\frac{5}{4}$

16.  $\frac{5}{3}$

17.  $\frac{5}{2}$

18.  $\frac{11}{8}$

19.  $1\frac{3}{4}$

20.  $1\frac{4}{5}$

21.  $\frac{3}{8}$

22.  $\frac{3}{2}$  miles

23.  $\frac{2}{6}$  of the pizza

24.  $2\frac{3}{4}$  yards

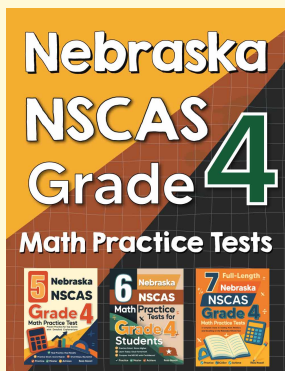
### Step-by-Step Explanations

1. The tops must add to 3. Since  $1 + 2 = 3$ , the missing part is  $\frac{2}{5}$ .
2. The tops must add to 4. Since  $2 + 2 = 4$ , the missing part is  $\frac{2}{6}$ .
3. The tops must add to 5. Since  $3 + 2 = 5$ , the missing part is  $\frac{2}{8}$ .
4. The tops must add to 7. Since  $4 + 3 = 7$ , the missing part is  $\frac{3}{12}$ .
5. The tops must add to 2. Since  $1 + 1 = 2$ , the missing part is  $\frac{1}{3}$ .
6. The tops must add to 6. Since  $1 + 5 = 6$ , the missing part is  $\frac{5}{10}$ .
7. The tops must add to 3. Since  $1 + 1 + 1 = 3$ , the missing part is  $\frac{1}{4}$ .
8. The tops must add to 5. Since  $2 + 1 + 2 = 5$ , the missing part is  $\frac{2}{6}$ .
9. A unit fraction has 1 on top. Four fifths is four copies of  $\frac{1}{5}$ .
10. Three eighths is three copies of the unit fraction  $\frac{1}{8}$ .
11. Two sixths is two copies of the unit fraction  $\frac{1}{6}$ .
12. The tops must add to 9. Since  $6 + 3 = 9$ , the missing part is  $\frac{3}{12}$ .
13. The tops must add to 7. Since  $4 + 3 = 7$ , the missing part is  $\frac{3}{8}$ .

14. The tops must add to 8. Since  $5 + 3 = 8$ , the missing part is  $\frac{3}{10}$ .
15. One whole is  $\frac{4}{4}$ . Add the extra fourth:  $\frac{4}{4} + \frac{1}{4} = \frac{5}{4}$ .
16. One whole is  $\frac{3}{3}$ . Add the extra two thirds:  $\frac{3}{3} + \frac{2}{3} = \frac{5}{3}$ .
17. Two wholes are  $\frac{4}{2}$ . Add the extra half:  $\frac{4}{2} + \frac{1}{2} = \frac{5}{2}$ .
18. One whole is  $\frac{8}{8}$ . Add three eighths:  $\frac{8}{8} + \frac{3}{8} = \frac{11}{8}$ .
19.  $\frac{4}{4}$  makes one whole, leaving  $\frac{3}{4}$ . So  $\frac{7}{4} = 1\frac{3}{4}$ .
20.  $\frac{5}{5}$  makes one whole, leaving  $\frac{4}{5}$ . So  $\frac{9}{5} = 1\frac{4}{5}$ .
21. The two numerators must add to 5. Since  $2 + 3 = 5$ , the other piece is  $\frac{3}{8}$  of the bar.
22. One whole mile is  $\frac{2}{2}$ . Add the extra half:  $\frac{2}{2} + \frac{1}{2} = \frac{3}{2}$  miles.
23. The two parts must add to  $\frac{5}{6}$ . Since  $3 + 2 = 5$ , they ate  $\frac{2}{6}$  at lunch.
24. Every  $\frac{4}{4}$  makes one whole yard.  $\frac{8}{4}$  is 2 yards, leaving  $\frac{3}{4}$ , so the ribbon is  $2\frac{3}{4}$  yards.



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