

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.

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| 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

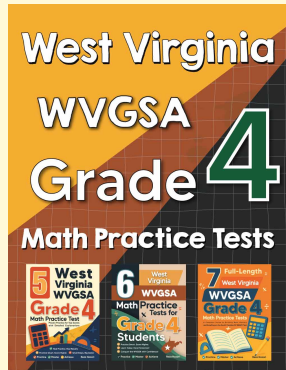
<p>1. $\frac{2}{5}$</p> <p>2. $\frac{2}{6}$</p> <p>3. $\frac{2}{8}$</p> <p>4. $\frac{3}{12}$</p> <p>5. $\frac{1}{3}$</p> <p>6. $\frac{5}{10}$</p> <p>7. $\frac{1}{4}$</p> <p>8. $\frac{2}{6}$</p> <p>9. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$</p> <p>10. $\frac{1}{8} + \frac{1}{8} + \frac{1}{8}$</p> <p>11. $\frac{1}{6} + \frac{1}{6}$</p> <p>12. $\frac{3}{12}$</p>	<p>13. $\frac{3}{8}$</p> <p>14. $\frac{3}{10}$</p> <p>15. $\frac{5}{4}$</p> <p>16. $\frac{5}{3}$</p> <p>17. $\frac{5}{2}$</p> <p>18. $\frac{11}{8}$</p> <p>19. $1\frac{3}{4}$</p> <p>20. $1\frac{4}{5}$</p> <p>21. $\frac{3}{8}$</p> <p>22. $\frac{3}{2}$ miles</p> <p>23. $\frac{2}{6}$ of the pizza</p> <p>24. $2\frac{3}{4}$ yards</p>
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Step-by-Step Explanations

<p>1. The tops must add to 3. Since $1 + 2 = 3$, the missing part is $\frac{2}{5}$.</p> <p>2. The tops must add to 4. Since $2 + 2 = 4$, the missing part is $\frac{2}{6}$.</p> <p>3. The tops must add to 5. Since $3 + 2 = 5$, the missing part is $\frac{2}{8}$.</p> <p>4. The tops must add to 7. Since $4 + 3 = 7$, the missing part is $\frac{3}{12}$.</p> <p>5. The tops must add to 2. Since $1 + 1 = 2$, the missing part is $\frac{1}{3}$.</p> <p>6. The tops must add to 6. Since $1 + 5 = 6$, the missing part is $\frac{5}{10}$.</p> <p>7. The tops must add to 3. Since $1 + 1 + 1 = 3$, the missing part is $\frac{1}{4}$.</p> <p>8. The tops must add to 5. Since $2 + 1 + 2 = 5$, the missing part is $\frac{2}{6}$.</p> <p>9. A unit fraction has 1 on top. Four fifths is four copies of $\frac{1}{5}$.</p> <p>10. Three eighths is three copies of the unit fraction $\frac{1}{8}$.</p> <p>11. Two sixths is two copies of the unit fraction $\frac{1}{6}$.</p> <p>12. The tops must add to 9. Since $6 + 3 = 9$, the missing part is $\frac{3}{12}$.</p> <p>13. The tops must add to 7. Since $4 + 3 = 7$, the missing part is $\frac{3}{8}$.</p>	<p>14. The tops must add to 8. Since $5 + 3 = 8$, the missing part is $\frac{3}{10}$.</p> <p>15. One whole is $\frac{4}{4}$. Add the extra fourth: $\frac{4}{4} + \frac{1}{4} = \frac{5}{4}$.</p> <p>16. One whole is $\frac{3}{3}$. Add the extra two thirds: $\frac{3}{3} + \frac{2}{3} = \frac{5}{3}$.</p> <p>17. Two wholes are $\frac{4}{2}$. Add the extra half: $\frac{4}{2} + \frac{1}{2} = \frac{5}{2}$.</p> <p>18. One whole is $\frac{8}{8}$. Add three eighths: $\frac{8}{8} + \frac{3}{8} = \frac{11}{8}$.</p> <p>19. $\frac{4}{4}$ makes one whole, leaving $\frac{3}{4}$. So $\frac{7}{4} = 1\frac{3}{4}$.</p> <p>20. $\frac{5}{5}$ makes one whole, leaving $\frac{4}{5}$. So $\frac{9}{5} = 1\frac{4}{5}$.</p> <p>21. The two numerators must add to 5. Since $2 + 3 = 5$, the other piece is $\frac{3}{8}$ of the bar.</p> <p>22. One whole mile is $\frac{2}{2}$. Add the extra half: $\frac{2}{2} + \frac{1}{2} = \frac{3}{2}$ miles.</p> <p>23. The two parts must add to $\frac{5}{6}$. Since $3 + 2 = 5$, they ate $\frac{2}{6}$ at lunch.</p> <p>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.</p>
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