

FRACTIONS

WORKSHEETS

Adding, Subtracting, Multiplying, and Dividing

Chris McMullen, Ph.D.

$$\begin{aligned}\frac{3}{8} + \frac{5}{6} &= \frac{3 \times 3}{8 \times 3} + \frac{5 \times 4}{6 \times 4} \\ &= \frac{9}{24} + \frac{20}{24} = \frac{29}{24}\end{aligned}$$

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INTRODUCTION

This fractions resource offers practice performing arithmetic with fractions:

- Examples are fully solved to help serve as a guide.
- Each chapter focuses on a specific arithmetic operation, such as subtracting fractions.
- Chapters 1-4 provide practice adding, subtracting, multiplying, and dividing fractions.
- Chapter 5 includes tips and a little practice with word problems.
- Chapter 6 provides a few problems that may challenge students in various ways.
- The answer key includes the full solution to every problem.
- All of the answers are expressed as reduced fractions.

1 Adding Fractions

Example 1:

$$\frac{1}{2} + \frac{1}{3} = ?$$

To add fractions, first make a common denominator. The multiples of 2 are 2, 4, 6, 8, etc. The multiples of 3 are 3, 6, 9, 12, etc. The lowest common multiple is 6. This is the least common denominator. Multiply the numerator and denominator of $\frac{1}{2}$ each by 3 and multiply the numerator and denominator of $\frac{1}{3}$ each by 2.

$$\frac{1}{2} + \frac{1}{3} = \frac{1 \times 3}{2 \times 3} + \frac{1 \times 2}{3 \times 2} = \frac{3}{6} + \frac{2}{6} = \frac{3 + 2}{6} = \frac{5}{6}$$

Once the fractions have the same denominator, then we may add the numerators together.

Why did we multiply $\frac{1}{2}$ by $\frac{3}{3}$ and multiply $\frac{1}{3}$ by $\frac{2}{2}$? This is how we made a common denominator of 6. Note that $\frac{3}{3} = 1$ and $\frac{2}{2} = 1$. We can multiply any fraction by 1 without changing the value of the fraction. Since $2 \times 3 = 6$, we multiplied $\frac{1}{2}$ by $\frac{3}{3}$ to get $\frac{1 \times 3}{2 \times 3} = \frac{3}{6}$, which has a denominator of 6. The new fraction $\frac{3}{6}$ is equivalent to the old fraction $\frac{1}{2}$; we just changed its denominator. Similarly, since $3 \times 2 = 6$, we multiplied $\frac{1}{3}$ by $\frac{2}{2}$ to get $\frac{1 \times 2}{3 \times 2} = \frac{2}{6}$, which has a denominator of 6. The new fraction $\frac{2}{6}$ is equivalent to the old fraction $\frac{1}{3}$.

Example 2:

$$\frac{2}{9} + \frac{5}{12} = ?$$

To add fractions, first make a common denominator. The multiples of 9 are 9, 18, 27, 36, etc. The multiples of 12 are 12, 24, 36, 48, etc. The lowest common multiple is 36. This is the least common denominator. Multiply the numerator and denominator of $\frac{2}{9}$ each by 4 and multiply the numerator and denominator of $\frac{5}{12}$ each by 3.

$$\frac{2}{9} + \frac{5}{12} = \frac{2 \times 4}{9 \times 4} + \frac{5 \times 3}{12 \times 3} = \frac{8}{36} + \frac{15}{36} = \frac{8 + 15}{36} = \frac{23}{36}$$

Example 3:

$$3 + \frac{2}{5} = ?$$

A whole number like 3 can be expressed as a fraction with a denominator equal to 1. Note that $\frac{3}{1} = 3$. The given problem is the same as the following problem.

$$\frac{3}{1} + \frac{2}{5} = ?$$

To add fractions, first make a common denominator. When one of the denominators is equal to 1, the other denominator will be the least common denominator. In this example, the least common denominator is 5. Multiply the numerator and denominator of $\frac{3}{1}$ each by 5. The other fraction remains the same.

$$\frac{3}{1} + \frac{2}{5} = \frac{3 \times 5}{1 \times 5} + \frac{2}{5} = \frac{15}{5} + \frac{2}{5} = \frac{15 + 2}{5} = \frac{17}{5}$$

Directions: Add the fractions.

Exercise 1.

$$\frac{2}{3} + \frac{1}{5} =$$

Exercise 2.

$$\frac{5}{6} + \frac{1}{9} =$$

Exercise 3.

$$\frac{3}{4} + \frac{5}{3} =$$

Exercise 4.

$$1 + \frac{1}{3} =$$

Exercise 5.

$$\frac{7}{4} + \frac{3}{2} =$$

Exercise 6.

$$\frac{2}{7} + \frac{1}{2} =$$

Exercise 7.

$$\frac{3}{8} + \frac{5}{6} =$$

Directions: Add the fractions.

Exercise 1.

$$\frac{1}{2} + \frac{1}{6} =$$

Exercise 2.

$$\frac{8}{3} + \frac{5}{4} =$$

Exercise 3.

$$\frac{2}{5} + \frac{3}{7} =$$

Exercise 4.

$$\frac{4}{3} + \frac{5}{6} =$$

Exercise 5.

$$\frac{1}{5} + 2 =$$

Exercise 6.

$$\frac{3}{8} + \frac{3}{4} =$$

Exercise 7.

$$\frac{3}{10} + \frac{4}{15} =$$

Directions: Add the fractions.

Exercise 1.

$$\frac{1}{3} + \frac{2}{7} =$$

Exercise 2.

$$\frac{2}{9} + \frac{1}{12} =$$

Exercise 3.

$$\frac{6}{5} + \frac{1}{2} =$$

Exercise 4.

$$\frac{3}{4} + \frac{2}{5} =$$

Exercise 5.

$$\frac{3}{10} + \frac{5}{4} =$$

Exercise 6.

$$4 + \frac{3}{11} =$$

Exercise 7.

$$\frac{3}{4} + \frac{1}{7} =$$

Directions: Add the fractions.

Exercise 1.

$$\frac{5}{8} + \frac{5}{8} =$$

Exercise 2.

$$\frac{5}{8} + \frac{8}{5} =$$

Exercise 3.

$$\frac{5}{12} + \frac{7}{18} =$$

Exercise 4.

$$\frac{9}{4} + \frac{8}{7} =$$

Exercise 5.

$$\frac{9}{16} + \frac{11}{40} =$$

Exercise 6.

$$\frac{3}{2} + \frac{3}{2} =$$

Exercise 7.

$$\frac{8}{27} + \frac{16}{45} =$$