Dividing with Mixed Numbers

To divide with mixed numbers, first change every mixed number to an improper fraction (see page 21). Also, be sure to write whole numbers as fractions over 1. Then invert the fraction to the right of the division sign and finish the problems as on pages 47, 49, and 51.

EXAMPLE $2\frac{1}{3} \div \frac{1}{4} =$

STEP 1 Write $2\frac{1}{3}$ as the improper fraction $\frac{7}{3}$. $\frac{7}{3} \div \frac{1}{4} =$

STEP 2 Invert $\frac{1}{4}$ to $\frac{4}{1}$ and change the ÷ sign to ×. $\frac{7}{3} \times \frac{4}{1} = \frac{28}{3} = \mathbf{9\frac{1}{3}}$

STEP 3 Since nothing can be canceled, multiply across.

STEP 4 Change the improper fraction to a mixed number.

Divide and reduce.

1. $1\frac{1}{2} \div \frac{3}{4} =$ $1\frac{2}{3} \div \frac{2}{3} =$ $2\frac{3}{4} \div \frac{5}{8} =$ $4\frac{1}{3} \div \frac{2}{9} =$

2. $2\frac{2}{5} \div 6 =$ $3\frac{1}{3} \div 4 =$ $1\frac{5}{7} \div 9 =$ $2\frac{2}{9} \div 15 =$

3. $\frac{5}{8} \div 1\frac{1}{4} =$ $\frac{14}{15} \div 1\frac{1}{6} =$ $\frac{7}{12} \div 2\frac{1}{2} =$ $\frac{9}{16} \div 3\frac{3}{4} =$

4. $12 \div 1\frac{3}{5} =$ $20 \div 2\frac{2}{7} =$ $9 \div 1\frac{7}{8} =$ $24 \div 1\frac{7}{11} =$

5. $3\frac{3}{4} \div 1\frac{1}{8} =$ $4\frac{1}{2} \div 1\frac{1}{6} =$ $2\frac{3}{4} \div 1\frac{7}{8} =$ $1\frac{7}{9} \div 2\frac{2}{9} =$

6. $5\frac{1}{4} \div 4\frac{2}{3} =$ $6\frac{1}{2} \div 3\frac{1}{4} =$ $5\frac{3}{5} \div 3\frac{3}{7} =$ $4\frac{3}{8} \div 1\frac{9}{16} =$

7. $5\frac{2}{3} \div 1\frac{8}{9} =$ $4\frac{2}{5} \div 8\frac{4}{5} =$ $3\frac{5}{9} \div 1\frac{13}{15} =$ $10\frac{2}{3} \div 2\frac{2}{3} =$

8. $3\frac{3}{5} \div 1\frac{7}{20} =$ $6\frac{3}{5} \div 2\frac{1}{5} =$ $3\frac{3}{7} \div 1\frac{11}{21} =$ $2\frac{4}{13} \div 2\frac{1}{4} =$

9. $4\frac{1}{3} \div 2\frac{1}{7} =$ $6\frac{7}{8} \div 5\frac{1}{4} =$ $9\frac{7}{10} \div 1\frac{4}{5} =$ $8\frac{2}{3} \div 5\frac{1}{12} =$

10. $7\frac{1}{2} \div 3\frac{1}{5} =$ $3\frac{5}{9} \div 2\frac{5}{18} =$ $5\frac{5}{6} \div 3\frac{5}{12} =$ $10\frac{5}{8} \div 4\frac{1}{2} =$

Finding a Number When a Fraction of It Is Given

There is a kind of division problem that is sometimes hard to recognize. Think about the question: $\frac{1}{2}$ of what number is 12? Without using pencil and paper, you can probably come up with the answer 24. You know that $\frac{1}{2}$ of 24 is 12.

To solve the problem, you find a solution to the statement $\frac{1}{2} \times ? = 12$. The statement asks you to find the missing number in a multiplication problem. Division is the opposite operation of multiplication. To find the missing number, divide 12 by $\frac{1}{2}$.

You will learn more about opposite operations when you study algebra.

EXAMPLE $\frac{1}{2}$ of what number is 12?

STEP 1 Write 12 as the improper fraction $\frac{12}{1}$.

STEP 2 Invert $\frac{1}{2}$ to $\frac{2}{1}$ and change the ÷ sign to ×.

STEP 3 Multiply across.

STEP 4 Change the improper fraction to a whole number.

$$\frac{12}{1} \div \frac{1}{2} =$$

$$\frac{12}{1} \times \frac{2}{1} = \frac{24}{1} = \mathbf{24}$$

Solve.

1. $\frac{1}{3}$ of what number is 5?
2. $\frac{2}{3}$ of what number is 18?
3. $\frac{3}{4}$ of what number is 15?
4. $\frac{2}{5}$ of what number is 30?
5. $\frac{3}{8}$ of what number is 36?
6. $\frac{4}{5}$ of what number is 80?
7. $\frac{3}{10}$ of what number is 45?

$\frac{1}{4}$ of what number is 22?

$\frac{5}{6}$ of what number is 60?

$\frac{5}{8}$ of what number is 40?

$\frac{7}{12}$ of what number is 14?

$\frac{1}{6}$ of what number is 11?

$\frac{8}{9}$ of what number is 32?

$\frac{7}{12}$ of what number is 35?