



6-4 Dividing Fractions (Pages 289–293)

Two numbers whose product is 1 are **multiplicative inverses**, or **reciprocals** of each other. For example, 2 and $\frac{1}{2}$ are reciprocals of each other since $2 \times \frac{1}{2} = 1$.

Inverse Property of Multiplication	For every nonzero number $\frac{a}{b}$ where $a, b \neq 0$, there is exactly one number $\frac{b}{a}$ such that $\frac{a}{b} \cdot \frac{b}{a} = 1$.
Division with Fractions	To divide by a fraction, multiply by its multiplicative inverse. For fractions $\frac{a}{b}$ and $\frac{c}{d}$, where b, c , and $d \neq 0$, $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$.

EXAMPLES

A Solve $d = \frac{1}{2} \div \frac{7}{8}$.

$$\begin{aligned} d &= \frac{1}{2} \div \frac{7}{8} \\ &= \frac{1}{2} \cdot \frac{8}{7} \quad \frac{8}{7} \text{ is the multiplicative inverse of } \frac{7}{8}. \\ &= \frac{1 \cdot 8^4}{2 \cdot 7} \text{ or } \frac{4}{7} \end{aligned}$$

B Solve $g = \frac{5}{6} \div 1\frac{1}{2}$.

$$\begin{aligned} g &= \frac{5}{6} \div 1\frac{1}{2} \\ &= \frac{5}{6} \div \frac{3}{2} \quad \text{Rename } 1\frac{1}{2} \text{ as } \frac{3}{2}. \\ &= \frac{5}{6} \cdot \frac{2}{3} \quad \frac{2}{3} \text{ is the multiplicative inverse of } \frac{3}{2}. \\ &= \frac{5 \cdot 2^1}{3 \cdot 6 \cdot 3} \text{ or } \frac{5}{9} \end{aligned}$$

PRACTICE

Estimate the solution to each equation. Then solve. Write the solution in simplest form.

1. $p = \frac{6}{10} \div \left(-\frac{5}{8}\right)$
2. $-\frac{19}{21} \div \left(-\frac{3}{7}\right) = w$
3. $r = -\frac{4}{8} \div \frac{9}{16}$
4. $k = -\frac{5}{6} \div \frac{3}{4}$
5. $s = -\frac{8}{9} \div \left(-\frac{8}{18}\right)$
6. $7 \div \left(-\frac{8}{10}\right) = b$

7. Evaluate $b - c \div d$ if $b = 1\frac{4}{5}$, $c = 1\frac{1}{3}$, and $d = \frac{5}{8}$.

8. **Pets** Students at Midtown Middle School decided to make and donate dog leashes to people unable to afford them. They had 150 meters of leash rope. Each leash was to be $1\frac{2}{3}$ meters long. How many leashes can the students make?



9. **Standardized Test Practice** Solve $q = \frac{5}{6} \div 1\frac{2}{3}$. Write the solution in simplest form.

- A** $\frac{1}{2}$ **B** $\frac{18}{25}$ **C** $1\frac{7}{18}$ **D** 2

Answers: 1. $-\frac{25}{24}$ 2. $2\frac{2}{3}$ 3. $-\frac{9}{8}$ 4. $-\frac{9}{10}$ 5. 2 6. $-\frac{8}{3}$ 7. $-\frac{3}{1}$ 8. 90 leashes 9. A
