Multiplying and Dividing Fractions

TEKS 7.2.B

To multiply two fractions, write the product of the numerators over the product of the denominators.

Product Rule ($b, d \neq 0$)

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

EXAMPLE **Multiply: $\frac{3}{5} \times \frac{7}{8}$**

$\frac{3}{5} \times \frac{7}{8} = \frac{3 \times 7}{5 \times 8}$ Use product rule.

$= \frac{21}{40}$ Simplify.

Two nonzero numbers whose product is 1 are **reciprocals**. For example, 6 and $\frac{1}{6}$ are reciprocals because $6 \times \frac{1}{6} = 1$. Every number except 0 has a reciprocal.

To divide by a fraction, multiply by its reciprocal.

Quotient Rule ($b, c, d \neq 0$)

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$

EXAMPLE **Divide: $\frac{5}{7} \div \frac{3}{4}$**

The reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$ because $\frac{3}{4} \times \frac{4}{3} = 1$, so multiply $\frac{5}{7}$ by $\frac{4}{3}$.

$\frac{5}{7} \div \frac{3}{4} = \frac{5}{7} \times \frac{4}{3}$ Use quotient rule.

$= \frac{20}{21}$ Use product rule.

PRACTICE

Multiply or divide.

1. $\frac{3}{4} \times \frac{2}{3}$ **2.** $\frac{1}{5} \times \frac{5}{8}$ **3.** $\frac{1}{6} \div \frac{1}{3}$ **4.** $\frac{2}{3} \div \frac{2}{3}$ **5.** $\frac{9}{10} \div \frac{4}{5}$

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

11. $\frac{3}{4} \div \frac{1}{2}$ **12.** $\frac{5}{6} \times \frac{3}{10}$ **13.** $\frac{2}{5} \div \frac{4}{5}$ **14.** $\frac{9}{10} \times \frac{1}{3}$ **15.** $\frac{1}{4} \div \frac{7}{8}$

16. $\frac{3}{16} \times \frac{2}{5}$ **17.** $\frac{2}{5} \div 20$ **18.** $18 \times \frac{1}{3}$ **19.** $\frac{1}{10} \times 6$ **20.** $24 \div \frac{3}{8}$

21. $5\frac{1}{2} \times \frac{9}{16}$ **22.** $8\frac{1}{4} \div \frac{3}{10}$ **23.** $1\frac{7}{8} \times 2\frac{1}{3}$ **24.** $3\frac{3}{4} \div 6\frac{1}{2}$ **25.** $2\frac{1}{2} \div 1\frac{7}{8}$