MULTIPLYING AND DIVIDING FRACTIONS

MULTIPLYING FRACTIONS

Unlike when you add and subtract fractions, the denominators do not have to be the same. To multiply fractions, first multiply the numerators. Then multiply the denominators. Simplify your answer if necessary. That's it!

EXAMPLE: $\dfrac{3}{5} \times \dfrac{4}{7} = \dfrac{12}{35}$

Sometimes, when multiplying fractions, you might see that a numerator and a denominator will have common factors. You can simplify them before multiplying in the same way that we simplify fractions. Some teachers call this "**CROSS-REDUCING**" or "**CANCELING**." Whatever you call it, it's a shortcut!

EXAMPLE: $\dfrac{1}{\cancel{4}_{1}} \cdot \dfrac{\cancel{8}^{2}}{9} = \dfrac{2}{9}$ (The GCF of **8** and **4** is **4**.)

EXAMPLE: A recipe calls for $\frac{4}{5}$ cup of chocolate milk, but you want to cut the recipe in half. How much chocolate milk do you need?

$$\frac{\cancel{4}^{2}}{5} \cdot \frac{1}{\cancel{2}_{1}} = \frac{2}{5}$$

DIVIDING FRACTIONS

To divide fractions, follow these steps:

1. Flip the second fraction to make its **RECIPROCAL**.

2. Change the division sign to multiplication.

3. Multiply.

A **RECIPROCAL** of a number is another number that, when multiplied together, their product is **1**. In plain English—any number multiplied by its reciprocal equals **1**.

$$\frac{8}{1} \times \frac{1}{8} = 1$$

$$\frac{2}{3} \times \frac{3}{2} = 1$$

To find the reciprocal, flip the fraction.

EXAMPLE: $\frac{3}{5} \div \frac{8}{9} = \frac{3}{5} \cdot \frac{9}{8} = \frac{27}{40}$

Don't forget that when you are multiplying or dividing mixed numbers, you must convert them to improper fractions first!

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

$$\frac{7}{3} \div \frac{5}{4} = \frac{7}{3} \times \frac{4}{5} = \frac{28}{15} = 1\frac{13}{15}$$

CHECK YOUR KNOWLEDGE

1. $\dfrac{3}{4} \cdot \dfrac{1}{2}$

2. $\dfrac{7}{10} \cdot 1\dfrac{1}{3}$

3. $\dfrac{4}{5} \cdot \dfrac{1}{8}$

4. A machine pumps $4\dfrac{1}{2}$ gallons of water every hour. How many gallons of water does it pump after $2\dfrac{2}{3}$ hours?

5. Billy jogs $\dfrac{4}{5}$ kilometer every minute. How many kilometers does he jog after $6\dfrac{1}{8}$ minutes?

6. $\dfrac{5}{7} \div \dfrac{1}{2}$

7. $\dfrac{7}{8} \div \dfrac{2}{9}$

8. $9\dfrac{1}{2} \div 3\dfrac{1}{5}$

9. How many $\dfrac{3}{4}$-ounce spoonfuls of sugar are in a $5\dfrac{1}{2}$-ounce bowl?

10. How much chocolate will each person get if 3 people share $\dfrac{4}{5}$ pound of chocolate equally?

CHECK YOUR ANSWERS

1. $\frac{3}{8}$

2. $\frac{14}{15}$

3. $\frac{1}{10}$

4. 12 gallons

5. $4\frac{9}{10}$ kilometers

6. $1\frac{3}{7}$

7. $3\frac{15}{16}$

8. $2\frac{31}{32}$

9. $7\frac{1}{3}$ spoonfuls

10. $\frac{4}{15}$ pound