

Operations on Fractions, Distributive Property, and Evaluating an Expression

**To add or subtract two fractions, they must have a common denominator.

For Example: $\frac{1}{2} + \frac{1}{3}$

common denominator of 2 and 3 is 6
 $\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

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

$$\begin{array}{r} \frac{4 \cdot 3}{5 \cdot 3} = \frac{12}{15} \\ + \frac{2 \cdot 5}{3 \cdot 5} = \frac{10}{15} \end{array}$$

$$\boxed{\frac{22}{15}}$$

**To multiply two fractions, simply multiply the numerators, then multiply the denominators and simplify.

For Example: $\frac{2}{3} \times \frac{4}{7} = \frac{2 \cdot 4}{3 \cdot 7} = \frac{8}{21}$

$$\frac{6}{5} \times \frac{1}{4} = \frac{6 \cdot 1}{5 \cdot 4} = \frac{6}{20} = \boxed{\frac{3}{10}}$$

**To divide a fraction by another fraction, multiply by the reciprocal of the second fraction.

For Example: $\frac{9}{4} \div \frac{3}{5} = \frac{9}{4} \cdot \frac{5}{3} = \boxed{\frac{15}{4}}$

$$\frac{8}{9} \div \frac{4}{5} = \frac{8}{9} \cdot \frac{5}{4} = \boxed{\frac{10}{9}}$$

If you need to multiply mixed numbers, you need to change them to improper fractions FIRST. Then multiply them.

$$2\frac{1}{2} \times 4\frac{3}{5} = \left(2\frac{1}{2} \times 2\right) = \frac{5}{2} \times \frac{23}{5} = \frac{23}{2}$$

Distributive Property

When given an expression like



$5(x + 3)$, you need to distribute the 5 by multiplying it by **each term** inside the parentheses

$$5x + 15$$

Simplify.

$$8(a + 6) = 8a + 48$$

$$4(x + y - 3) = 4x + 4y - 12$$

Evaluating an Expression

When you evaluate an algebraic expression, you substitute in the given values for the variables into the given expression and simplify.

For Example:

Evaluate $2a - 3b$ For $a = 3$ and $b = -2$

$$\begin{aligned} 2(3) - 3(-2) \\ 6 - (-6) = 6 + 6 = 12 \end{aligned}$$

Evaluate:

$x^2 - 3y + 4$ For $x = -3$ and $y = 5$

$$(-3)^2 - 3(5) + 4$$

$$9 - 15 + 4$$

$$-6 + 4 = -2$$