Distributive property

The distributive property is a method you can use to simplify expressions, especially when there are variables. To distribute, multiply the factor outside of the parentheses by each term inside the parentheses.

Distributive Property:

$$a(b + c) = ab + ac \qquad\qquad (a + b)c = ac + bc$$

$$a(b - c) = ab - ac \qquad\qquad (a - b)c = ac - bc$$

Distributing removes the parentheses from the expression. When you're learning to distribute, it's useful to first write out the individual multiplications (the multiplications of the factor outside the parentheses by the individual terms inside the parentheses) and then simplify them in a separate step.

Example

Use the distributive property to expand the expression.

$$4(3 - x)$$

Multiply the factor outside the parentheses (the number 4) by each term inside the parentheses.

$$4(3) - 4(x)$$

$$12 - 4x$$

Let's try another example of the distributive property.

Example

Use the distributive property to expand the expression.

$$-\frac{1}{3}(3y + 15)$$

Multiply the factor outside the parentheses (the number $-1/3$) by each term inside the parentheses.

$$-\frac{1}{3}(3y) + \left(-\frac{1}{3}\right)(15)$$

$$-y - 5$$