

Recommendation 2 (continued)


Example 2.2. Modeling precise mathematical language, the distributive property

A teacher describes and illustrates the process for multiplying two binomials by using the distributive property. As a result of the teacher's modeling, students can understand the mathematical meaning behind using the distributive property as a solution strategy.

Teacher: Let's first notice the structure of this expression.

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


We have two binomials, and each binomial consists of the sum or difference of two quantities. We can use extensions of the distributive property of multiplication over addition to rewrite the expression. The first binomial, $2x + 5$, is the sum of $2x$ and 5 . We can distribute—from the right—the second binomial, $4x - 3$, over the first binomial:



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

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

We can then distribute each monomial, $2x$ and 5 , over the binomial:



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

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

Carrying out multiplication, we have

$$8x^2 - 6x + 20x - 15$$

or

$$8x^2 + 14x - 15.$$

Example 2.3. Imprecise vs. precise mathematical language

Imprecise language	Precise mathematical language
Take out the x .	Factor x from the expression. Divide both sides of the equation by x , with a caution about the possibility of dividing by 0.
Move the 5 over.	Subtract 5 from both sides of the equation.
Use the rainbow method. Use FOIL.	Use the distributive property.
Solve an expression.	Solve an equation. Rewrite an expression.
A is apples.	Let a represent the number of apples. Let a represent the cost of the apples in dollars. Let a represent the weight of the apples in pounds.
Plug in the 2.	Substitute 2 for x .
To simplify, flip it and multiply. To divide a fraction, invert and multiply.	To simplify, multiply both sides by the reciprocal. To divide fractions, multiply by the reciprocal.
Do the opposite to each side.	Use inverse operations. Add the opposite to each side.
The numbers cancel out.	The numbers add to zero. The numbers divide to one.
Plug it into the expression.	Evaluate the expression.