ALMS8

TAILORED LEARNING, PERSONALIZED PROGRESS

GRADE 8

SUPPLEMENTARY MODULE 7

Use Special Product Patterns To Multiply Binomials

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1 USE SPECIAL PRODUCT PATTERNS TO MULTIPLY BINOMIALS

WELCOME, LEARNERS!

If you're feeling a bit tangled up with special product patterns and multiplying binomials, don't worry—you're not alone. Learning these concepts can be like solving a puzzle, and sometimes it takes a little extra time to click. Here in the supplementary section, our goal is to help you untangle those knots and feel confident in mastering these skills. We'll revisit key concepts in different ways, offering additional examples, fun exercises, and tips tailored to your pace. Each step forward, no matter how small, is a leap closer to mastering this skill. You've got this!

Learning Objectives:

At the end of this module, students will be able to:

1. recall and differentiate between various special product patterns used in multiplying binomials;
2. proficiently recite the step-by-step processes involving the special product patterns in the multiplication of binomials; and
3. develop a positive attitude towards mastering special product patterns.

Three Special Cases of Multiplying Binomials and their Patterns

Let a be the first term in the expression and b be the second term.

1. **Square of a Sum** (Add times Add)$(a+b)^2 = a^2 + 2ab + b^2$

Example:

$$(2x+10)^2 = ?$$

Let a = 2x (first term) and b = 10 (second term). Substitute into $a^2 + 2ab + b^2$.

$$= (2x)^2 + 2(2x)(10) + (10)^2$$
$$(2x+10)^2 = 4x^2 + 40x + 100$$

2. **Square of a Difference** (Subtract Times Subtract)

$$(a-b)^2 = a^2 - 2ab + b^2$$

Example:

$$(3y-9)^2 = ?$$

Let a = 3y (first term) and b = 9 (second term). Substitute into $a^2 - 2ab + b^2$.

$$= (3y)^2 - 2(3y)(9) + (9)^2$$
$$(3y-9)^2 = 9y^2 - 54y + 81$$

3. **Product of the Sum and Difference** (Add Times Subtract)

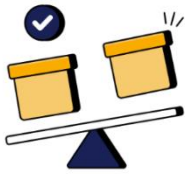
$$(a+b)(a-b) = a^2 - b^2$$

Example:

$$(2y+7)(2y-7) = ?$$

Let a = 2y (first term) and b = 7 (second term). Substitute into $a^2 - b^2$.

$$= (2y)^2 - (7)^2$$
$$(2y+7)(2y-7) = 4y^2 - 49$$



Comparing the Special Product Patterns

Binomial Squares	Product of Conjugates
• $(a+b)^2 = a^2 + 2ab + b^2$	• $(a+b)(a-b) = a^2 - b^2$
• $(a-b)^2 = a^2 - 2ab + b^2$	
• Squaring a binomial	• Multiplying conjugates
• Product is a trinomial	• Product is a binomial
• Inner and outer terms with FOIL are the same.	• Inner and outer terms with FOIL are opposites.
• Middle term is double the product of the terms.	• There is no middle term.