

The background is a solid green color with various mathematical symbols scattered across it. These symbols include plus signs (+), minus signs (-), multiplication signs (x), and squares, all in a lighter shade of green. Some symbols are larger and more prominent, while others are smaller and more subtle. The symbols are distributed in a way that suggests a mathematical or algebraic theme.

# Special Case on the Product of Binomial and Trinomial

# Let's exercise our mind.

Solve the following

$$\begin{aligned} 1. (4x + 5y)^3 &= (4x)^3 + 3(4x)^2(5y) + 3(4x)(5y)^2 + (5y)^3 \\ &= 64x^3 + 240x^2y + 300xy^2 + 125y^3 \end{aligned}$$

$$\begin{aligned} 2. (3x - 7y)^3 &= (3x)^3 - 3(3x)^2(7y) + 3(3x)(7y)^2 - (7y)^3 \\ &= 27x^3 - 189x^2y + 441xy^2 - 343y^3 \end{aligned}$$

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# SPECIAL CASE ON THE PRODUCT OF BINOMIAL AND TRINOMIAL

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$$(3x + 1)(9x^2 - 3x + 1) \quad (5p + 7)(25p^2 - 35p + 49)$$

$$(6a - b)(36a^2 + 6ab + b^2) \quad (7v - 2)(49v^2 + 14v + 4)$$

Multiply Using the Distributive Property of Multiplication

$$(x + y)(x^2 - xy + y^2)$$

$$(x + y)(x^2 - xy + y^2)$$

$$\begin{array}{r} x^3 - x^2y + xy \\ + \quad x^2y - xy^2 + y^3 \\ \hline \end{array}$$

$$\underline{(x + y)(x^2 - xy + y^2) = x^3 + y^3}$$

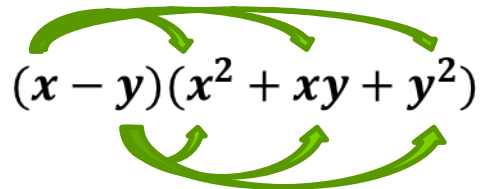
# SPECIAL CASE ON THE PRODUCT OF BINOMIAL AND TRINOMIAL

$$(3x + 1)(9x^2 - 3x + 1) \quad (5p + 7)(25p^2 - 35 + 49)$$

$$(6a - b)(36a + 6ab + b^2) \quad (7v - 2)(49v^2 + 14v + 4)$$

Multiply Using the Distributive Property of Multiplication

$$(x - y)(x^2 + xy + y^2)$$


$$(x - y)(x^2 + xy + y^2)$$

$$\begin{array}{r} x^3 + x^2y + xy \\ + \quad -x^2y - xy^2 - y^3 \\ \hline \end{array}$$

$$\underline{(x - y)(x^2 + xy + y^2) = x^3 - y^3}$$

# SPECIAL CASE ON THE PRODUCT OF BINOMIAL AND TRINOMIAL

## Examples:

$$(x + y)(x^2 - xy + y^2) = x^3 + y^3$$

$$(x - y)(x^2 + xy + y^2) = x^3 - y^3$$

$$\begin{array}{l} \mathbf{1. (3x + 1)(9x^2 - 3x + 1) = (3x)^3 + (1)^3} \\ \quad \quad \quad \mathbf{x \quad \quad y} \qquad \qquad \qquad \mathbf{= 27x^3 + 1} \quad \checkmark \end{array}$$

$$\begin{array}{r}
 (3x+1)(9x^2-3x+1) \quad \begin{array}{l} \text{27x^3 - 9x^2 + 3x} \\ \text{9x^2 - 3x + 1} \end{array} \\
 \hline
 (3x+1)(9x^2-3x+1) = 27x^3 + 1 \quad \checkmark
 \end{array}$$

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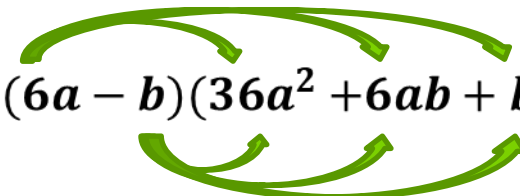
Examples:

$$(x + y)(x^2 - xy + y^2) = x^3 + y^3$$

$$(x - y)(x^2 + xy + y^2) = x^3 - y^3$$

$$2. \underset{x}{(6a - b)} \underset{y}{(36a^2 + 6ab + b^2)} = (6a)^3 - (b)^3 \quad (6a)^3 + (-b)^3$$

$$= 216a^3 - b^3 \quad \checkmark$$



$$\begin{array}{r}
 (6a - b)(36a^2 + 6ab + b^2) \quad 216a^3 + 36a^2b + 6ab \\
 \quad \quad \quad + \quad \quad \quad - 36a^2b - 6ab^2 - b^3 \\
 \hline
 \underline{(6a - b)(36a^2 + 6ab + b^2) = 216a^3 - b^3} \quad \checkmark
 \end{array}$$

# SPECIAL CASE ON THE PRODUCT OF BINOMIAL AND TRINOMIAL

Examples:

$$(x + y)(x^2 - xy + y^2) = x^3 + y^3$$

$$(x - y)(x^2 + xy + y^2) = x^3 - y^3$$

$$\begin{aligned} 3. (5p + 7)(25p^2 - 35p + 49) &= (5p)^3 + (7)^3 \\ &= 125p^3 + 343 \end{aligned}$$

$$\begin{aligned} 4. (7v - 2)(49v^2 + 14v + 4) &= (7v)^3 - (2)^3 \\ &= 343v^3 - 8 \end{aligned}$$

$$\begin{aligned} 5. (10c - 3d)(100c^2 + 30cd + 9d^2) &= (10c)^3 - (3d)^3 \\ &= 1000c^3 - 27d^3 \end{aligned}$$



## Remember:

When the sum of two terms is multiplied by the sum of their squares minus the product of these terms, the result is the sum of their cubes.

$$(x + y)(x^2 - xy + y^2) = x^3 + y^3$$

When the difference of two terms is multiplied by the sum of their squares plus the product of these terms, the result is the difference of their cubes.

$$(x - y)(x^2 + xy + y^2) = x^3 - y^3$$

## Activity #5

Find the product of the following: (Show your solution and use the formula.)

A. Cube of Binomials (5pts)

1.  $(3x - 4y)^3$

B. Special case on the product of binomial and trinomial (15pts)

1.  $(m - 1)(m^2 + m + 1)$

4.  $(6a - 8)(36a^2 + 48a + 64)$

2.  $(3n + 7)(9n^2 - 21n + 49)$

5.  $(9f - 4g)(81f^2 + 46fg + 16g^2)$

3.  $(2c + 5)(4c^2 - 10c + 25)$

The background is a solid green color. It is decorated with a repeating pattern of light green geometric shapes: squares, circles, and crosses. These shapes are arranged in a way that they appear to be floating or scattered across the background. The text "THANK YOU!!!" is centered in the middle of the image in a white, bold, sans-serif font. The exclamation marks are slightly larger than the letters.

THANK YOU!!!