**How do we multiply several polynomials together?**

Multiply **\_\_\_\_\_\_\_\_\_** polynomials together at a time. Remember that the order does **\_\_\_\_\_\_\_\_\_\_** matter…so group them however you’d like!

**Example: simplify completely**

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**Example: simplify completely**

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**Example: simplify completely**

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**Is there a “faster” way to multiply any of these????**

Yes! We can use **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to multiply binomials a bit faster.

The Binomial Expansion Theorem is

Used to expand binomials of the form \_\_\_\_\_\_\_.

**All of the numbers, variables, & exponents follow a pattern in the theorem!**

\*Number of terms in your answer = \_\_\_\_\_\_\_\_\_\_

\*Coefficients follow Pascal's Triangle of Coefficients (\_\_\_\_\_’s along the diagonals & \_\_\_\_\_\_\_\_ middle numbers)

\*Each expansion will \_\_\_\_\_\_\_\_\_\_ with "a" and \_\_\_\_\_\_\_\_\_\_ with "b" & In \_\_\_\_\_\_\_\_\_\_\_\_\_\_ them will be "sets" of "ab's"

\*Exponents will decrease for "\_\_\_\_\_\_" from left to right and decrease for "\_\_\_\_\_\_\_" from right to left

\*Exponents on each terms \_\_\_\_\_\_\_ up to the n value

**How to set up the binomial expansion theorem:**

**Step 1:** Fill in the Coefficients of each box.

**Step 2:** Fill in the first box with an “a” and the last box with a “b” on each row

**Step 3:** Fill in any of the middle boxes with “ab” on each row

**Step 4:** using the exponent, count down from left to right starting with “a”

**Step 5:** Using the exponent, count down from right to left starting with “B”

*\*Repeat step 4 & Step 5 for every row*

**Step 6:** Put a + in between each term

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| Binomial | Expansion | | | | | | | | | | |
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**Example: Find the 3rd term of the polynomial using The Binomial Expansion Theorem.**

**Example: Find the 2nd term of the polynomial using The Binomial Expansion Theorem.**

**Example: Expand completely using the Binomial Expansion Theorem.**