

Investigation of Binomial Expansion

This investigation serves to help us discover patterns that will allow us to more efficiently expand binomials. The patterns you notice will be very significant!

Step 1

On notebook paper, use the distributive property to progressively expand each binomial. Neatly, write each result (in standard form) on this outline. Wherever there is a coefficient of "1", write it in, so it is visible.

$$(a + b)^0 =$$

1

$$(a + b)^1 =$$

1a + 1b

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

1a² + 2ab + 1b²

$$(a + b)^3 =$$

1a³ + 3a²b + 3ab² + 1b³

$$(a + b)^4 =$$

1a⁴ + 4a³b + 6a²b² + 4ab³ + 1b⁴

$$(a + b)^5 =$$

1a⁵ + 5a⁴b + 10a³b² + 10a²b³ + 5ab⁴ + 1b⁵

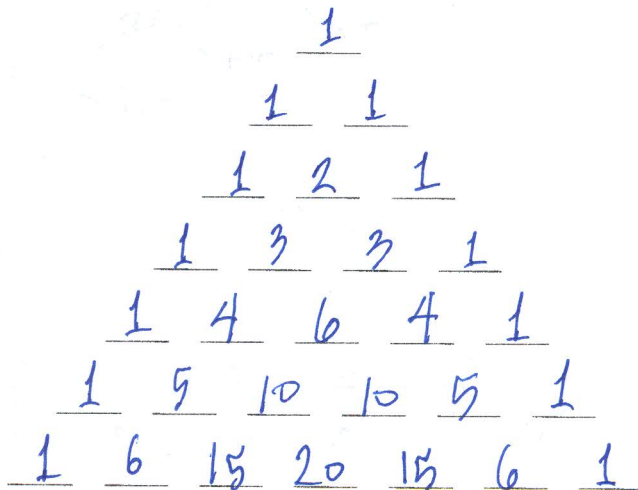
This pattern continues ...

Step 2:

Use a highlighter to highlight all of the coefficients, including coefficients of "1".

Step 3:

Use the coefficients from each expanded binomial to fill in the blanks of the pyramid below.



You should notice some significant patterns!

This pyramid is called "Pascal's Triangle."