**Binomial Theorem**

Pascal’s Triangle Binomial Expansion

 (a + b)0 =

 (a + b)1 =

 (a + b)2 =

 (a + b)3 =

 (a + b)4 =

What do you notice about the expansions of (a + b)n?

* The simplified expansions have \_\_\_\_\_\_\_ terms.
* The exponents of ‘a’ start at a value ‘n’ and \_\_\_\_\_\_\_\_\_ by one for each successive term until it is reduced to 0.
* The exponents of ‘b’ start at a value 0 and \_\_\_\_\_\_\_\_\_ by one for each successive term until it reaches ‘n’.
* The coefficients in the simplified expansion are identical to the elements of \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ in row n; the first and last coefficient is always 1.

Additionally,

$$\begin{matrix}coefficient of \\the next term\end{matrix}=\frac{current coefficient×current exponent of 'a' }{current term number}$$

**Examples**

Use Pascal’s triangle to expand the following binomials:

a) (x + 2y)4

b) (-3x + 2y)3

c) $\left(\frac{1}{2}– 3y\right)^{3}$

Homework: Expand the following.

a) $(x + 3y)^{3}$ b) $(1 – x)^{4}$ c) $(x - 5y)^{3}$ d) $\left(x-\frac{1}{2}\right)^{5}$

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