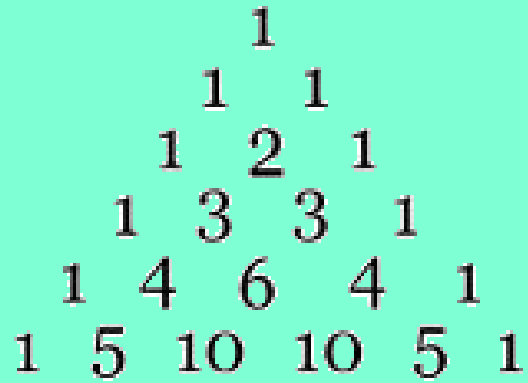


5-7 Binomial Theorem and Pascal's Triangle



Can you figure out how to obtain the next row of numbers?

Definitions

Binomial

a polynomial with 2 terms

examples: $(x + 2)$ $(x + y)$ $(3x + y)$

Coefficient

a number that is in front of a variable

examples: $\underline{5}x$ $\underline{7}x^2$ $\underline{-2}y$

The goal is to expand expression in the form
 $(x + y)^n$ using a "shortcut."

... Pascal's Triangle helps us with that.

Pascal's Triangle gives us the coefficients used to expand.

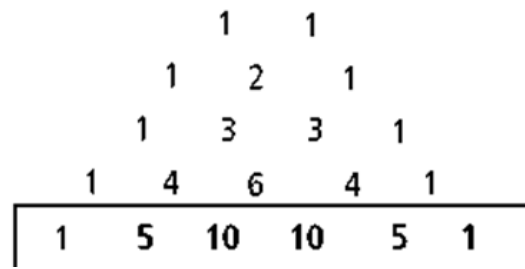
(Remember anything to the zero power is 1.)

$$\begin{array}{l} \curvearrowright (x + y)^0 = \quad \quad \quad 1 \\ (x + y)^1 = \quad \quad 1 \quad 1 \\ (x + y)^2 = \quad 1 \quad 2 \quad 1 \\ (x + y)^3 = 1 \quad 3 \quad 3 \quad 1 \end{array}$$

For example...

$$(x + y)^5 =$$

Pascal's Triangle



Count down for x.

$$1x^5y^0 + 5x^4y^1 + 10x^3y^2 + 10x^2y^3 + 5x^1y^4 + 1x^0y^5$$

Count up for y.

What do you notice about the sum of the exponents for each term?

Match each term with the proper binomial.



ORDER OF OPERATIONS!!!!!!

Expand.

$$(a^2 + b)^3$$



Expand.

$$(x - 2)^3$$

Questions?
Click Here



Expand.

$$(2x + y)^4$$

Questions?
Click Here



Compare the the factored and expanded forms of each expression, paying particular attention to the number of terms in the expanded form and the original exponent. What do you notice?



Complete the statement: When $(x + y)^n$ is given, the expanded form will have _____ terms.