Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
PASCAL'S TRIANGLE	Pascal's triangle was a pattern of numbers that was discovered in the 13th century. Each number in Pascal's triangle is the sum of the two numbers diagonally above it. All outside numbers are 1. Complete rows 4 and 5 of Pascal's triangle below: **Row 0 →** 1 **Row 1 →** 1 1 **Row 2 →** 1 2 1 **Row 3 →** 1 3 3 1 **Row 4 →** ☐ ☐ ☐ ☐ ☐ **Row 5 →** ☐ ☐ ☐ ☐ ☐ ☐
Expanding Binomials	Expand the binomial $(a+b)^3$: What do you notice about the coefficients?
THE BINOMIAL THEOREM	If n is a natural number, then $(a+b)^n =$ $_nC_0 \cdot a^n b^0 + {_nC_1} \cdot a^{n-1} b^1 + {_nC_2} \cdot a^{n-2} b^2 + \ldots + {_nC_n} \cdot a^0 b^n = \boxed{\sum_{k=0}^{n} {_nC_k} \cdot a^{n-k} b^k}$
Examples	**Directions:** Use the binomial theorem to expand each binomial. **1.** $(a+b)^5$ **2.** $(x+y)^7$

	3. $(c+d)^{10}$
Coefficients Other than 1	**4.** $(x-3)^{6}$
	5. $(2m+n)^{7}$
	6. $(k+2)^{8}$
	7. $(3p-2q)^{5}$
Observations	**In the binomial expansion of $(a+b)^n$:** • The total number of terms is always ________. • The exponent of a in the first term is ________. • The exponent of b in the last term is ________. • The exponent of a ____________________ from left to right. • The exponent of b ____________________ from left to right. • The sum of the exponents in each term is ________. • The coefficients are ____________________ and follow the ________ row of ____________________.