

Binomial Expansion
expanding a binomial raised to the n^{th} degree

$$(x + 3)^2$$

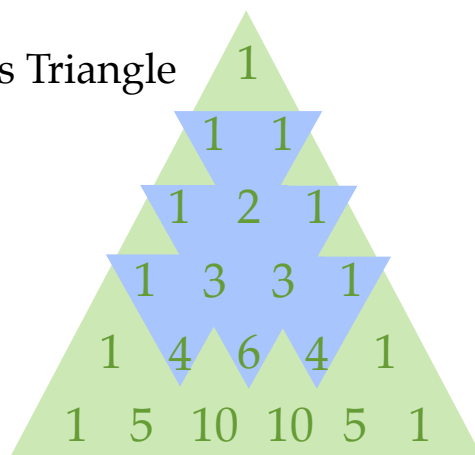
$$(x + 3)(x + 3)$$

$$(x + 3)^5$$

$$(x + 3)(x + 3)(x + 3)(x + 3)(x + 3)$$

Binomial Expansion
with Pascal's Triangle

Pascal's Triangle



Binomial Expansion with Pascal's Triangle

Binomial Expansion	Pascal's Triangle
$(a + b)^0 = 1$	1
$(a + b)^1 = a + b$	1 1
$(a + b)^2 = a^2 + 2ab + b^2$	1 2 1
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$	1 3 3 1
$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$	1 4 6 4 1
$(a + b)^5 = a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$	1 5 10 10 5 1

$$(a + b)^3$$

$$\begin{array}{rcl}
 n = 0 & & 1 \\
 n = 1 & & 1 \quad 1 \\
 n = 2 & & 1 \quad 2 \quad 1 \\
 n = 3 & & 1 \quad 3 \quad 3 \quad 1 \\
 n = 4 & & 1 \quad 4 \quad 6 \quad 4 \quad 1 \\
 n = 5 & & 1 \quad 5 \quad 10 \quad 10 \quad 5 \quad 1
 \end{array}$$

$$(a + b)^4$$

$n = 0$				1			
$n = 1$			1	1			
$n = 2$		1	2	1			
$n = 3$	1	3	3	1			
$n = 4$	1	4	6	4	1		
$n = 5$	1	5	10	10	5	1	

$$(x + 2)^4$$

$n = 0$				1			
$n = 1$			1	1			
$n = 2$		1	2	1			
$n = 3$	1	3	3	1			
$n = 4$	1	4	6	4	1		
$n = 5$	1	5	10	10	5	1	

$$(x - 4)^3$$

$n = 0$				1			
$n = 1$				1	1		
$n = 2$				1	2	1	
$n = 3$				1	3	3	1
$n = 4$			1	4	6	4	1
$n = 5$	1	5	10	10	5	1	

$$(x + 3)^5$$

$n = 0$					1		
$n = 1$					1	1	
$n = 2$					1	2	1
$n = 3$				1	3	3	1
$n = 4$			1	4	6	4	1
$n = 5$	1	5	10	10	5	1	