

Precalculus

10-06 Binomial Theorem

$$\begin{array}{rcccccc}
 (x+y)^0 & & & & & & 1 \\
 (x+y)^1 & & & & 1x & & 1y \\
 (x+y)^2 & & & 1x^2 & 2xy & & 1y^2 \\
 (x+y)^3 & & 1x^3 & 3x^2y & 3xy^2 & & 1y^3 \\
 (x+y)^4 & 1x^4 & 4x^3y & 6x^2y^2 & 4xy^3 & & 1y^4
 \end{array}$$

Properties

- _____ terms
- Powers of x count _____, y 's count _____
- Sum of exponents of each term = _____
- Coefficients are _____

Binomial theorem

$$(a+b)^n = \sum_{r=0}^n {}_n C_r a^{n-r} b^r$$

- where ${}_n C_r = \frac{n!}{(n-r)!r!}$

Evaluate

$${}_9 C_2 \qquad \qquad \qquad \binom{11}{4}$$

$$\binom{8}{8} \qquad \qquad \qquad \binom{4}{2}$$

Expand $(x+2)^4$

Expand $(3 - x^2)^5$

Find the coefficient of the term a^4b^7 in $(2a - 3b)^{11}$