If I Had a set: X = {m,n,o,p...} whose number of elements were denoted as S, and I defined the following:

Let $X_{S}^{YYY...}$ Denote, if there are a Z count of Y's, the summation of all the combinations of S elements

Taken Z at a time, where each element is raised to the power of Y.
ie...

If X = {a,b,c,d}, so S = 4, then:

$X_{4}^{22} = \{a^2b^2 + a^2c^2 + a^2d^2 + b^2c^2 + b^2d^2 + c^2d^2\}$

So its easy to see that the number of terms in the summation is equal to:

#terms = [S!]/[(S-Z)!]*[Z!]

ie...

4!/2!2! = 6, which is the number of terms in that sum.

So, lets say I had the Following:

$X_{4}^{2,1} = \{a^2b + a^2c + a^2d + b^2a + b^2c + b^2d + ...\}$

The process by which I would calculate the #Terms seems to be the following:

(4!/[4-1]![1!])*([4-1]!/[(4-1)-1]![1!]) ==> [4!/2!] = 12

Or, More Generally:

If we had: $X_{S}^{Y1,Y1...Y2,Y2...Y3,Y3...Y...}$

Where Z1 = #Y1's, Z2 = #Y2's, ...
Then the count of the terms in the final summation would be:

[S!/(S-Z1)!(Z1!)]*[(S-Z1)!/(S-Z1-Z2)!(Z2)!]*[(S-Z1-Z2)!/(S-Z1-Z2-Z3)!(Z3)!]...

Or:

[S!/{(S-Z1-Z2-Z3...!)*(Z1!)*(Z2!)*(Z3!)...}]

For example, if we had X = {a,b,c,d,e,f}, and we wanted:

$X_{6}^{2,1,1}$

My Equation says there would be, since there is one 2, and Two ones,:

[6!]/{[6-1-2]!*[1!]*[2!]} = 6*5*4*3*2*1/3*2*1*1*2*1 = 6*5*4/2 = 60

Which represents the number of terms in:

(
a^2*{bc + bd + be + bf + cd + ce + cf + de + df + ef} +
b^2{ac + ad + ae + af + cd + ce + cf + de + df + ef} + ...
)

Which as we see is indeed 6*10 or 60.