

Risp 19: Extending the Binomial Theorem

Pick an odd number greater than 1, and call it n .

Take the numbers 1 , -1 , and n ,
and place them into the square below in some order.

No repeats!

$$\left(\square + \square x \right)^{\frac{1}{\square}}$$

How many orders are there?

Write down an expression for each order.

Find the first two terms
of the expansion of each expression.

That is, find the constant term and the term in x .

Assume x is small enough to ignore terms in x^2 and higher.
When will all your expansions be valid at the same time?

Now add your expansions together to give, let's say, $A + Bx$.

Work out $\frac{A}{B} + n$. What do you get?

Will this always work? Can you prove it?