

Number of terms: and so on...

$$(a + b)^{-1'5}: +x + x + x/2$$

$$(a + b)^{-1}: +x + x$$

$$(a + b)^{-0'5}: +x + x/2$$

$$(a + b)^0: x$$

$$(a + b)^{0'5}: x + x/2$$

$$(a + b)^1: x + x$$

$$(a + b)^{1'5}: x + x + x/2$$

$$(a + b)^2: x + x + x$$

$$(a + b)^{2'5}: x + x + x + x/2$$

$$(a + b)^3: x + x + x + x$$

And so on...

Coefficients:

...

$$(a + b)^{-2} \rightarrow 0'25$$

$$(a + b)^{-1'5} \rightarrow 0'375$$

$$(a + b)^{-1} \rightarrow 0'5$$

$$(a + b)^{-0'5} \rightarrow 0'75$$

$$(a + b)^0 \rightarrow 1$$

$$(a + b)^{0'5} \rightarrow 1'5$$

$$(a + b)^1 \rightarrow 2$$

$$(a + b)^{1'5} \rightarrow 3$$

$$(a + b)^2 \rightarrow 4$$

$$(a + b)^{2,5} \rightarrow 6$$

$$(a + b)^3 \rightarrow 8$$

$$(a + b)^{3,5} \rightarrow 11$$

...

Σ exponents reason

$$\begin{array}{rcl}
 & \rightarrow -6 & \left. \vphantom{\begin{array}{l} (a+b)^{-2,5} \\ (a+b)^{-2} \\ (a+b)^{-1,5} \\ (a+b)^{-1} \end{array}} \right\} \\
 (a+b)^{-2,5} & \rightarrow -4 & \left. \vphantom{\begin{array}{l} (a+b)^{-2,5} \\ (a+b)^{-2} \end{array}} \right\} -2 \\
 (a+b)^{-2} & \rightarrow -2 & \left. \vphantom{\begin{array}{l} (a+b)^{-1,5} \\ (a+b)^{-1} \end{array}} \right\} \\
 (a+b)^{-1,5} & \rightarrow -1 & \left. \vphantom{\begin{array}{l} (a+b)^{-1,5} \\ (a+b)^{-1} \end{array}} \right\} -1 \\
 (a+b)^{-1} & \rightarrow 0 & \left. \vphantom{\begin{array}{l} (a+b)^{-0,5} \\ (a+b)^0 \end{array}} \right\} \\
 (a+b)^{-0,5} & \rightarrow 0 & \left. \vphantom{\begin{array}{l} (a+b)^{-0,5} \\ (a+b)^0 \end{array}} \right\} 0 \\
 (a+b)^0 & \rightarrow 0 & \left. \vphantom{\begin{array}{l} (a+b)^{0,5} \\ (a+b)^1 \end{array}} \right\} \\
 (a+b)^{0,5} & \rightarrow 1 & \left. \vphantom{\begin{array}{l} (a+b)^{0,5} \\ (a+b)^1 \end{array}} \right\} 1 \\
 (a+b)^1 & \rightarrow 2 & \left. \vphantom{\begin{array}{l} (a+b)^{1,5} \\ (a+b)^2 \end{array}} \right\} \\
 (a+b)^{1,5} & \rightarrow 4 & \left. \vphantom{\begin{array}{l} (a+b)^{1,5} \\ (a+b)^2 \end{array}} \right\} 2 \\
 (a+b)^2 & \rightarrow 6 & \left. \vphantom{\begin{array}{l} (a+b)^{2,5} \\ (a+b)^3 \end{array}} \right\} \\
 (a+b)^{2,5} & \rightarrow 9 & \left. \vphantom{\begin{array}{l} (a+b)^{2,5} \\ (a+b)^3 \end{array}} \right\} 3 \\
 (a+b)^3 & \rightarrow 12 & \left. \vphantom{\begin{array}{l} (a+b)^{3,5} \end{array}} \right\} \\
 (a+b)^{3,5} & \rightarrow 16 & \left. \vphantom{\begin{array}{l} (a+b)^{3,5} \end{array}} \right\} 4
 \end{array}$$

...

$$(a + b)^{-0.5}: [0.375 \cdot a^0 + 0.375 \cdot b^0] = 0.75.$$

$$[0.375 \cdot a^{+1} + 0.375 \cdot b^{-1}] = ?$$

$$\sum \text{coefficient}: 0.75 \rightarrow 0.75/2 = 0.375,$$

$$\sum \text{exponent} = 0 \rightarrow (0 \ 0), (+1 \ -1), (+2 \ -2) \dots$$

$$\text{or: } (a + b)^{-1}: [(1/4) \cdot a^0 + \frac{1}{4} \cdot b^0] = 1/2$$

$$[(1/4) \cdot a^{+1} + (\frac{1}{4}) \cdot b^{-1}] = [0.25 \cdot a^{-1} + 0.25 \cdot b^{+1}] = ?$$

$$\text{where } \sum \text{coefficient}: 0.5 = \frac{1}{2} \rightarrow 0.5/2 = 0.25$$

$$\text{while } \sum \text{exponent} = 0 \rightarrow (0 \ 0), (+1 \ -1), (+2 \ -2) \dots$$

$$(a + b)^{0.5}: [0.75 \cdot a^{0.5} + 0.75 \cdot b^{0.5}]$$

$$\text{Where: } \sum \text{coefficient} = 1.5 = 3/2 = 0.75$$

$$\sum \text{exponent} = 1$$

The idea is that in expansions of number of terms ≥ 2.5 , the central terms show a larger coefficient than the external ones. There is another rule: all terms have the same value $\sum \text{exp.}$ (the rule is to mix "a" or "b" or "a" and "b").

The terms in n° have nothing to do with the values of the coefficients

And conclude that each binomial fits the number of terms already calculated previously.

I also do another expansion: $(a + b)^{1.5}$ taking into account the number of terms ($x + x + x/2$: "2.5 terms").

Another example: $(a + b)^{-1'5}$

Also n° of terms = "-2'5" →

Except from $(a + b)^2$

- 1	- 1	- 0'5
1	2	1
x 1	x 2	x 0'5
-0'7	-1'4	- 0'35

-0'7-1'4-0'35 ~ -2'5 terms

Σ Coeficient: 0'375 →

0'375 x 0'7	0'375 x 1'4	0'375 x 0'35
↓	↓	↓
21/80	21/40	21/160

Σ exp:-1 : -1 → 2'5

x → 0'7 , y → 1'4 , z → 0'35

then: x=-7/25 , y=-14/25 , z=-7/50

$$(a + b)^{-1'5} : \left(\frac{21}{80}\right) \cdot a^{-7/25} + \left(\frac{21}{40}\right) a^{-14/50} b^{-14/50} + \left(\frac{21}{160}\right) b^{-7/50}$$

Now I will try this: $(a + b)^{0'2}$:

$$\sum exp.: 0'4 \quad \sum coeff.: 1'2 \quad n^{\circ} \text{ of terms: } 1'2$$

Because $(a + b)^0 = 1 \rightarrow 1 \text{ term}$

$$(a + b)^{0'1} = 0'1 \rightarrow 1'1 \text{ term}$$

$$(a + b)^{0'2} = 0'1 \rightarrow 1'2 \text{ term}$$

...

$$(a + b)^{0'5} = 0'1 \rightarrow 1'5 \text{ term}$$

and: $\sum coeff.: 1'2$

$$(a + b)^0 = 1 \rightarrow 1$$

$$(a + b)^{0'1} \rightarrow 1'1$$

$$(a + b)^{0'2} \rightarrow 1'2$$

...

$$(a + b)^{0'5} = 1 \rightarrow 1'5$$

and: $\sum exp.: 0'4$

$$(a + b)^0 \rightarrow 0$$

$$(a + b)^{0'1} \rightarrow 0'2$$

$$(a + b)^{0'2} \rightarrow 0'4$$

$$(a + b)^{0'5} \rightarrow 1$$

...

so: $(a + b)^{0'2}$

evaluate this option: 1'2 terms: 1 1 x 0'2

$\sum coeff. : 1'2$ 1 0'2

With the exponents they should be the same: $\sum exp. : 0'4$

if $0'4 \rightarrow 1'2$

"x" $\leftarrow 1$ "x" = $1/3$

"y" $\leftarrow 0'2$ "y" = $1/15$

We have almost found the solution!!

$$(a + b)^{0'2} = 1. a^{1/3}. b^0 + 0'2. (a^0. b^{1/15})$$

All of these rules follow the same pattern: by definition, the third term is smaller, so the coefficients must also be smaller (?).

I dare to write this too: $(a + b)^{0'1}$ number of terms: 1'1

$\sum coeff. : 1'1$

$\sum exp. : 0'2$

2 terms: 1 1 x 0'1

$\sum coeff. : 1'1$ 1 0'1

And, referred to $\sum exp. : 0'2$ $0'2 \rightarrow 1'1$

"x" $\leftarrow 1$ "x" = $2/11$

"y" $\leftarrow 0'1$ "y" = $1/55$

$$(a + b)^{0'1} = 1. a^{2/11}. b^0 + 0'1. a^0. b^{1/55}$$

Can it be considered a method or is it simply "madness"?

I have taken into account that the fractional terms ($0'1$, $0'2$...) show a magnitude proportional to the percentage they represent.