COMMENT № 2

Two the way work out a problem of P.Fermat:

1. **Deductive (intuitive) way**
2. **Inductive way**

1. Deductive way

Let $x^8 + y^8 = z^8$ **equation of P. Fermat**

A priori it is known:

$$x = 3.967133355...$$

$$y = 4.262962429...$$

$$z = 4,507533969...$$

Issue:
How did I do it ?
Answer:
Enigma

3. Inductive way

Let $x^n = A$, $y^n = B$, $z = C$ **whole or rational numbers.**

Then:

$$x = \sqrt[n]{A}$$

$$y = \sqrt[n]{B}$$

$$z = \sqrt[n]{c}$$

Roots for equation of P.Fermat:

$$x^n + y^n = z^n$$

If

$$A + B = C$$

B A S I S
(from Internet)

I chose to begin with the notes out of which I constructed the central definition below. The equation which defines ‘distributivity’ is:

a(b+c) = ab + ac

This has, of course, a `reversed' form, (b+c)a = ba+ca: I chose to name the displayed form `left' distributive and this latter form `right' distributive. When cast in the general terms of binary operators, naming multiplication f and addition g, we have, for any legitimate a, b and c:

f(a, g(b,c)) = g(f(a,b), f(a,c))

Thus, if we take (A×B|f:C) and (D×E|g:F) as temporary namings for the domains and ranges of our binary operators, we obtain

- **a is in A;**
- **g(b,c) (in F), b and c are in B;**
- **f(a,b) (in C) and b are in D; and**
- **f(a,c) (in C) and c are in E.**

so we need F to be a subset of B and C to be a subset of D and of E. I chose to take C=D=E=F=B for this left-distributive case, replacing B with A for right-distributive.

Distributivity

A binary operator, (A×B|f:B), left-distributes over a uniform binary operator, g, on B precisely if, for every a in A and b, c in B: f(a,g(b,c)) = g(f(a,b),f(a,c)). We say (B×A|f:B) right-distributes over (B×B|g:B) precisely if, for every a in A and b, c in B: f(g(b,c),a) = g(f(b,a),f(c,a)). One binary operator is said to distribute over another precisely if the former both left-distributes and right-distributes over the latter - in which case both are necessarily uniform and the two are parallel (that is, they act on the same space).

In particular, any Abelian binary operator which left- or right-distributes over some binary operator inevitably distributes over the latter. When B and A are distinct, (A×B|f:B) can only distribute from the left over anything, and that must be over some (B×B|:B), so there is no ambiguity in refering to such an f as distributing over some g, implicitly uniform on B. It should also be noted that if f does left-distribute over some g, then its transpose, (B×A| (b,a)->f(a,b) :B), right-distributes over g.

Further reading

An (A×B|:B) may left-distribute over a (B×B|:B): compare and contrast with an (A×A|:|) left-associating over an (A×B|:B). The combination of these forms the cornerstone of the notion of linearity, which underlies such fundamental tools as scalars and vectors.

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