Algebra zero

Abstract:

In ordinary arithmetic, the expression 0/0 does not make sense.

It is an indeterminate form, for there is no such thing as a number that multiplied by 0, gives a number $a(a \neq 0)$. So, the division

Of 0/0 is indefinite (undetermined) in mathematics.

I will show with three examples, that this theory is completely wrong.

I will show from the following, three examples which are my discoveries,

That ,this theory is completely wrong.

1) System of three equations.

2) Resolution of the quadratic equation with a new formula.

3) Pseudo differential calculus. Mathematical tool that I discovered

See http://viXra.org/abs/2409.0003

With this discovery, I give the definition of absolute zero.

I hope that these discoveries, will open up new horizons for scientific research in general and for mathematics in particular.

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Algebra zero

Definition(1) of absolute zero:

Fundamental remark: In classical algebra, if we have a Operation $\frac{a \times b}{c}$

Start with $a \times b$ then divide by c; or start with division a / c then multiply by b it is allowed.

But when it comes to zero, the order is important we start with the division.

Example : $\frac{c \times 0_a}{0_b} = c \times \frac{0_a}{0_b} = c \times \frac{a}{b}$

Absolute zero .Definition (2):

In classical mathematics, a real number multiplied by zero is equal to zero.

The pseudo differential calculus that I discovered, claims that this is completely wrong. So: $a \times 0 = 0_a$; $b \times 0 = 0_b$

Number 0 is absolute zero. But once multiplies by a number $a(a : real, or, complex)$ it no longer becomes absolute.

Example1- Or the following system of equations $x, y, \alpha, \beta, \theta$ **reels.**

$$2x + (\beta - 1)y - 4 = 0..........(1)$$
$$(\beta + 1)x - 2y - \alpha = 0..........(2)$$
$$-x + (2 + \theta)y - \alpha = 0..........(3)$$

the system solutions are

$$x = 3, y = 1, \alpha = -2, \beta = -1, \theta = -1$$

Of the system of equations 2 and 3

$$\begin{cases} (\beta + 1)x - 2y - \alpha = 0..........(2) \\ -x + (2 + \theta)y - \alpha = 0..........(3) \end{cases}$$

$y=\frac{\alpha\beta+2\alpha}{(\beta+1)(\theta+2)-2}$ =1 , we calculate the value of x in equation (3) we find

$x=\frac{(2+\theta)(\alpha\beta+2\alpha)}{(\beta+1)(\theta+2)-2}=3$, if we calculate the value of x in equation (2)

$x=\frac{2y+\alpha}{\beta+1}=\frac{0}{0}$, indeterminate form, but if we replace y by its expression

$$x=\frac{4\alpha(\beta+1)}{(\beta+1)\left[(\beta+1)(\theta+2)-2\right]}+\frac{\alpha\theta(\beta+1)}{(\beta+1)\left[(\beta+1)(\theta+2)-2\right]}=$$

$$x=\frac{4\alpha\times 0}{0\left[(\beta+1)(\theta+2)-2\right]}+\frac{\alpha\theta\times 0}{0\left[(\beta+1)(\theta+2)-2\right]}=\frac{0}{0}\times\frac{4(-2)}{\left[0(-1+2)-2\right]}+\frac{0}{0}\times\frac{-1(-2)}{\left[0(-1+2)-2\right]}=$$

$$x==\frac{0}{0}\times\frac{-8}{-2}+\frac{0}{0}\times\frac{2}{-2}=\frac{0}{0}(4-1)=\frac{0}{0}\times 3=3$$

So $\frac{0}{0}=1$.

Let’s take the system (2) and (1)

$$\begin{cases} 2x+(\beta-1)y-4=0..........(1) \\ (\beta+1)x-2y-\alpha=0..........(2) \end{cases}$$

$y=\frac{4(\beta+1)-2\alpha}{\beta^2+3}=1$, From (1) : $x=\frac{-(\beta-1)\left[4(\beta+1)-2\alpha\right]}{2(\beta^2+3)}+\frac{4}{2}$

$$x=1+2=3$$

From equation (2) : $x=\frac{2y-\alpha}{\beta+1}=\frac{0}{0}$ indeterminate form,

But if we replace y by its expression

$$x=\frac{8(\beta+1)}{(\beta+1)(\beta^2+3)}+\frac{\alpha(\beta^2+3)-4\alpha}{(\beta+1)(\beta^2+3)}=\frac{0}{0}\times\frac{8}{4}+\frac{0}{0}=\frac{0}{0}(2+1)=3$$

So, $\frac{0}{0}=1$.

<u>Example 2:</u> formula for the quadratic equation that I discovered

$ax^2+bx+c=0$; $\Delta=b^2-4ac$;

$$x=\frac{\pm4(c+m)\sqrt{\Delta}-2(b\pm\sqrt{\Delta})m}{4a(c+m)-(b\pm\sqrt{\Delta})^2}$$, m being a free variable

Solve the equation: $2x^2+3x-2=0$

$$x_1=\frac{-4(c+m)\sqrt{\Delta}-2(b-\sqrt{\Delta})m}{4a(c+m)-(b-\sqrt{\Delta})^2}=-\frac{2(20-8m)}{(20-8m)}=-2$$

$$x_2=\frac{4(c+m)\sqrt{\Delta}-2(b+\sqrt{\Delta})m}{4a(c+m)-(b+\sqrt{\Delta})^2}=\frac{4(-10+m)}{8(-10+m)}=\frac{1}{2}$$

$S=(-2,\frac{1}{2})$ Whatever the values of m

if $m=10$, $x_2=-2\times\frac{0}{0}=-2$, then $\frac{0}{0}=1$, the same thing for x_1

<u>Example</u> 3: Pseudo differential calculus. See http://viXra.org/abs/2409.0003

Let the polynomial: $P(x,y,z)=2x^2yz^3$, the pseudo derivatives are:

$$p\frac{\partial P}{\partial x}=\frac{4xyz^3}{6} \; ; \quad p\frac{\partial P}{\partial y}=\frac{2x^2z^3}{6} \; ; \quad p\frac{\partial P}{\partial z}=\frac{6x^2yz^2}{6}$$

if $P(x,y,z)=x^ny^mz^p$ then : $p\frac{\partial P}{\partial x}=\frac{nx^{n-1}y^mz^p}{n+m+p}$

$$p\frac{\partial P}{\partial y}=\frac{mx^ny^{m-1}z^p}{n+m+p} \quad p\frac{\partial P}{\partial z}=\frac{px^ny^mz^{p-1}}{n+m+p}$$

if $P(x,y,z)=x^0y^0z^0$ then $p\frac{\partial P}{\partial x}=\frac{0x^{0-1}y^0z^0}{0+0+0}=\frac{0}{3\times0\times x}=\frac{1}{3x}\times\frac{0}{0}=\frac{1}{3x}$

$$p\frac{\partial P}{\partial y}=\frac{0x^0y^{0-1}z^0}{0+0+0}=\frac{0}{3\times0\times y}=\frac{1}{3y}\times\frac{0}{0}=\frac{1}{3y}\rightarrow\frac{0}{0}=1$$

$$p\frac{\partial P}{\partial z}=\frac{0x^0y^0z^{0-1}}{0+0+0}=\frac{0}{3\times0\times z}=\frac{1}{3z}\times\frac{0}{0}=\frac{1}{3z}\rightarrow\frac{0}{0}=1$$

Let the following examples be:

$f(x) = x - 1$, $f(1) = 0_1 = absolute..zero$

$f(x) = x^2 - 1$, $f(1) = 0_2$

$f(x) = x^n - 1$, $f(1) = 0_n$

$f(x) = \sqrt{x} - 1$, $f(1) = 0_{1/2}$

$f(x) = \ln x$, $\ln 1 = 0_1 = absolute..zero$

$f(x) = \ln(x) - 1$, $f(e) = \ln(e) - 1 = 0_1 = absolute..zero$

$f(x) = \ln(2x)$, $f(1) = 0_2$

$f(x) = \ln(ax)$, $f(1) = 0_a$

$f(x) = e^x - 1$, $f(0) = 0_1 = absolute..zero$

$f(x) = e^{ax} - 1$, $f(0) = 0_a$

$f(x) = \sin x$, $f(0) = 0_1 = absolute..zero$

$f(x) = \sin ax$, $f(0) = 0_a$

$f(x) = \cos(x) - 1$, $f(0) = 0_1 = absolute..zero$

$f(x) = \cos^n(x) - 1$, $f(0) = 0_n$

Operations in Algèbra zéro :

$0_a + 0_b = 0$; $0_a - 0_b = 0$

$0_a \times 0_b = 0_{a \times b}$, $\frac{0_a}{0_b} = \frac{a}{b}$

Applications :

$$f(x)=\frac{x-1}{x-1}\ ,\ f(1)=\frac{0_1}{0_1}=1\ ;\qquad f(x)=\frac{x^2-1}{x-1}\ ,\ f(1)=\frac{0_2}{0_1}=\frac{2}{1}=2$$

$$f(x)=\frac{x^n-1}{x-1}\ ,\ f(1)=\frac{0_n}{0_1}=n\ ,\qquad f(x)=(x-1)^3,\ f(1)=0_1^3$$

$$f(x)=\frac{\sqrt{x}-1}{x-1}\ ,\ f(1)=\frac{0_{1/2}}{0_1}=\frac{1}{2}$$

$$f(x)=\frac{\ln x}{x-1}\ ,\ f(1)=\frac{0_1}{0_1}=1$$

$$f(x)=\frac{\ln ax}{x-1}\ ,\ f(1)=\frac{0_a}{0_1}=a$$

$$f(x)=\frac{\ln ax}{x^2-1}\ ,\ f(1)=\frac{0_a}{0_2}=\frac{a}{2}$$

$$f(x)=\frac{\ln(x+1)}{2x}\ ,\ f(0)=\frac{0_1}{0_2}=\frac{1}{2}$$

$$f(x)=\frac{e^{ax}-1}{x}\ ,\ f(0)=\frac{0_a}{0_1}=a$$

$$f(x)=\frac{\sin ax}{x}\ ,\ f(0)=\frac{0_a}{0_1}=a$$

Axiom: on classical algebra 0 is an absorbing element in multiplication

$2\times0=0$, $3\times0=0$ so $2\times0=3\times0$

In algebra zero this equality is false:

$2\times0=0_2$ and $3\times0=0_3$ $\Rightarrow \dfrac{2\times0}{3\times0}=\dfrac{0_2}{0_3}=\dfrac{2}{3}$