The Binomial Expansion in terms of prime numbers, and proof of Fermat's Last Theorem

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Consider the relation ${z_{xy}}^n = (x+y)^n = x^n + y^n + rem(x,y,n)$

which is the Binomial Expansion of $(x+y)^n$ equated to the single composite value ${z_{xy}}^n$ that characterizes the individual powers of x^n and y^n as well as the interaction term $rem(x,y,n)$

(Notice that Fermat's expression ${z_{xy}}^n = x^n + y^n$ only applies for $rem(x,y,n) = 0$ which means that either $x = 0$, $y = 0$ or both, which proves Fermat's Last Theorem, since $rem(x,y,n) \neq 0$ otherwise).

To show the case for integers, note that $1^n = \frac{1^n}{\left(z_{xy}\right)^n}(x+y)^n = \frac{1^n}{\left(z_{xy}\right)^n}\left[x^n + y^n + rem(x,y,n)\right]$, where the expression can only be true for either $x = 0$, $y = 0$ so that $\left(z_{xy}\right)^n = x^n$ or $\left(z_{xy}\right)^n = y^n$

So that $1^n = \frac{(1)^n}{(1)^n}$ where division is permitted. Then for any number n , $n(1^n)$ is an integer only if $x = 0$, $y = 0$, so the Fermat expression is false if both $(x \neq 0)$ and $(y \neq 0)$

Note that from the properties of prime numbers, if x is a prime number, then so is x^n , and similarly for y so that power's ("entropies") of x or y do not affect their independence.

If $z = (c\tau') = x(c\tau) - y(v\tau')$ then

$$z^n = (x(c\tau) - y(v\tau'))^n = x(c\tau)^n + y(v\tau')^n \pm rem(x(c\tau), y(v\tau'), n)$$

Setting $z = c\tau' = 0$ means that $x(c\tau)$ and $y(v\tau')$ must be prime numbers, so that each additive term of $rem(x,y,n)$: $x^{n-k}y^k$ must be a product of prime numbers, where $n-k = \log\left\{\exp[(x(c\tau)^{(n-k)}]\right\}$ and $k = \log\left\{\exp[(y(v\tau')]^k\right\}$

The situations in which there is no final state so that ${z_{xy}}^n = {z_{-xy}}^n = 0$, but the interaction operation continues so that $rem(x, y, n) \neq 0$ is characterized by the expressions

$$0^n = (x+y)^n = x^n + y^n \pm rem(x, y, n) \text{ ,}$$

$$(x)^n + (y)^n = \mp rem(x, y, n)$$

For physics, all existing terms are positive (as positive real numbers, so

$$(|x|)^n + (|y|)^n = rem(|x|, |y|, n)$$

If "imaginary" numbers ae included, so that $i = \sqrt{-1}$ so that $i^2 = 1^2 = -1$ and $-1 = \left(\sqrt{|i|}\right)^2 = \left(\sqrt{|-1|}\right)^2$

Then the terms x and y are positive or negative depending on whether n is odd or even. The terms in $rem(\pm x, \pm y, n)$ will be governed in the same way by the real number $x^{n-k} y^k$ which will determine the ultimate parity of $\mp rem(\pm x, \pm y, n)$ where x^{n-k} and y^k are prime individually.

For physics, terms of even parity will exist in the expression, but those with odd parity will be imaginary (make of this what you will… or ask me ☺.

The (Relativistic) Derivative

$$y'(v\tau') = \frac{x(ct)}{y(v\tau')} x(c\tau) + z(c\tau')$$
$$z(c\tau') = 0$$
$$y'(ct) = \frac{x(ct)}{y(v\tau')} x(c\tau) = A\left[x(c\tau)\right]$$

$x(c\tau)$ and $y(v\tau')$ are prime numbers.

$$A = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$
$$h = y(v\tau')$$
$$A = \lim_{y(v\tau') \to 0} \frac{f\left(x(c\tau) + y(v\tau')\right) - f\left(x(c\tau)\right)}{y(v\tau')}$$

(It is tough trying to understand the Universe from the business end of a geodesic… ☺