$(+\infty) + (-\infty) = 0$

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1 $+(a_n)$ is a vector

I first need to explain the notation $+(a_n)$.

- n is the number of dimension of the vector.
- a_n is the value at the n^th dimension of the vector.
- (a_n) is the set of all the a_n values making the vector.
- The + or the - is the direction of the vector.

1.1 $+(a_n)$ is also a point

A point is a mathematical object which is alwasys a member of at least one set. Indeed, even if there is only one point, there exists a set A that includes the given point.
The point is denoted by

$$(Xa_n) = X(a_n) \text{ where X is either + or -.}$$

Note there is a very special point that could be called the origin which is denoted by (0).

$$(0) = (0_n) \text{ where n is the cardinality of the set it is included in.}$$

2 $-(a_n)$ as an opposite to $+(a_n)$

The + sign in the notation $+(a_n)$ is optional. Indeed, we could distribute the direction to every value of the point in the set and write :

$$+(a_n) = (a_n)$$

The - sign denoting the opposite direction, we could write :

$$-(a_n) = (-a_n) = +(-a_n) \text{ where } -a_n \text{ is the opposite value of } a_n$$

3 $+(\infty)$ as $(+\infty)$

Let $+(k_n)$ be a point.
Let each k_n be superior to 0.

The, $+(\infty)$ can be defined as $+(k_n)$ where n is the defined by the infinite loop :

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for (n = 1, n > 0, i++) {
  k takes any value superior to 0
}
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4 $-(\infty)$ is the opposite of $(+\infty)$

Let's recall that $-(a_n) = +(-a_n)$, and the $+(\infty) = +(k_n)$ where $k_n > 0$.

We can than say that $-(\infty) = -(k_n)$ where k_n is superior to 0.

We can finally say that $-(\infty) = (l_n)$ where l_n is inferior to 0 and $l_n = -k_n$

5 Conclusion

We can now add our two vectors.

$$+(\infty) + -(\infty) = (k_n) + (l_n) \text{ where } k_n = -l_n$$

We can now conclude that the sum of these two vectors results to the orgin pint denoted by (0) that we write 0 as a syntaxic sugar.