Corellation between math, logic and truth

Science, Mathematics

It is only thinmathematics, wherein a binary truth-false system holds that we are able to discern a true from a false. This essay will argue that, within mathematics, the claim to an absolute truth is warped and self-contradicting, and as a result, processes that search for truths outside mathematics are to be contained within their respective realms of applicability. In other words, the soundness of a truth should not be based on an absolute dichotomy, but rather as a spectrum of validity where locality and scope are cornerstones of validity.

Let us however, allow this essay to begin the discussion by assuming that such absolute distinctions are plausible. In mathematics, a truth is defined as any statement that can be deduced from a logical, valid, sound process with the respective given assumptions. In other words, a truth is something that, assuming the same axioms, should follow directly with the irrefutable laws of logic. A falsehood must therefore be any statement or claim that cannot be sustained by a valid logical process with the given assumptions. Let's take the example of Pythagoras, whose famous theorem is ubiquitous to this day.

Pythagoras assumed a Euclidean plane system and used past theorems to rove his own. It is not his proof that will be the focus of this essay, but the process. Pythagoras developed his proof through the method of abstraction, that is, he removed all connections that his ideas had with the real world: " He realized that numbers exist independently of the tangible world and therefore their study was untainted by the niacin racier of perception"(Sings 5). Indeed, the goal of this process was to " discover truths that were independent of opinion or prejudice and that were more absolute tan any previous knowledge. " (Sings 5).

The process of abstraction is of keen interest, cause it implies tattoo can effectively create truths that are independent of all experience or emotion. However, I will later demonstrate the process of abstraction is subject to questioning when it claims the right to absolute truths because of the restrictions that axioms undertake. Assuming different axioms stands as a strong counterpoint to question the validity of absolute truths through the process of abstraction. Particularly, this consideration attacks the assumption of truth as ubiquitous, and challenges the locality, or context, in which a truth holds.

Again, let us take the example of Euclidean geometry. Euclidean geometry follows the bread and butter 5 postulates that Euclid first proposed. However, his 5th postulate, with slight ; easing, creates worlds that are completely different from the flat planes and static dimensions. Both Albatrosses and Belittle took a different meaning of the 5th postulate. Albatrosses assumed that parallel lines actually do not stay at the same distance Over infinity, but rather diverge from one another; Belittle proposed that they eventually get closer and collide.

The discoveries and rather theorems that these mathematicians proposed turned the world on its head. How do these new geometries challenge the assumption of locality in an absolute truth? As it turns out, the elliptic and hyperbolic geometries had earned more than a place but a right to be considered as legitimate mathematics. Hyperbolic geometry adequately fits in to the general theory of relativity, which has a massive predicting power and has robust empirical support. Elliptic geometry now finds a place with

GAPS tracking devices and is extremely handy for use in spherical coordinate systems.

The crazy new idea f tweaking Culicid's 5th postulate had now to be seriously reconsidered: They were derived through the process Of abstraction and followed sound logic, but could these mathematics claim to be a more " absolute" truth than the Euclidean geometry? Eugene Wagner, a mid 20th century mathematician and physicist, would respond that yes, all of them would have to be considered equally. Wagner was heavily concerned with the puzzle that mathematics in the natural sciences create.

How is it that abstract ideas, which have been effectively detached from the real world, are able to model it so precisely? To he physicist, the mathematics that is able to model relativity or the Earth is to be considered, and should therefore consider them to be pursued in terms of utility. Wagner concludes his essay on The Unreasonable Effectiveness of Mathematics in the Natural Sciences with a key phrase: " The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve. (Wagner 9) From the scientific point Of view, truths are viable only to the extent to which they can improve what we can say about the workings of tauter. Although this would seem like a correct approach to employ, it is unrepresentative of the role of mathematics. Mathematics is not concerned with physical probabilities, they only care if they could construct a world based on a fixed set of ideas. For the mathematician, any one mathematical world constructed under one set of axioms is by no means superior or inferior to any of the other worlds they could construct with a different set of axioms.

Does it portray nature accurately? It doesn't matter! It is of no relevance that what holds up in one mathematical world as true holds evidently false in another world constructed by mathematics. In thisrespect, any truth that is obtained in mathematics is absolute only to the world to which it belongs. This means that it is not truer that the construction of mathematical worlds (base ten, hyperbolic geometry, etc.) that can model nature are more absolutely true than any other another mathematical world (clock math, known as modular arithmetic) constructed under a different set of axioms.

Claims to absolute truth are restricted to their respective realms of applicability of assumptions; the local applicability and restriction to truth is hat the element of locality takes when assessing the validity of a truth. However, this question has to be severely questioned with respect to the false dichotomy which it establishes immediately - the exclusiveness of self-contained dipoles of truth in mathematics is rather a weakness.

Because you start out with a particular set of axioms, which were defined by the entrepreneurial mathematician in the first, and then followed logically, it should be of no surprise that all results fall under neat binary cabinets of truth. What must be considered next is that the majority of claims to truth, outside of self-containing knowledge worlds, are subject to a juxtaposition of truth and falsehood, or the complete breakdown of the dichotomy. The foremost example can give with respect of the natural sciences is that of the observer in quantum physics.

In a nutshell, when the scales of things are shrunken to sub-atomic sizes, the behavior of matter changes drastically. Particles can no longer be understood as solid masses in space, but rather as waves, which have a certain probability of existing at a certain point in time when observed. The intriguing part is that, when not observed, there is no laid truth or falsehood about the " object" being either a wave or a particle. This becomes even more complex when we scale this problem back to the size of humans: the physical principle no longer applies!

Not only does this challenge the notion of an absolute ubiquity of truth, but also that of scope, which necessitates that when statements are qualified as a truth or a falsehood, a consideration must be made to the context of the truth and the implications of the truth. How does this judgment fare when exported to the subjective sphere? Unfortunately, I happen to find the discerning of the trial sciences too complex for my sometimes apprehensive social inclinations.