comparing numerical systems

The revised numerical system of arithmetic, algebra, analytic geometry, analytic trigonometry and calculus presented and elaborated throughout this work is at least as internally, mathematically consistent as its counterparts under the conventional numerical system. Theoretically, any number of numerically and axiomatically self-consistent, invented systems can be created just as the modern, conventional system was created in the past. In fact, there are presently many models of arithmetic (MSC 03C62) available in the literature.

With adequate mathematical material provided, the revised system as presented can be verified as numerically and axiomatically self-consistent. Presumably, the material at hand also enables one to generate contradictions or isolate any unrecognized inconsistencies- fatal, major or minor. Ultimately, unless a fatal or major flaw is uncovered, then an objective evaluation of the two systems that are isomorphic in a holistic sense by their comparative attributes is required for defensible academic practices.

An objective evaluation is not a straightforward task, even for a person thoroughly knowledgeable in the relevant analytical and axiomatic areas. In actuality, it is very difficult to consistently distinguish between foundations, properties, structures and functions which are absolutely vital to <u>any</u> legitimate, universal system of mathematics and those exclusively characteristic of the conventional system which are merely relative, tenuous ramifications.

An indicative example of an abstract fixation, typical to the conventional viewpoint, manifests as an inadequate logical comprehension of this theory.

Under the revised system, after the unit imaginary number, complex number system (and in theory, an infinite number of hypercomplex number systems) have been precluded from existence at the level of revised arithmetic (specifically, in revised multiplication), it is impossible and unnecessary for them to mysteriously reappear in any way, either explicitly or implicitly, within legitimate problems in revised analytic trigonometry or revised calculus. In fact, <u>every</u> legitimate problem, interaction or phenomenon is now expressible within the revised real number system exclusively.

Various problems posed from the viewpoint of conventional mathematics may or may not have any theoretical existence, applicability or isomorphic solutions in revised mathematics. Nonetheless, the loss of those conventional problems (and their solutions) provably having absolutely no importance to revised mathematics would therefore also have absolutely no importance to modern mathematics based upon revised mathematics.

Ultimately, numerous value judgments are implicitly involved at foundational levels within each branch of mathematics. Guidelines to correctly make such determinations are not known in some cases. Nonetheless, all of this is prerequisite to being able to make an incisive, objective evaluation across the various topics encountered by this project. This illustrates the problematical nature of comparing various models of arithmetic in search of the best standard. After all, I think I can safely surmise that few mathematicians (who prefer calculable and provable problems) really want to address and deal with open, complicated, messy, quasi-philosophical matters.

By comparative criteria including (as well as going far beyond) those mentioned, a tentative determination as to which is probably a superior system can be made within a reasonable time. If said results are promising, then this could be followed-up by a more thorough, detailed and critical investigation of an abstract mathematical, computational, axiomatic, conceptual and foundational nature.

<u>Any</u> exact science (mathematics, most of all) is required to be correct, accurate and concise to the greatest extent possible. Therefore, if this theory is valid, substantial revision throughout arithmetic, algebra, analytic geometry, analytic trigonometry and calculus will be necessitated. The direct result would be a revised numerical system which is different computationally, markedly simpler, perfectly symmetrical and more applicable. Hence, the importance in making a definitive determination as to which is a better system vastly outweighs its required difficulty and commitment of resources. Few mathematicians, at any given time, are otherwise working on anything important, anyway.

Comparatively, no differences exist between the revised and conventional systems in pure geometry, plane trigonometry and vector algebra. There are only minor, formalistic adaptations involved with converting between the respective notations of the two systems.

Essentially, analytic geometry, analytic trigonometry and calculus are tools or techniques for abstract, exacting extrapolation from basic numerical and geometric truths. Defined along such lines, these higher branches of mathematics are wholly dependent upon the foundational branches (i.e., arithmetic and geometry) as the ultimate subjects of study.

In any event, analytic geometry and analytic trigonometry reflects the underlying differences in arithmetic and algebra between the two systems. Accordingly, two graphs of the same function or two functions defining the same graph are rarely or never identical between the revised and conventional systems of representation.

In turn, differential and integral calculus reflect certain underlying differences in analytic geometry and analytic trigonometry between the two systems with their unique, characteristic, contrasting function-graph relationships.

In summary, <u>all</u> branches of mathematics involving analytical/numerical systems, whether or not they also involve geometrical systems, are significantly affected having revised counterparts. Under consideration is most of pure mathematics and applied mathematics (at least, in their formal notation). Only exclusively geometrical systems are unaffected, remaining conventional in every case.

Although only a light survey of the various branches of higher mathematics, mathematical physics and engineering sciences has been undertaken, no legitimate branch, area or problem encountered thusfar presents a crisis or impasse to mathematical modeling under the revised numerical system. Moreover, a limiting mechanism to the otherwise theoretically-unlimited capability of representing an isomorphic, universal system has been shown (via this work) to be highly improbable. By definition, isomorphism between two universal systems is either fully-applicable or non-applicable. In other words, isomorphism between two universal systems either exists or does not exist.

All of the groundwork of this paper, with its interactive, mathematical self-consistency, was designed to prove the legitimacy and efficacy of the perfect symmetry number theory. Realistically, it is probably impossible to devise a non-isomorphic, fraudulent numerical system which can be methodically modeled and demonstrated through five branches of mathematics (arithmetic, algebra, analytic geometry, analytic trigonometry and calculus) with their intrinsic complexities and restrictions while retaining self-consistency, structures, perfect symmetry, <u>greater-than-maximal</u> applicability, <u>lesser-than-minimal</u> completeness (or conciseness of form). Therefore, it is far more likely that the revised system truly is isomorphic to the conventional system in its precise representation of universal, mathematical reality throughout calculus (and every natural science and mathematical science involving calculus, explicitly or implicitly).

Even if the revised (perfect symmetry) number theory is somehow not credited with general superiority to the conventional (broken symmetry) number theory, its definite, comparative advantages in many areas establish it as a productive, informative field of study and worldview in number theory, foundations and philosophy of math. In such a case, its recognized importance should be somewhat analogous to that of the non-Euclidean geometries in comparative geometry.

At least, with a bit of constructive creativity or imagination, it could be applied as a useful tool somehow, somewhere within the vast range and variety of mathematical studies and activities. In summary, the significance of this work to mathematics is virtually certain and guaranteed to those who have studied it and understood it.

Alternatively …

Q- What would happen IF the revised (perfect symmetry) number theory were (justly) credited with general superiority to the conventional (broken symmetry) number theory?

What would become of the vast mathematical literature based upon conventional number theory?

A- What should become of the vast mathematical literature based upon conventional number theory.

So, how can we correctly define "should" in this case? Realistically, I can only assess the error-ridden condition of it as totally hopeless.

Accordingly …

1. **All pure mathematics based upon conventional number theory could (and should) be safely discarded with prejudice immediately. Since nothing of value is known or probable to exist there, no rational purpose exists for anyone to try to salvage anything there. Over time, pure mathematics hopefully consisting of select, quality works with possible future importance would be rebuilt on an error-free foundation of revised number theory.**

2. **All applied mathematics based upon conventional number theory should be kept only until they can be replaced as soon as possible one-work-at-a-time by applied mathematics based upon revised number theory. Of course, this vast enterprise would require a lot of hard work (for a change) from a lot of applied mathematicians. After being successfully replaced by error-free counterparts, the original mathematical works could all be safely discarded with prejudice as well.**

The fact that many people for centuries have thought, worked and for the most part, wasted their entire careers creating this garbled mass of junk (with minimal value) called the worldwide mathematical literature is tragic and unfortunate. Hopefully, mathematical academia can and will learn from its huge, costly, unsalvageable mistakes and numerous, long-standing "bad science" practices that blatantly violated the scientific method and at least, do a better job next time. Notwithstanding, there is no justification at all, by scientific and academic standards, for sentimental attachment to mathematical works once they have become useless, obsolete and provably wrong or erred.

An alternative number theory can overwhelm the patience and adaptability of many mathematicians. Nonetheless, since the heart of the perfect symmetry number theory lies within arithmetic, it is accessible, readily-provable and can clearly be envisioned without excessive dependence upon mindbending, abstract mathematics.

Three demo programs for revised arithmetic (and areas foundational to it) provide immediate, clear feedback and confirmation when one is on track in understanding this alternative yet superior number theory. The effort invested reveals very interesting theoretics as well as issues of importance to mathematics as a whole.

By the way, the indisputable fact that demo programs for revised arithmetic exist and work perfectly instead of generate inconsistent, random and/or useless answers that cannot be rationally worked back to their starting place is <u>evidence and working proof of the self-consistency of revised arithmetic</u>.

Rest assured, I understand and accept that anyone has the right to tell me,

> **"You are making a strong assertion.**
> **So, the burden of proof lies entirely upon you.".**

This demand is reasonable and consistent with the scientific method. After all, skepticism is the nature of good science and its standards of quality must be protected. In the course of this work, I have compliantly attempted (successfully, in my studied opinion) to fulfill this demand in many ways.

For an analogy with a historic twist …

I would expect that if I told a physicist over a century ago that I knew how to build the first working radio, even if my explanation made sense in principle, he/she would naturally be skeptical that I could really turn the dream into reality. However, I would <u>not</u> expect to still be treated like a dumbass or nut <u>after</u> I turned the device on and let him/her hear it broadcast.

I hate to inconvenience anyone by putting them into the uncomfortable position where I am rightfully demanding that they actually wake-up, act like responsible mathematicians and do some work (as I have) of importance via examining my proof and verifying it but I have laid it all out for you neatly "on a silver platter" … and I am still waiting.

Apparently, "the system" has no provisions in place (although it should) for a rare (presumably) yet undeniably-possible, human error situation that ideally, should never occur yet realistically, almost certainly has occurred and will occur in numerous unknown places within the vast body of mathematical literature where an error in mathematics by one mathematician is <u>not</u> caught by peer review (if any) in the era (in some cases, ancient) when it is originally made. So, <u>the error is admitted into mathematics and becomes a standard</u>. In subsequent generations, <u>all</u> of the standards of mathematics are vigilantly protected … including the error, unfortunately.

> **Q- What can be done to purge an error from the standards of mathematics and repair or correct the standards of mathematics accordingly?**

"Nothing" is not even close to an acceptable answer.

If the modern-day reality is that "the system" absolutely does not ever function that way, then "the system" needs to arbitrarily reform itself to function that way- only in highly-unusual situations that justify it. There is no adequate, ethical or academic, excuse for the mindless perpetuation of "dereliction of duty" in the natural sciences through an unknown number of future generations.

Please try to understand it from my point of view?

Since I am convinced that a serious error (obvious, stupid and directly causing bad consequences) has been admitted into, never detected and never removed from basic arithmetic (after appr. 14 centuries), at relatively the lowest level of abstraction, it seems overwhelmingly probable that undetected errors (some serious) must also exist in moderate numbers at the medium level of abstraction and must also exist in great numbers at the highest level of abstraction. Thus, I am incapable of trusting any reassurances to the contrary from any "experts in mathematics" who routinely use the same type of circular logic to self-justify their positions as people who have thrown me out of their offices for trying to explain how conventional multiplication is flawed.

When you observe that for many years, virtually all mathematics journals have been filled with works at the highest level of abstraction, intentionally and somewhat unnecessarily for prestige, then you may wisely reconsider my assessment that the worldwide mathematical literature is "a garbled mass of junk (with minimal value)" as <u>not</u> being too harsh after all. I would dare bet that virtually all mathematical works at and above a presently undefined (perhaps, moderate) level of abstraction, are so riddled with errors and/or heavily, foundationally based upon errors, they will eventually be discovered to be worthless for all practical purposes. Of course, this will be true to a much greater extent for pure mathematics than applied mathematics.