Riemann Hypothesis: Preliminary comments

Number theory is viewed as a formalisation and extension of counting.

An underlying thought is that actual counting is fundamental to our reasoning

In number theory, results are derived by following agreed rules and reaching new or modified outcomes.

As the exploration of an area of activity becomes more detailed the process of peer review is employed to guide direction.

In the middle ground between knowing nothing in an area and being an expert there is a goodly collection of enthusiastic amateurs who enjoy activity in the knowledge realm.

The author lies somewhere in this middle ground with an early interest in number theory and a D. Phil. Thesis 'Topics in Number Theory' under the supervision of Emeritus Professor Teddy Zulauf and ten years of lecturing in general undergraduate mathematics.

The question of the classical Riemann hypothesis has remained a personal interest over the years along with other topics which came to light in earlier research.

The following paper came about following the thought that there may be 'nothing left to prove' in the sense that all the key ingredients were assembled.

De Brange in his apology demonstrated that mathematics had seemed to do just about all it could do to prove the Riemann hypothesis. He almost certainly had located a realm in which he believed the problem solved even though the detail was not reported correctly.

Whether the problem is solved in an acceptable way in the near future is an open question but there is some momentum which indicates a possible answer may be available sooner rather than later.

An extension of counting will remain sensible if it is a countable number of agreed 'chunks' of reasoning glued together.

Mathematical induction has its limitations.

There is no computation which could verify the validity or otherwise of an unbounded logical chain and the statement 'for all natural numbers' is not one which can be verified by computation.

The attempt is made to link the concepts of logical implication and provability with countability in a conversational rather than formal way.

The Riemann hypothesis is discussed as a problem which is logically equivalent to a problem which cannot ever be decided by computation.

As such it will never be possible to find an exceptional zero to refute the Riemann hypothesis.

The following paper is a first attempt to explore this approach and the website also looks to see if any other problems may find explanation in this type of thinking.

An explanation of the verification of the Riemann hypothesis needs only satisfy one simple rule: we must be sure beyond any doubt that conventional computation will never discover an exceptional zero. (See next hypertext link on www.peterbraun.com.au).