

Every discipline has its crackpots: Stories of mathematics

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I'm sure every discipline has its share of crackpots. I suspect the physicists get it the worst, starting with the old standbys of perpetual motion machines and faster-than-light travel, then tossing in quantum mechanics and nuclear physics, and stirring with large quantities of long rambling text that makes no sense. But my experience is with mathematics.

When I was in college, the mathematics department would post “interesting letters” onto the bulletin board. The ones I remember:

- A claimed proof of Fermat's Last Theorem by means of music theory. It started with $3^2 + 4^2 = 5^2$, then somehow converted this into musical notation, transposed it into another key, and then concluded that the proof was complete. There were many “proofs” of Fermat's Last Theorem on the bulletin board.
- A letter from an inmate at a correctional facility who had developed a system for winning the lottery and merely needed a printout of all possible ways of choosing 6 numbers from a pool of 46.

A number theorist working on factorization explained to me that he would frequently receive “manuscripts” from people who claim to have found a high-speed algorithm for factoring large numbers. At first, he would take the time to study these manuscripts, and each time he would determine that the algorithm boiled down to trial division, often cleverly-disguised trial division, but trial division nevertheless. (Though when this was pointed out, the authors often rejected his analysis.) Eventually, he realized that he could separate the wheat from the chaff very easily by simply replying with the following message:

Thank you for your fascinating manuscript on the factorization of large numbers. There are some numbers that have been giving me difficulty of late. I would be most appreciative if you could use your technique to factor this one for me.

Upon which he would include a number whose factorization would take years on generally-available computational hardware at the current state of understanding. He never heard back from these people.

Another of my professors told a story of one “correspondent” who was convinced that the speed of light could be overcome. (Yes, that’s actually a physics question, not a mathematics question, but it was sent to the math department anyway.) The professor started by trying to explain the principles of special relativity to his new pen-pal but quickly realized that wasn’t going to lead anywhere. The correspondence was quite pleasant; the other person was a retired gentleman who gardened and enjoyed going for walks when he wasn’t working on pushing the envelope of modern physics. At one point, the correspondent wrote back a multi-page letter consisting of crayon drawings that proved that the speed of light could be exceeded. It went something like this:

The first page consisted of a drawing of the earth with a little rocket ship in orbit around it.

Consider a rocket ship that circles the earth once a day. This rocket is travelling at 463.831019 meters per second.

Say what you will, but these people never suffer from the problem of too few significant digits.

Now imagine that each day, the time it takes to circle the earth **SHRINKS IN HALF**.

So that on the **SECOND DAY** it takes only **twelve hours** to circle the earth at a speed of 927.662037 METERS PER SECOND.

The rocket ship on the second day has a few extra zoom-lines on it.

By the **THIRD DAY** it takes only **SIX HOURS** to circle the earth at a speed of **1855.32407 METERS PER SECOND**.

The rocket ship on the third day is going a little faster.

Each page consisted of a daily status report on our little rocket ship, illustrated in glorious crayon, each drawing more elaborate than the last. As the rocket ship goes faster and faster, the report on its speed gets bigger and bigger. I’ll skip ahead a bit.

On **DAY TWENTY**

the rocket ship circles the earth in **164.794922 MILLISECONDS**

at a speed of **243,181,037 METERS PER SECOND**

Finally, the hammer falls:

On **DAY TWENTY-ONE**
the rocket ship circles the earth

in only **82.3974609 MILLISECONDS**

at a speed of **486,362,075 METERS PER SECOND.**

IT HAS BROKEN THE LIGHT BARRIER.

The professor realized the jig was up. He wrote back, “Yes, it looks like you’ve done it.”



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