But It Looks So Simple

Are you, like me, thankful for Goldbach's Conjecture? If asked for an example of how the most straightforward of questions can refuse to yield to the best efforts of the top mathematicians, this hypothesis, that every even number greater than 2 can be written as the sum of two primes, is a good riposte.

"Even? You know what that means? Prime? Get the problem? Go away and check it out." This is what I said one day to Terry, a tiresome and thoughtless student who would constantly pester me for extra work (what a liberty!) Three minutes later, Terry came back with half a sheet of A4. "It's obvious, sir," he said casually. "I've proved it."

Just for a moment, I wondered whether Terry had proved it. I could see the photo on the front page of the TES, with Terry holding a cheque for a million pounds while I stood with a fatherly arm around his shoulder, saying "That's my boy!" I inspected his proof with feverish anticipation, only to discover that Terry's understanding of a prime number did not match with that of the wider mathematical community. "Right, Terry, I've got another problem for you – there was a mathematician once called Riemann…"

Goldbach's Conjecture is something of a misnomer. Goldbach's actual conjecture (in a letter to his friend Euler) was that "all whole numbers larger than 5 can be written as the sum of three primes." Euler replied that he preferred his version, that "every even number larger than 2 is the sum of two primes," which would imply Goldbach's initial conjecture if true. Goldbach's original conjecture remains unproved too, but is much closer to succumbing than the one that bears his name. (Clearly everyone felt that Euler had enough in the way of conjectures attributed to him.) Perhaps it would have been fairer of me to set Terry this weaker version of the conjecture. "Now listen, sir, this really IS obvious…"

I remember the university talk where we students gave our lecturer, one of the top three number theorists in the world, a respectful silence. He was not, sadly, one of the top three mathematics communicators in the world, being a shy man who would clearly have been more at home in front of a pencil and paper. He had decided to pass on to us news of a close attempt at proving Goldbach, Chen Jingrun's result of 1973 that every sufficiently large even number can be written either as the sum of two primes, or the sum of a prime and a semiprime (the product of two primes).

"Every… sufficiently… large even number," he ploughed unhappily on, wiping sweat from his brow, "Can be written either as the sum of two primes, or the sum of a prime and another number…"

At this point, he paused for a much-needed sip of water. His audience were given just long enough to appreciate the achievement involved in proving this last ‘theorem’. The lecture theatre collapsed into laughter and cheering, leaving our poor teacher completely baffled. Far be it from me to defend such unkind, discourteous behaviour (I can promise you that I wasn’t laughing), but I feel sure that never can stopping for a glass of water have elicited such an impressive response. Maybe somewhere Goldbach was laughing too.

Jonny Griffiths teaches at Paston College.

www.jonny-griffiths.net