Prime counting connections

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One of the more subtle and effective charges raised against my work over the years is that it's just a copy of what mathematicians already had.

Over the years I've tried various ways to answer that charge, typically focusing on hard facts−−necessarily as they're mathematical−−which refute it, but it keeps festering, and I think it might work better to explain the connections.

My prime counting function has as a key function dS(x,y), which is the count of composites up to and including x that have y as a factor which do not have any primes less than y as a factor.

For instance dS(4,2) = 1, as 4 is itself a composite that has 2 as a factor, and 2 is the first prime, so there are no primes less than it.

Notice that dS(100,4) = 0, as you know that any composites that have 4 as a factor must have 2 as a factor, since 2 is less than 4.

And notice that dS(10,2) = 1, as though the composites divisible by 3 up to and including 10 are 6 and 9, 6 has 2 as a factor, so only 9 gets counted.

So that's the dS(x,y) function which follows from my research.

Now I have another important function called S(x,y), which is the sum of dS(x,y) functions and it is the count of composites up to and including x that have the first primes up to and including y as factors.

So S(6,4) = 2, as those composites are 4 and 6, while S(10,3) = 4, and those composites are 4, 6, 8 and 9.

Now let's go to what mathematicians found to see the connection and also see how some math people fooled some of you quite effectively.

It's rather interesting.

You see, mathematicians found a sieve function they typically call phi(x,a), which is the count of naturals up to and including x that are NOT divisible by the first 'a' primes.

For instance, phi(10,2) is the count of naturals up to and including 10 that are not divisible by the first two primes, which of course, are 2 and 3.

Well, that scratches off 2, 3, 4, 6, 8, 9, and 10, so that count is 3, and those numbers are 1, 5, and 7. Notice that I've eliminated all the composites except 1, which is what happens if you get all the primes up to the square root of x, which is what happened here.

Legendre's method is to then count back in 'a', and subtract one, so here you'd add 2 to get 5, and subtract 1 to get 4, which is the count of primes.

Several posters from sci.math have for quite some time claimed that Legendre's Formula is my prime counting function, but how could they convince anyone when they sound so different?

Remember, I use a dS(x,y) and S(x,y) function, while mathematicians have this phi(x,a) function, where they have 'a' for the count of primes, when I have 'y' to show that I'm still using regular numbers.

Well, there's a connecting formula because both formulas are counting composites.

Remember there are only a certain number of composites, like, up to and including 10, and they do not change depending on the formula or method used to count them!

So it turns out there's a connecting formula:

phi(x,a) = x − S(x,p_a) − pi(sqrt(x))

is the correct relationship as my S(x,y) function gives the count of composites up to and including x that have the primes up to and inluding y as one of their factors.

Notice I had to shift from y to p_a to match with the sieve function.

Because composites are being counted it was necessary that there be a connecting formula.

You see, my work is not Legendre's at all! It's just that if you find a way to count something that is rigid then it has to connect with other ways previous.

The math people fooled some of you rather easily with something so basic that they should never have succeeded with any of you.

Here's where it gets fun though as now you can understand the recurrence relationship that mathematicians found for their phi(x,a) from *my* research!!!

phi(x,a) = x − S(x,p_a) − pi(sqrt(x))

so

phi(x,a+1) = x − S(x,p_(a+1)) − pi(sqrt(x))

and subtracting the first from the second gives

phi(x,a+1) − phi(x,a) = S(x,p_a) − S(x,p_(a+1)) = −dS(x, p_(a+1))

so now the full connection is obvious.

Now my full prime counting function is

dS(x,y) = [p(x/y, y−1) − p(y−1, sqrt(y−1))][p(y, sqrt(y)) − p(y−1, sqrt(y−1))],

S(x,1) = 0, p(x, y) = floor(x) − S(x, y) − 1, and S(x,y) is the sum of dS from dS(x,2) to dS(x,y).

http://mathforprofit.blogspot.com/2004_03_01_mathforprofit_archive.html

My research is new. It connects to past research somewhat by the relationship I've shown you which because phi(x,a) is a sieve function requires a specific prime, which changes dS(x,y) into

dS(x,p) = p(x/p, p−1) − p(y−1, sqrt(y−1))

which as I've shown is the negative of a difference between successive phi functions.

So then the outlines of the crime are completely clear, as sci.math'ers had one definite point they could rely on, which is that the count of primes is the same from method to method, so my research, since it gives the correct count, had to connect with past research.

So they just pointed at similiarities, cried foul and claimed my work was old, when not only is it new, but I can explain things mathematicians don't seem to have understood.

Like, reading through math texts on the recurrence relationship for phi I don't see an explanation for the *why* of it, but I can give it to you quickly.

My dS(x,y) function, remember, is the count of composites up to and including y that have y as a factor that do not have any primes less than y as a factor.

So with y a prime to keep it simpler,

dS(x,p) = [x/p] − 1 − S(x/p,y−1) − p(p−1,sqrt(p−1))

as you take the count of composites that have p as a factor, which is

[x/p] − 1,

and then subtract the count of composites that multiply times p that are less than x, which have prime factors less than p, which is S(x/p,y−1), and then you subtract the number of primes less than p−1, as that gives you simple composites like 2p and 3p that need to be subtracted, and that gives you your final count.

It turns out that

p(x,y) = [x] − S(x,y) − 1,

which is the say you can subtract the count of composites from x and subtract 1 for 1 itself, as it's not prime, and in fact, if y =sqrt(x) that formula gives the count of primes, like

p(10,3) = 10 − S(10,3) − 1

and the count of composites up to and including 10 that have 2 and 3 as factors is 5, as those numbers are 4, 6, 8, 9, and 10, so I get p(10,3) = 4, and those primes are 2, 3, 5 and 7.

So you can substitute

p(x,y) = [x] − S(x,y) − 1,

and simplify to get

dS(x,p) = p(x/y,y−1) − p(p−1,sqrt(p−1)))

and now go look at what mathematicians had, but unlike them, for over a hundred years, you know exactly what you're looking at.

Apparently, they NEVER figured it out, and when I came along and explained it, sci.math'ers ripped on me.

They changed the rules people.

They punished me for making discoveries, and fooled many of you.

They changed the rules.

It's like a group of people watching someone run a world record time and then lying to the world about it.

The math people lied to you, and they are still lying, and seem intent on continuing to lie indefinitely.

Hey, it's on you though. If you think you gain something when math people lie to you about mathematics, then let them get away with it.

Let them have the power to ignore accomplishments.

Then let them change the world in that way.

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