Re: Pi and the distribution of prime numbers

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From: Jim Spriggs (*jim.sprigs_at_ANTISPAMbtinternet.com.invalid*)
Date: 02/09/05

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José Carlos Santos wrote:
>
> *Hi all,*
>
> *At the MathWorld page dedicated to pi, located at*
>
> *http://mathworld.wolfram.com/Pi.html*
>
> *it is claimed that pi "crops up in all sorts of unexpected places in*
> *mathematics [...]. For example, it occurs in [...] the distribution of*
> *primes". Does anyone know what's the connection? Or is it a confusion*
> *between the number pi and the prime counting function (usually denoted*
> *by pi)?*

Well, I don't know about _distribution_ of the primes, but one proof
that the sum of the reciprocals of all prime numbers diverges to
infinity uses

  log log n − log(pi^2/6) < sum_{p <= n} p^{−1}

where the sum is over primes.

It would be nice to know a small blah so that

  log log n − log(pi^2/6) < sum_{p <= n} p^{−1} < blah.