

Re: Quadratic Sieve & Smooth Numbers

Source: <http://sci.tech-archive.net/Archive/sci.math/2004-08/2117.html>

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"Russell Harper" <rharp1661@rogers.com> wrote in message
news:<JW9Sc.1619732\$Ar.1075042@twister01.bloor.is.net.cable.rogers.com>...
> In <http://mathworld.wolfram.com/SmoothNumber.html>, it gives the number of
> random numbers which must be examined to find one which is k -smooth as
> $\pi(k)n/\psi(n, k)$. Does anyone know an easy approximation to $\pi(k)n/\psi(n,$
> $k)$?
>
> More specifically, considering a Quadratic Sieve, there is an ideal factor
> base of k primes, what is the probability that an integer $\sim n^{1/2}$ is
> k -smooth?
>
> Thank you,
>
> Russell

The probability that integers up to x are y -smooth is $u^{-u + o(1)}$
where $u = \ln x / \ln y$, assuming $y > (\ln x)^{(1 + \epsilon)}$.

You should get Pomerance and Crandall's Prime Numbers book.

Scott