

Limitation on Trial Division

Asymptotic formula for m th prime, p_m :

$$p_m = m \ln m + O(m \log(\log(m)))$$

To factor a 50-digit composite (C50), need primes up to $\sqrt{(10^{49})}$.

formula gives 10^{23} primes less than $5.693 * 10^{24}$

For a C70, there are 10^{33} primes less than $8.03 * 10^{34}$

And 10^{49} primes less than squareroot of a C102.