Project Euler.net

Quadratic primes

Problem 27

Euler discovered the remarkable quadratic formula:

$$n^2 + n + 41$$

It turns out that the formula will produce 40 primes for the consecutive integer values $0 \le n \le 39$. However, when $n = 40, 40^2 + 40 + 41 = 40(40 + 1) + 41$ is divisible by 41, and certainly when $n = 41, 41^2 + 41 + 41$ is clearly divisible by 41.

The incredible formula $n^2 - 79n + 1601$ was discovered, which produces 80 primes for the consecutive values $0 \le n \le 79$. The product of the coefficients, −79 and 1601, is −126479.

Considering quadratics of the form:

> $n^2 + an + b$, where $|a| < 1000$ and $|b| \le 1000$
>
> where $|n|$ is the modulus/absolute value of n
> e.g. $|11| = 11$ and $|-4| = 4$

Find the product of the coefficients, a and b, for the quadratic expression that produces the maximum number of primes for consecutive values of n, starting with $n = 0$.