November 8, 2016

Go back to the beginning before any knowledge. Fully understand everything from the beginning, numbers, primes, factorization.

1 primes

Numbers are just functions $n\colon \mathbb{N} \to \mathbb{Z}$. Multiplication is given by

$$(n \star m)(i) := n(i) + m(i).$$

The greatest common divisor is

$$\gcd(n, m)(i) := \min\{n(i), m(i)\}.$$

The really interesting operation is addition.

$$(n \dagger m)(i) := ???$$

The k-th prime for $k \in \mathbb{N}$ is given by the Kronecker delta:

$$p_k(i) := \delta_{ki}.$$

With this we can state some properties of $\dagger$ and $\star$. We have

$$\begin{aligned}
a \star (b \star c) &= (a \star b) \star c \\
a \dagger (b \dagger c) &= (a \dagger b) \dagger c \\
n \star m &= m \star n \\
n \dagger m &= m \dagger n \\
a \star (b \dagger c) &= (a \star b) \dagger (a \star c) \\
a \dagger (b \star c) &= (a \dagger b) \star (a \dagger c) \\
n \dagger n &= p_0 \star n
\end{aligned}$$