I think the next classically well known proof.

Theorem
Prime numbers are infinitely exists.
Proof)
I suppose prime numbers are finite.
$p_1, \ldots, p_n$ are these prime numbers.
Then $p_1 \times p_2 \times \cdots p_n + 1$ is not divided by all prime numbers $p_1, \ldots, p_n$.
The numbers of Prime numbers are $n + 1$. This is the contradiction.
Prime numbers are infinitely main.

So, if 2, 3, 5, 7, 11, 13 is the limited prime numbers, then $2 \times 3 \times 5 \times 7 \times 11 \times 13 + 1 = 30031$ is Prime?
30031 is the convolution number.