# PROOF OF PRIMES OF SOPHIE GERMAIN.

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## 1 Introduction.

A number of Sophie Germain is a prime number p for wich $(2p + 1)$ is a prime number.

The proof is based on the method of reduction to absurdity, tha is, I suppose that there exist a last Sophie Germain prime number and after performing some simple mathematical operation, a false result is obtained.

## 2 Demonstration.

Let $p$ the last prime Sophie Germain, $\Rightarrow 2p + 1$ is a prime number.

Let $(p + 2n)$ a prime number, where $n$ is a natural number for wich $(p + 2n)$ is a prime number. Therefore, $(p + 2n)$ are all prime numbers greater than $p$.

$2\,(p + 2n) + 1 = (2p + 1) + 4n = p + 2n + (2n + p + 1)$. As $p + 2n$ is a prime number, and $(2n + p + 1)$ is a even number determinated by $p$ and $n$, and $n$ is one of the infinite natural numbers for wich $(p + 2n)$ is a prime number.Since the set of primes numbers is infinite, it must exist at least one $n$ for wich the number$(2\,(p + 2n) + 1 = p + 2n + (2n + p + 1))$ is a prime number.

Therefore $p$ is not the last prime of Sophie Germain.

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