

There Is No Largest Prime Number

With an introduction to a new proof technique

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Symposium on Prime Number, –280

Outline

1 Results

- Proof of the Main Theorem

Proof That There Is No Largest Prime Number

A proof using *reductio ad absurdum*.

Theorem

There is no largest prime number.

Proof.

- 1 Suppose p were the largest prime number.
- 2 Let $q := 1 + \prod_{i=1}^p i = 1 + p!$.
- 3 Then q is not divisible by any $p' \in \{1, \dots, p\}$.
- 4 Thus $q > p$ is also prime. □