

# There Is No Largest Prime Number

## With an introduction to a new proof technique

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# Outline

## 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.

