

There Is No Largest Prime Number



Católica de
Santa Catarina
Centro Universitário

Euclid of Alexandria euclid@alexandria.edu

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Theorem

There is no largest prime number.

- 1 Suppose p were the largest prime number.
- 2
- 3
- 4 But $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers.

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The proof uses *reductio ad absurdum*.

Theorem

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- 1 Suppose p were the largest prime number.
- 2 Let q be the product of the first p numbers.
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- 4 But $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers.

Theorem

There is no largest prime number.

- 1 Suppose p were the largest prime number.
- 2 Let q be the product of the first p numbers.
- 3 Then $q + 1$ is not divisible by any of them.
- 4 But $q + 1$ is greater than 1, thus divisible by some prime number not in the first p numbers.

- one
- two

