



# There Is No Largest Prime Number

Euclid of Alexandria

27th International Symposium of Prime Numbers



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The proof uses reductio ad absurdum.

## 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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- 2 Let  $q$  be the product of the first  $p$  numbers.
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*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.

# A longer title

There Is No Largest Prime Number

- one
- two