## Least greatest proofs

For a set of numbers X, how do you formalize "there is a greatest X" or "there is a least X"?

**Prove** or **disprove**: There is a least prime number.

**Prove** or **disprove**: There is a greatest integer.

Approach 1, De Morgan's and universal generalization:

Approach 2, proof by contradiction:

*Extra examples*: Prove or disprove that  $\mathbb{N}$ ,  $\mathbb{Q}$  each have a least and a greatest element.

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