Proof that there is no largest integer

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Let the domain be the set of integers.

Assume there is a largest integer.

"There is a largest integer" can be rewritten as:

$\exists x \forall y (x > y)$

Consider the case where $y = x + 1$.

This leads to the statement $(x > x + 1)$, which is a contradiction.

Therefore, there does not exist an integer x such that for all integers y, $x > y$.

Q.E.D.