

## **Greatest Lower Bounds**

## Why

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## Definition

Let  $(A, \leq)$  be a chain.

A lower bound for  $B \subset A$  is an element  $a \in A$  so that  $a \leq b$  for all  $b \in B$ . A set is bounded from below if it has a least upper bound. A greatest lower bound for B is an element  $c \in A$  so that c is a lower bound and c < a for all other lower bounds a.

**Proposition 1.** If there is a greatest lower bound it is unique.<sup>2</sup>

We call the unique greatest lower bound of a set (if it exists) the *infimum*.

## Notation

We denote the infimum of a set  $B \subset A$  by inf A.

 $<sup>^{1}</sup>$ To be given in future editions.

<sup>&</sup>lt;sup>2</sup>Proof in future editions.

