

**Remark 3.i.3.** [07S] (Solved on 2023-01-17) Recall that the supremum  $\sup A$  of  $A \subseteq X$  is (by definition) the minimum of the majorants (when it exists). If  $X$  is well ordered we have the existence of the supremum  $\sup A$  for any  $A \subseteq X$  that is upper bounded.<sup>a</sup> (If  $A$  is not upper bounded, we can conventionally decide that  $\sup A = \infty$ ).

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<sup>a</sup>“Upper bounded” means that there exists  $w \in X$  such that  $x \leq w$  for every  $x \in A$ . This is equivalent to saying that the set of majorants of  $A$  is not empty!