

First Practice Test Addendum

Here is the definition you need for problem 5 on the first practice test:

Definition. Let $f : A \rightarrow \mathbb{R}$ be a function. Then f is *bounded above* if there exists $k \in \mathbb{R}$ with $f(x) \leq k$ for all $x \in A$. Any such k is an *upper bound* for f . If there is an upper bound k such that $k' \geq k$ for all upper bounds k' , then k is the *least upper bound* (or the *supremum*) for f , denoted by $k = \sup_{x \in A} f(x)$.

You can also use the fact that $\sup_{x \in A} f(x) = \sup f(A)$. I.e., instead of considering the function itself, consider the range $f(A)$ as a set. Also, the notation $(fg)(x)$ denotes the pointwise product $f(x)g(x)$.