

Explorations and Activities

Before stating this homework, review the [Symbolically Write Guidelines](#), which is also posted on the course homework page. It will answer many of the questions you might otherwise have.

▷. Definition 14 will be presented and explored further in Math 554.

Definition 14. Let A be a subset of the real numbers. A number $b \in \mathbb{R}$ is called an upper bound for the set A provided that for each element $x \in A$, we have $x \leq b$.

►. Using Definition 14, complete the parts of this exercise.

HINT. In part 1 and 2, when asked to symbolically complete a sentence, your answer should look like $(\forall x \in U)[P(x)]$ or $(\exists x \in U)[P(x)]$ for some properly chosen universe U (e.g., \mathbb{R} , A) and some open sentence $P(x)$, which should contain the variable x and might contain the: number b , set A .

1. Symbolically complete the following sentence.

Let $A \subseteq \mathbb{R}$. A number b is called an upper bound for the set A provided that ...

2. Symbolically complete the following sentence.

Let $A \subseteq \mathbb{R}$. A number b is not an upper bound for the set A provided that ...

3. Without using the quantifier symbols, complete the following sentence in English. You can use math symbols similar to those in Definition 14.

Let $A \subseteq \mathbb{R}$. A number b is not an upper bound for the set A provided that ...

.....

DELETE this whole sentence and THEN put your answer to ALL parts down here.