

How to do a problem set outline Math 131B

This handout is meant to give a better idea of what a problem set outline is.

Definitions. Here you should list the definitions from Sections 2.1–2.4. **Exception:** Please skip Defn. 2.1.2 except for the paragraph that begins “To give a bit more detail about (OC)...,” which has a lot of very important definitions having to do with upper and lower bounds.

Problem plans. Here is the problem plan for PS01 problem 2, where you have to prove:

Suppose S and T are nonempty bounded subsets of \mathbb{R} such that for every $s \in S$ and $t \in T$, we have that $s \leq t$.

- (a) Prove that if $t \in T$, then $t \geq \sup S$.
- (b) Prove that $\sup S \leq \inf T$.

The outline for this problem goes something like this:

- A.** S and T are nonempty bounded subsets of \mathbb{R} .
- A.** For every $s \in S$ and $t \in T$, we have that $s \leq t$.

(a) **A.** $t \in T$.

C. $t \geq \sup S$.

C. If $t \in T$, then $t \geq \sup S$.

(b) (all of the above assumed)

C. $\sup S \leq \inf T$.

Here, **A.** means “Assume:” and **C.** means “Conclude:”.

For more about the idea of proving if-then statements using this assume/conclude method, see the handout about methods of proof.