

Math 387, Spring 2025, Class Notes

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We did administrative stuff then read problems 1-7 in the Bogart book.

I'm going to write out my official definition of what a function is. We will talk about motivation for this later.

Let S and T be sets.

We say that R is a relation from S to T iff R is a triple (S, T, G) , where $G \subseteq S \times T$. G is called the graph of R , and we say that $x R y$ is true iff $(x, y) \in G$.

We say that f is a function from S to T (written $f : S \rightarrow T$) just in case f is a relation (S, T, G) from S to T and for each $x \in S$ there is exactly one y in T such that $(x, y) \in G$. We define $f(x)$, for each $x \in S$, as the unique y such that $(x, y) \in G$.

An alternative approach is to identify relations and functions with their graphs (so they are just subsets of $S \times T$), but this requires care in expression which most undergraduate textbooks don't bother with. We will discuss in detail what the problems are with the approach the book takes.