9.3.3 Operations with Sets

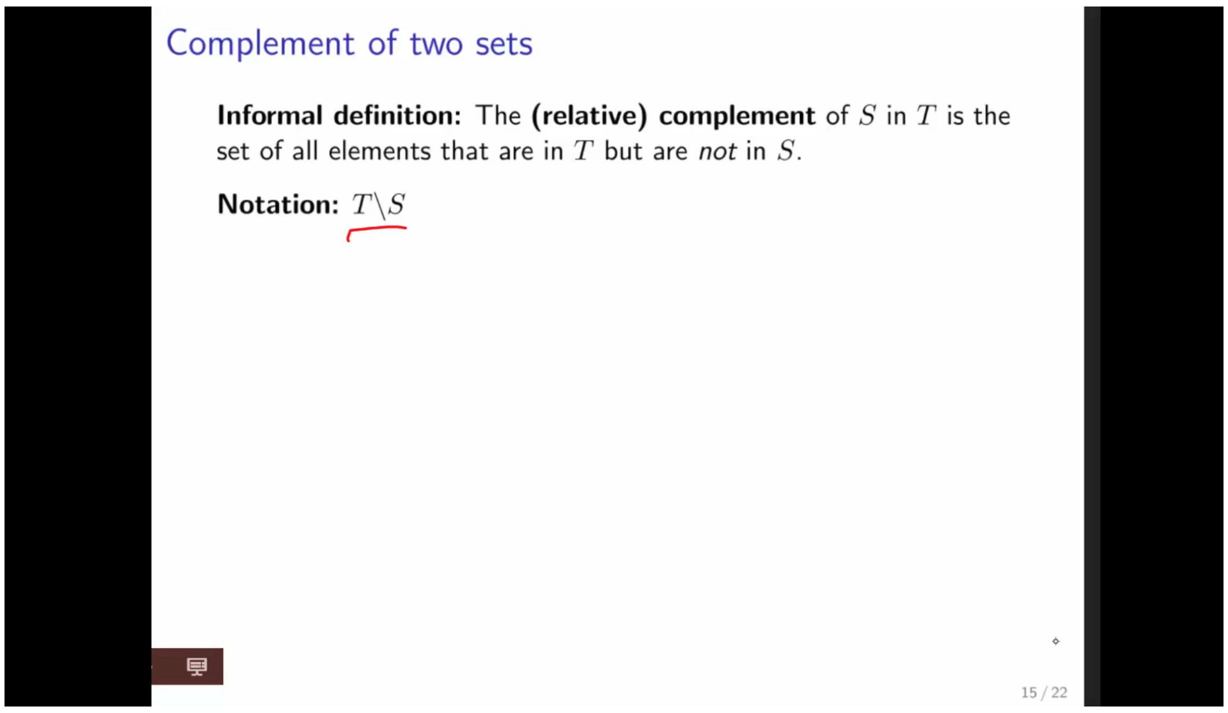
Week 9 due Dec 9, 2023 18:12 IST Completed

9.3.3 Operations with Sets

Note

In at least one place $S \backslash T$ should be $T \backslash S$ (the complement of S relative to T).

Video



1:58 / 3:22 2.0x

then it's all the elements that are in both that are denoted by S intersection

T. And in our example, we see that the elements 2, 3 are in both sets,

and therefore, the intersection of S and T is given by the elements 2 and 3.

Now we get to the complement of two sets.

And here, what they're saying is, look, we have a set T and a set S.

And what we want is we want all of the elements that are in T but not in S.

It's denoted by this backslash.

And sometimes-- let's see, this is wrong.

This should be S bar.

It's like that.

And that's done if it's understood what set T we're talking about.

And sometimes, we'll talk about S complement like that.

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Reading Assignment

0 points possible (ungraded)
Read Unit 9.3.3 of the notes. [LINK to Week9.pdf]

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? Duplicates within sets
How are duplicates treated for set operations, for example would {1, 2, 2, 3} intersection {2, 2, 5} be {2, 2} or just {2} (Does this differ for union? ... 2

? Question
Hi, I am wondering what's the order of set operations. For example, in Homework 9.3.3.1, ∪ is operated before ⊂? 4

Question on Homework 9.3.3.1
Greetings! I did not quite follow your solution to Homework 9.3.3.1. What does P ⇒ P V R mean? Why it helps to bridge [x belongs to S] with [x b... 3

Homework 9.3.3.1

10.0/10.0 points (graded)
Let S and T be two sets. Then $S \subset S \cup T$.

Always ✔ Answer: Always

When proving that one set is a subset of another set, you start by saying "Let $x \in S$" by which you mean "Let x be an arbitrary element in S". You then proceed to show that this arbitrary element is also an element of the other set.

Let $x \in S$. We will prove that $x \in S \cup T$.

$x \in S$
$\quad \Rightarrow \quad < P \Rightarrow P \vee R >$
$x \in S \vee x \in T$
$\quad \Rightarrow \quad < x \in S \cup T \Leftrightarrow x \in S \vee x \in T >$
$x \in S \cup T$

Hence $S \subset S \cup T$.

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Answers are displayed within the problem

Homework 9.3.3.2

1/1 point (graded)
Let S and T be two sets. Then $S \cap T \subset S$.

Always ✔ Answer: Always

Let $x \in S \cap T$. We will prove that $x \in S$.

$x \in S \cap T$
$\quad \Rightarrow \quad < x \in S \cap T \Leftrightarrow x \in S \wedge x \in T >$
$x \in S \wedge x \in T$
$\quad \Rightarrow \quad < P \wedge R \Rightarrow P >$
$x \in S$

Hence $S \cap T \subset S$.

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Answers are displayed within the problem

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