

CP-module1_lecture8_editedShayon

Mon, 12/27 2:44PM 6:14

SUMMARY KEYWORDS

union, include, draw, means, lecture, equal, inclusive, notation, write, bowl, technical definition, dots, set, definition, equal sign, defined, combine, ends, elements, combination

SPEAKERS

Catherine Pfaff

Welcome. In this lecture, I want to talk about how we can combine sets. So these are unions. And I've already written this setup for us, because we're going to use this in more than one lecture. So the setup is that I'm going to have two sets. So I'm going to have a set A and set B. And in our favorite example, we're going to have that A is going to equal the set which contains the elements 1, 2, and 3, and then B is going to be the set that contains the elements 3, 4, and 5. Okay? So to get started, what is the union of A and B? Okay, so we have that A union B, so this is kind of formally, we have A union B, so this is our notation. And that's actually kind of how to be consistent with that over there. So I'm going to have A, and then union it, and then I'm going to do this with B. Okay, so this is our notation, I'm going to box it in red. Okay. So this, what does this mean? This is notation and what this means, so this is the union is the word, so this is the union of A and B.

Okay, so the union of A and B. Okay, so what is the technical definition of this? So, the technical definition. I'll write Dfn for definition a lot. Okay, so the technical definition is that I'm going to take A when I write A union B, so this and we're boxing it in red, this is like the definition of what this is. So this is defined to equal. So this is what it means when I write kind of a colon, and then an equal sign after that. That means I'm saying this is defined to equal so I'm giving you the definition of it, it's going to be a particular set. So what is the set? It's a set of all X, such that either X is in A or X is in B, this is an inclusive or so it can be in both, that's totally okay. So we either have that X is in A or X is in B. So for those who like logic or things like this, or is a logic word, but this is an inclusive or. Okay, so let's kind of look at what that actually means. Okay, so what is it? Um, it's a combination of A and B. So it's the combination of A and B.

Okay, so let's kind of draw this. So if I had here, I have my A here, and I have. Some people like these Venn diagrams, so it's good to use them. It's going to give you more than one way. And then we have our B here. Well, we have to include everything, that's in A, okay, so the everything that's in A ends up in the union. We also have to include it's also okay if it's in B. So it's also in the union. Okay, and it's okay that those are in both. Okay, so what I've drawn there, right, so this is A union B. It only had to be in one of those and then we're good. Okay, so let's look in the example.

Okay, let's actually kind of draw these on the number line, that can kind of help. So let's go ahead and say okay, so what do we have, we have, I'm going to put all these numbers on here first, so we have 1 through 5. So let's go ahead and kind of mark those on here. So we have 1, 2, 3, 4, 5. Okay, so we're looking at things that are included in so, A here is sitting as 1, 2, 3, and then B is going to be 3, 4, oops, this is going to be 3, 4, and 5. Okay, so we together we get this entire set. So everything that's got a circle next to it, it's okay if it has two, it's going to be included in this set. So in this circumstance, we have $A \cup B$ is going to equal, so I include 1 and 2 and 3 and 4 and 5.

And that's my final answer. Okay, so, in this lecture, we talked about how you kind of combine sets together. And the symbol for that is a U for union, okay? This is kind of like the formal definition of it, but really, you're just including everything that's an A, and you're including everything that's in B. I kind of think of it as you just kind of dump all them into the same bowl, and anything that ends up in the bowl is in the union. And so in this particular example, I just kind of drew dots for the set A and for the set B, and then anything that had a dot, even if it had two dots, is included, okay. So I hope that made some sense, and I'll see you in the next lecture.