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SUMMARY KEYWORDS

integer, interval, included, inequality, integer values, satisfying, inclusive, endpoints, equal, break, side, write, other side, solidly, finite, line, talk, lecture, number, enter

SPEAKERS

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Welcome. In this lecture, this will be the first of two, where I'm going to kind of talk about inequalities and finite sets to kind of get you used to actually understanding how inequalities work at the same time as kind of understanding how sets work, and looking at the number line and the integers and things like this. So here's kind of the question of this lesson, which is, so question is, can we write, and we want to look at a particular set. So this is the set. So we want to write the set of all, and then I want to write X in the integer. So we're only looking at X that are integers. And then remember that this is kind of like saying satisfying. And then on this side, we want to say that our inequality is going to be 4.5, is going to be less than or equal to X is going to be less than seven. And the question is going to be, can we write this more simply? Okay, so let's kind of break down what does this kind of mean here, so this is, right, so we're looking at integers X .

And then this part here says that we're looking at satisfying, and then this inequality here, so this is going to be 4.5 is less than or equal to X is less than seven. Okay, so we're looking for all integers X that satisfy this. Great. So the answer, I'll just give you the answer, and then I'll kind of break down how I got it. So here's the answer. So the answer is just going to be five and six. So how did we get that? The first thing to kind of look at is, what does this look like on the number line, and I'm going to go ahead and draw that for you. So let's kind of draw the number line here. And I have, so what's happening on this side is there's, this is a less than or equal to. So on that side, that's actually going to be right, because it's less than or equal to this is inclusive. So where I write 4.5 here, I'm going to actually fill this in. And then on the other side, I have less than seven. So when it says just less than that means it's not inclusive, I do not include seven, okay. And then we're looking at everything in between here. Right. So if I actually had the in, you know, right, the other thing to kind of keep in mind is I'm only looking at integer values, right? So let's actually kind of put these, the integers that are in this range kind of on here. So I have five would say here, six would sit here seven to actually enter, enter. So I'm going to kind of like, give it a second color. Okay, guys, two colors. Eight is here. Four is here. Okay. So we're kind of looking for integer values in that interval, you can almost kind of see it there. But let's kind of break down what we did. So here we go breaking it down.

So the first observation is because right, we know for sure that five and six are included. Okay? They're both integers, they're between the two endpoints very solidly. So those are definitely

included. Okay, so five and six are solidly right between the endpoints. Right, and they're integers. So definitely included. Okay, so five and six included. So let's just kind of five and six. Now we need to worry about the other numbers. The other two things to kind of check are the left and the right endpoints. Okay. So 4.5 is included but it's not an integer, so it's out. So 4.5 is in the interval but not an integer, and this is kind of the key point. So it's out. Okay, so because, right, so not an integer told me it was out. Okay, so now let's look at the other end point, in the other side we have seven. Okay. But seven is an integer, but it's not in the interval. Right? And that's kind of the key point. So it's still out. Okay? So in this case, the issue is actually, so not being in the interval is what told me it's out. Okay, so in the first case, so the key point here is that, right, so everything that's in between is definitely included. And then when I'm looking at the two endpoints, which I need to look at, they have to be both in the interval and an integer. And if they fail either of those two, then they're out, okay. And 4.5 was in the interval, but not an integer. Seven was not in, even though it was an integer, it was not in the interval. So that one was out. Okay? So I hope that made some sense, and I'll see you in the next lecture.