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SUMMARY KEYWORDS

orangeville, graph, notation, input, change, function, equation, corresponded, $3x$, distance, interchanged, equals, output, coordinate, represented, write, track, point, slight difference, circumstance

SPEAKERS

Catherine Pfaff

Welcome. In this lecture, I want to kind of revisit the example from before to show what happens or how you change sometimes an equation to a function, and then maybe even decide to change the variables to make them maybe a little bit more evocative of what they're representing, and how that changes the graph and so on, okay. So in the example, we represented our situation, so in the example, we represented our situation. So we represented the situation with and we had, so we had Y equals $3X$ minus 1. So, so this was like a Y equals $3X$ minus 1, where we had in particular, we had that we had that X , right, was going to represent the time input. So this is the time input or the time passed. Right, the time that's passed. Okay, and then our Y value is the distance past Orangeville. This is kind of what we had to remind you. Okay, now we can write that as a function, right, so that's the first part is to write that as a function, so we can write this as a function, right, where we have F of X equals $3X$ minus 1, right, and here we have, so this X is going to be the time input, just like over there. And then this is the distance past Orangeville. So this should look familiar from over there.

Right, you can see how that corresponds over here, right? Input X is the time input, and it's still there. What's kind of changed from here was we had a Y here, now it's an F of X , but that's going to give the out, as the output, the distance past Orangeville. Okay, um, so we often and then maybe we want to change the notation on this. So we often like to change the notation. Right? That kind of hints at the meaning, that's a little bit, so we often like notation hinting at the meaning. And so let's kind of do that in this circumstance. Where we're going to want to have, so we want to have that maybe T , so I'll still make this orange. So I still want that T , so this is kind of, and maybe I'll even write this corresponded to orange over there, and this corresponded to green over there. The inputs and the outputs. But let's change this to be time we often like T for time, right? Because this is the time input, or the time that's passed. And then we want to have so maybe, then this is actually kind of a function, where instead of it being F of X , now maybe D for distance, okay? But this is still equal to $3T$ minus 1. Right? I just replaced the X there with the T . Okay, so that's $3T$ minus 1. So this is the distance, so $3T$ minus 1, this would be the distance right? So the D was coming from this D here. So past Orangeville, right, and then this should be after.

And then with this input here, T hours went for T hours, how far past Orangeville would I be okay. Um,

so before we had this graph, right, so just kind of draw it over here. So this is the graph before if I was just seeing this as this equation, so I would have y and I would have X dropped an E on the end of before. And then I have this equation Y equals $3X$ minus 1 . Right, this was the equation from up here, Y equals $3X$ minus 1 , Y equals $3X$ minus 1 , okay, and then a point on here would look like, if I wanted to have a point on here, it would look like, it would look like X . And then Y , or in this circumstance, so this is going to equal X , and then $3Y$ minus 1 . Okay, but now the new graph. So this is the graph from before now the new graph.

It's gonna be over here. So this is, the graph from before is right here, the new graph, this is going to look exactly the same, with just a slight difference in labeling. So now this is going to be T . Now there is a question in here. So some people would write this as D , some would still write it as Y actually. So this could be D , or Y , kind of depends. It's a personal taste thing. And then now everything's like exactly the same. So we have this, the line, this ends up looking exactly the same. But you would say that this is the line of D of T equals $3T$ minus 1 , if I was like writing it as the graph. And then you would say, okay, well, what is the point here? Well, the point here is going to be now my input is T , and my output is going to be D of T . But if you look at that, what is that actually? It's exactly the same thing. It's actually T , and then $3T$ minus 1 , right? And so the key point here, so these should look exactly the same. So the only difference right, we could get between these by just interchanging X Y and T D , okay? So these are the exactly exactly the same.

Okay, so these are exactly the same. Except that we're going to have over there we have X , right, that gets interchanged with T , and Y gets interchanged with D . Okay, or D of T kind of depending on this. Okay, so what we kind of did is we translated things into a new language, alright. Like in the example, we were looking at this is that's the equation that represents that situation. Um, but there's several things we might want to do. So one is we may want to graph this, and then your output's your second coordinate your input's your first coordinate, or this is your X , and this is your Y . Oops that should be an X , $3X$ minus 1 , okay. And then over here, so the other thing that can happen is that sometimes you want to change what we call things, and particularly want to change into a function. So the first way of changing the function is to just replace Y with F of X . And then your inputs on that side, your outputs on that side, just kind of like over here. But you may also want to change your notation, we often like to have our notation kind of be, in order to make it easier to keep track of, we put like the first letter of words is our notation. It's just a very common way, but it helps us to keep track of what's going on as we're getting into equations and so on. So if we did a change like that, it's just a straightforward direct translation. And the picture is going to look exactly the same. But something to keep in mind because this is so this is something I'll often emphasize, because students often miss this. Once you've got the, this is a function. This is the graph of a function. That your second coordinate, how do you get your second coordinate? You stick your first coordinates into the function to get your second coordinate. So that's something important to keep track of as you're going through different examples. Okay, so I hope that made some sense, and I'll see you in the next lecture.