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SUMMARY KEYWORDS

graph, equal, $3x$, linear function, coordinate, function, stick, called, parentheses, input, variable x , output, linear, pt, tricky, bit, correspond, wanted, abbreviate, particular circumstance

SPEAKERS

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Welcome, in this lecture, I'm going to go through how these graphs of, right, when you have like a line, that this is actually the graph of a function that's particularly called a linear function. But let's just kind of get started with this. So we call the line, so recall the line where you have, so we have an X axis and a Y axis. So I have an X axis like this, and then I have a Y axis like, this, little bit crooked that's okay. And then I have the graph of some function. So I have this graph, which is, or actually, so it's a graph of a line, right, with an equation like this. Okay. So then the key point is that this line, so this line, this line here, okay, is also the graph. So it's also the graph of the function. So it's also the graph of the function that looks like F of X equals $3X$ minus 1.

Okay, where we have, so where we have here that, so when we have that X is the input. And actually, we can make these orange to correspond with what's going on there. Okay, so when X is the input, so when X is the input, we're actually going to have that Y is the function output, is the function output, which is F of X . So, right, so then we could ask ourselves, so what is the point look like? So and then I'll just kind of actually draw it over there. So what does a point look like? So what does a point look like? I don't know if I've told you, but it's always good to tell people things more than once. We often like to abbreviate this PT. So it's good to know that that's an abbreviation for point. But let's go ahead and look at a point here. So if I take a point on this graph, so, and I know that the first coordinate is X , okay, right, that comes from here, this is X , then the second coordinate is actually F of X . So I'm going to plug X into F , right, that's like this, which is actually equal to, right, so what is this equal to? Well, I know that this function F of X , I can take this here to tell me it's $3X$ minus 1. So what I actually have is a X , and then I have, right, just looking there, I'm going to have $3X$ minus 1.

So every point kind of looks like this, right? And this is telling me the height here. So this here would be my F of X , right, which is the same thing as $3X$ minus 1 right? So this is equal to $3X$ minus 1. Right? So, if my, right, my horizontal point is X , then the corresponding vertical is F of X , which in this particular circumstance is $3X$ minus 1. Okay. So now let's look at a particular point on here. So let's say I chose minus 2. Okay, and then I wanted to look at the point that I would get there. Why don't we use red here? We haven't used red yet. I'll just have this point here. Okay, well, in figuring this out, what do I have to do? So I know that my first coordinate is minus 2. Right? And then how do I figure out my second coordinate? Well, I have to stick this into F , right, just like up there. I told myself, I was

going to have to do something to stick that into here. So I'm gonna get F of minus 2. But I know the equation, right, so we go through the next step. And we say, okay, well, this is equal to the first coordinate is definitely minus 2. But then the second coordinate, I have to stick into here, so I have 3, and then I have a variable. So let's just kind of leave that with parentheses minus 1. And then I'm going to stick in that minus 2. So this is actually going to equal, so I have my minus 2 from there. And then let's kind of work this out. So minus 2 times 3 is minus 6, I subtract a 1, so that's minus 6 minus 1, so that's actually minus 7.

Okay, so that's gonna give me that this value here. So that's a little bit tricky. It kind of overlapped here, so it's gonna be a little tricky to see. Right? But this here is minus 7. Okay. Great. Now, I wanted to make a remark, which was that, so, here we go, which is that this is called a linear function. So this function F of X . So this function F of X is a linear function. It's a linear function, linear like with line. Okay, um, since it has the form, since has the form where we have, right, it looks like F of X is going to equal, so we have F of X equals $A X$ plus B . Just kind of put those X 's there. So $A X$ plus B . So like slope and intercept, okay? And then this is like linear. So why do we call this linear? So linear, right, because it looks like a line. Because its graph looks like the line. So because its graph looks like the line well, you know, just like with here, it's going to be Y equals $A X$ plus B . Okay? So Y equals $A X$ plus B . So that you can kind of see how those correspond so you could be like, how is this different, it's not really different, it's just that Y is telling you the output, and we're thinking of it as actually the graph of a function. Okay. So to kind of recap what we had here, when you start out with the graph of like, the graph of a line like this, this can actually be the graph of a function where your input's the first coordinate, and your output's the second coordinate. So if you wanted to figure out your second coordinate, you would just stick your first coordinates into the function, right, just like we did here with F of X into $3X$ minus 1, we did this specifically with minus 2, right? And when we stuck that into F of minus 2, that was the same thing, right? We stuck it into F . So that was the same thing as 3 times minus 2 minus 1. Okay, I just replaced the variable X here with parentheses, and then I stuck my minus 2 inside, okay, and I got minus 2 minus 7. So minus 2 is my first coordinate, so it tells me this one. Minus 7 is my second coordinate, so it tells me this one for that particular point, okay. And then this, this function that you would get is called a linear function, which is not too surprising, because its graph is a line. So, I hope that made some sense and I will see you in the next lecture.