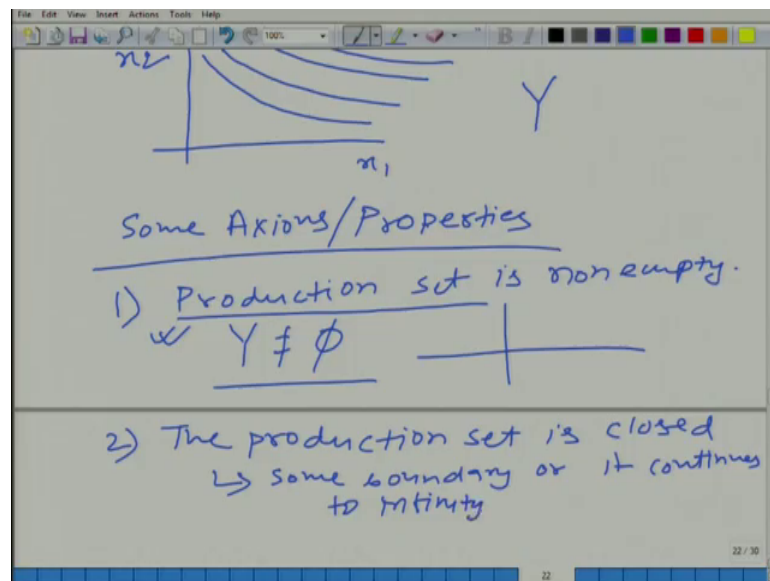**An Introduction to Microeconomics**
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Lecture – 75
Few Axioms Related to Technology

Now, let us talk about some of the axioms that technology typically satisfies ok.

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Some axioms or properties, you must have noticed by now that in economics we have tendency to convert everything into mathematical, notation mathematical symbol it is not necessary it is not compulsory. But the thing is that when you convert it if the things in the language of mathematics the life becomes easier.

You know you can you have mathematical formulation and all you have rules and logic that you can use from mathematics to solve the problem and after obtaining the mathematical solution you can revert it back in the economic setting obtain the economic solution also ok. So, that is the typical process.

So, the first is the production set is non empty, what does it mean?

Student: We can produce; we cannot produce anything or nothing.

No, that it does not mean.

Student: If we are putting into.

By the way production set is typically denoted by capital Y, this is typical way to denote. So, Y is not equal to.

Student: 0 phi.

0 y is not equal to phi.

Student: Phi

What it means is that whenever we talk about production set, something can be produced. We are not talking about a scenario when nothing can be produced and if you think of a in a life of course, there are various things that cannot be produced, then we can we will not talk about it, what is point of talking about it.

So, here simply this is a mathematical requirement that we have mostly we will talk about mathematical requirement. Here, it means that this is not empty there is no you know the no combination, that is not possible whenever we talk about production set its non empty fine. The second is the production set is closed, what it means is that production set has some boundary.

Student: (Refer Time: 02:50).

Some boundary or it or some boundary or it continues to infinity, then you do not need the boundary.

Student: Sir, closed in sense fixed boundary is not.

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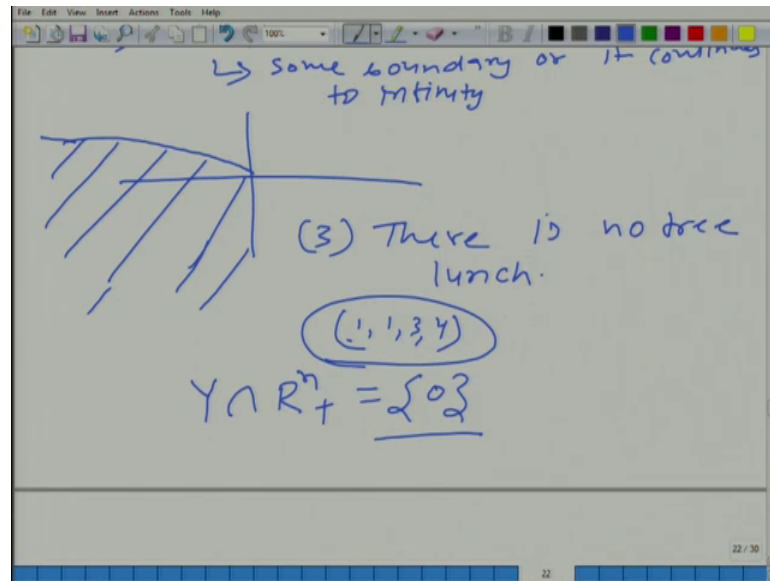
No, for example, this is closed this is the production set. So, it is bounded here, it has boundary here, but there is no boundary on in this side this is also a closed.

Student: [FL] we can close it on 1 side like.

Student: Mathematically.

So, and this is again mathematical requirement because we will talk about maximization and all. So, this is a mathematical requirement [FL], third what you were talking about is that there is the word that we use you will hear it from economist again and again that there is no free lunch. The rule is called or a axiom is called, but there is no free lunch, what it means is that if you take an element of this production set you cannot have only positive numbers, you cannot have an element like this in the production set.

What does it mean? That everything is output here, nothing is being used to produce this output. So, that is not possible, at least 1 would have 1 should have a negative sign. So, basically what we are saying nothing can be produced from thin here you cannot conjure something, Harry Potter system would not work that is what basically we are talking about, that we are ruling out ok, it is not possible ok. In other word what we are saying is that this is the production set and if we take the intersection with the positive r th n at max we can get only 0 is it clear fine ok.

Student: 0

See we can ignore all these axioms and still we can learn about production theory and that is the typical way to go about it, but what we are doing we are learning the basic we are not assuming things out because when we do the maximization, profit maximization.

To do the profit maximization some properties have to be satisfied and these are the properties required to do the profit maximization, that is why we are learning about it in very brief not in detail ok.

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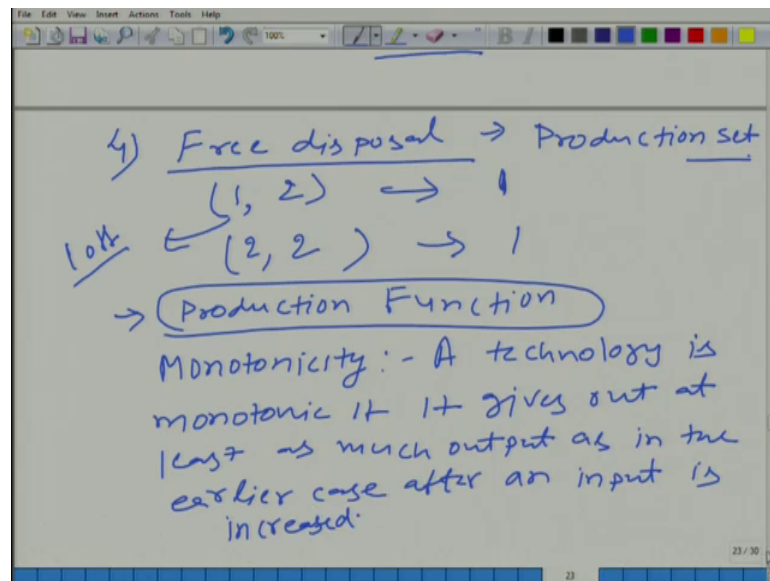
Then free disposal, what is free disposal? Means if you have let us say a production process just for example, when we have 1 output and 2 inputs, let us say 1 comma 2 is leading to 1 unit of output.

So, at 1 unit of output can still be produced by 2 comma 2 because what we are doing we are freely we are disposing 1 off, 1 unit of good one off what we are assuming basically that disposal is cost free.

There is no cost in disposing off some of the inputs, but let me tell you in real life this gets violated.

Sometime it is costly to throw something out not in the emotional sense, but in the real sense you have to pay someone, like if you just disposal is not free ok. So, in that sense, but it is an assumption that we typically make and free disposal of course, here I have talked in the context of production set fine. Here we have talked in the concept in the

context of production set, if we take the same concept in the production function what do we get, assume a property that we have learned earlier in context of consumption set, monotonicity.

Let me show you how, what it means is let me define it a technology is, a technology is monotonic if it gives out at least as much output as in the earlier case after an input is, an input is increased fine.

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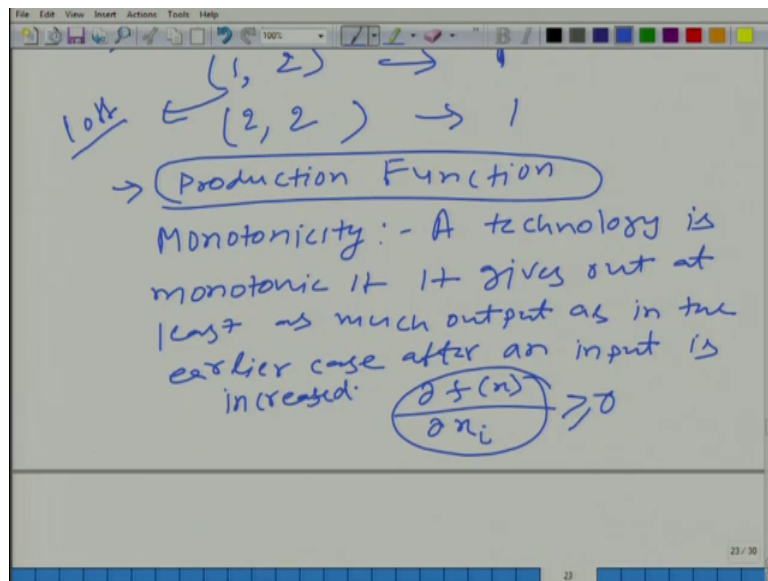
In mathematical notation the partial derivative of output with respect to one input should be greater than or equal to 0.

Student: 0.

Isn't it related to free disposal, not exactly the same, but related this free disposal ensure that at worst this is going to be equal to.

Student: 0.

0 fine ok.