An Introduction to Microeconomics
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Lecture - 60
Perfect Substitutes

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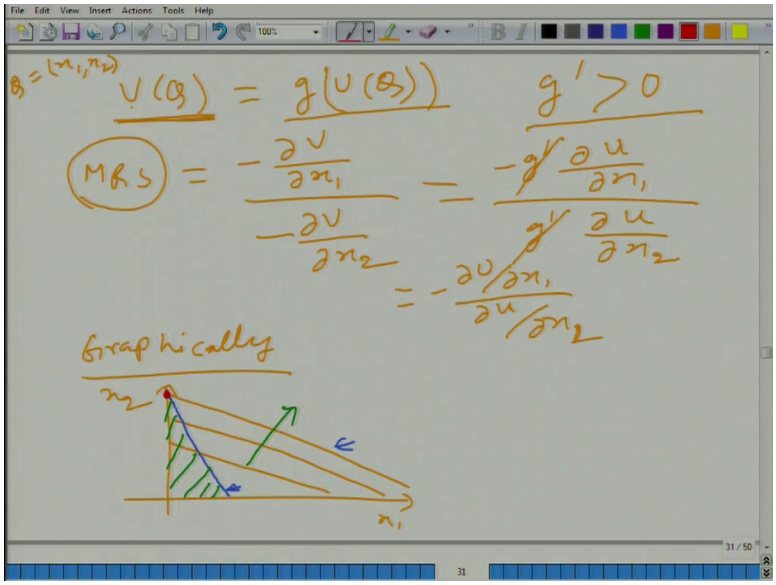

Now, let us solve this problem graphically, now you will not get confused between why do we use, now you will see that we never talk about marginal utility, we always talk about marginal rate of substitution because marginal rate of substitution preserves the it does not depend on the, it does not vary with monotonic transformation of utility and that is that is important to us fine.

So, graphically what we have is of course, here we have good one here we have good 2, now this is like this and budget line is like this of course, here I am assuming slope is 1, here I am taking slope is minus half. So, budget line is steeper than an individual indifference curve ok, because the slope of indifference curve is minus half at all the points and slope of this budget line is minus 1. So, this is steeper.

So, of course, and what is the in this direction if you look at in this direction utility is increasing ok. So, what is the idea here that the person would try to reach to the highest possible indifference level given the budget constraint. So, the budget constraint all these

bundles are feasible. So, which bundle this person would choose the bundle that is right here, this person will consume only good 2, only good 1.

Now, let me change this problem little bit just to understand how it works.

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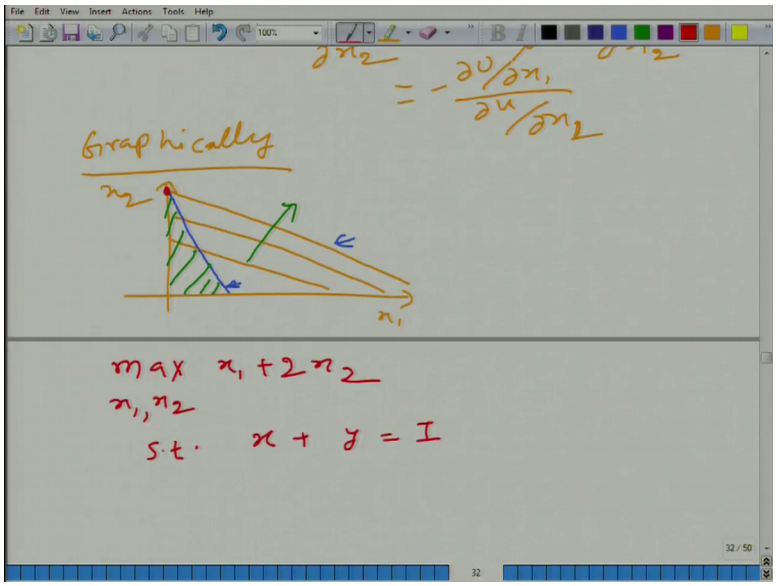

Again we are talking about maximising x 1 plus 2 x 2 of course, maximise with respect to x 1 and x 2.

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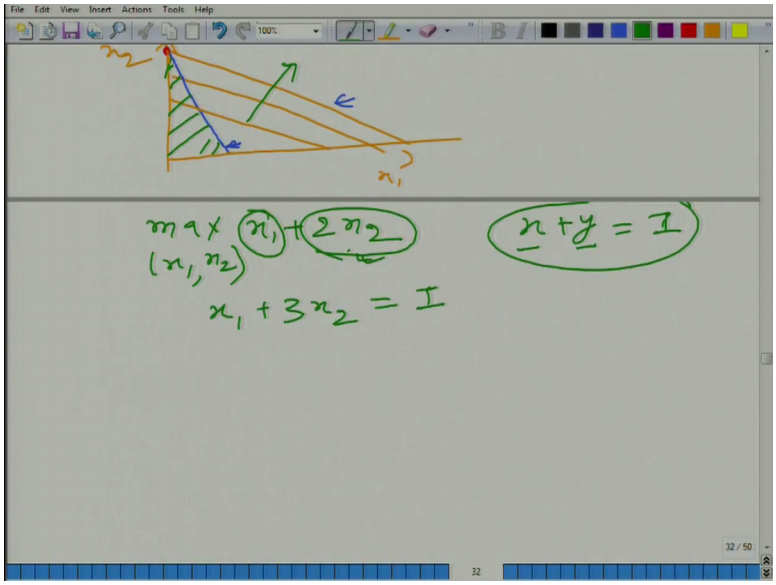

Such that earlier our problem had x plus y is equal to I, now let say what we have is with respect to x 1 and x 2, but now we are going to change the budget constraint, what we have earlier is x plus y. So, in the market x plus y is equal to I, in the market 1 unit of good 1 can be exchanged for 1 unit of good 2 ok.

Now, let us change it to let us make good 2 more expensive ok, what we will have is that now good 2 cost at least thrice as much as good 1. So, what we will have here is the budget constraint is x 1 plus 3 x 2 is equal to I. So, earlier what was happening the market exchange rate by 1 is to 1, but this person valued 1 unit of good 2 more than 1 unit of good 1, remember here 1 unit of good 2 will give him 2 units of utility while 1 unit of good 1 will give him only 1 unit of utility.

So, he valued 1 unit of good 2 more than 1 unit of good 1 while the market valuation was same for both the good, both the good would cost 1 rupee each. So, that is why what he will do since he values in the absolute term he values 1 unit of good 2 more than 1 unit of good 1. So, he will keep on consuming only good 2.

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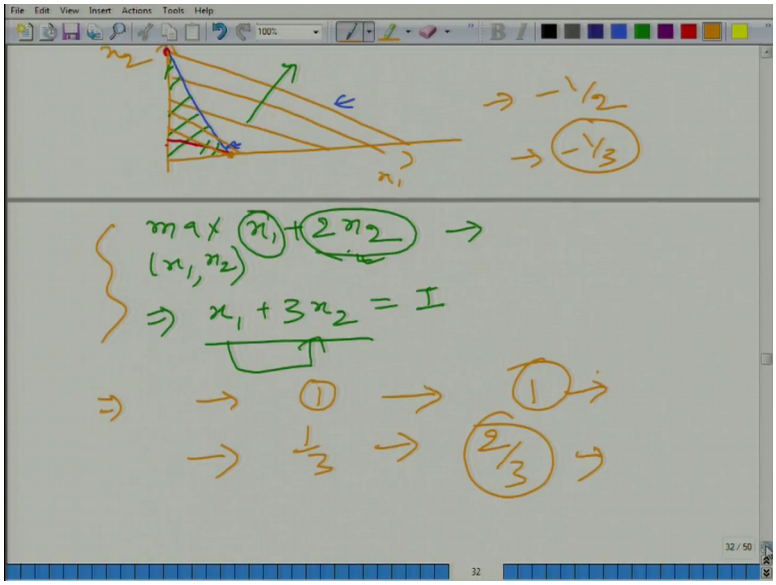

Now, what is happening here forget about this budget constraint. What is happening here is that the value of 1 unit of good 2 is twice as much as 1 unit of value of good 1 in terms of utility of course, the value here we are calculating in terms of utility ok. So, it is twice as much, but what is if you look at the market the market valuation of good 2 is thrice as much when I say market valuation I mean market price.

So, the value you get from 1 unit of good 2 is twice as much as 1 unit of good 1, but market valuation is thrice as much. So, of course, in this individuals opinion good 2 is expensive then good 1. So, of course, he will consume only good 1 and let us look at the this graph what is happening here in this case is the indifference curves would remain the same it would not change, but the budget line will change and how will the budget line change in the new budget line the maximum amount of x 1 that a person can consume was this much gain by red dot this would remain same, but what would happen x 2 will come down ok, it will come down this is the way it will come down ok.

So, now let is see if I draw more indifference curve of course, the slope of indifference curve is minus half, while the slope of the budget line is minus 1 by 3. So, of course, now indifference curve here is steeper. So, now, the optimal bundle lies here, this person will consume only x 1 none of x 2. So, what it means again this gives us a very good idea to look at this problem in a little different way that 1 rupee lets think about 1 rupee that he is consuming ok, if 1 rupee spent on good 1 will get him certain utility certain amount of utility and 1 rupee if he spends on good to will also give him some different amount of utility and of course, he would compare these 2.

So, how much let us let us say the utility increase in utility if he consumes 1 rupee on good 1 is going to be 1 no because if he spends 1 rupee on good 1, how many units of good 1 he can buy 1 fine and how much will be the increase in utility 1, if he take this problem and if he spends 1 rupee on good 2 how much he can buy of good 2, 1 by 3 and how much is going to be the increase in utility 2 by 3.

So, what it says that whenever given this scenario whenever you spend 1 rupees, whenever you spend 1 rupee on good 1 you get utility 1 and let say you cannot say it depends on the utility does depend on utility this particular value, but if you take monotonic transformation of these 2 values this will always be more than this, that is important ok. So, does not matter which representation of utility function which particular representation you take the, it will be rank in this particular fashion. So, here it is good idea to spend all the income on good 1 fine.

Let us look at the earlier problem ok.

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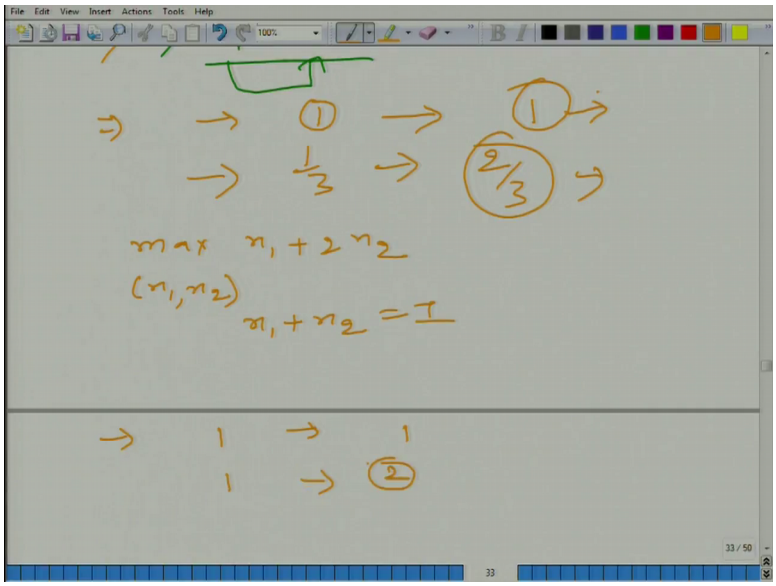

The earlier problem was using this technique x 1 plus 2 x 2 and what we had was x 1 plus x 2 is equal to I fine. Now, let us see that if he spends 1 rupee on good 1 how many units of good you can buy, 1 and how much will be increase in the utility 1 and if he spends 1 rupee on good 2, how many more units of good 2 he can buy 1 and what will be increase in utility 2. So, of course, 2 is more than 1.

So, rather than talking using numerical value let us say if we have a problem where what we do is maximise u of x 1 x 2 with respect to x 1 comma x 2.

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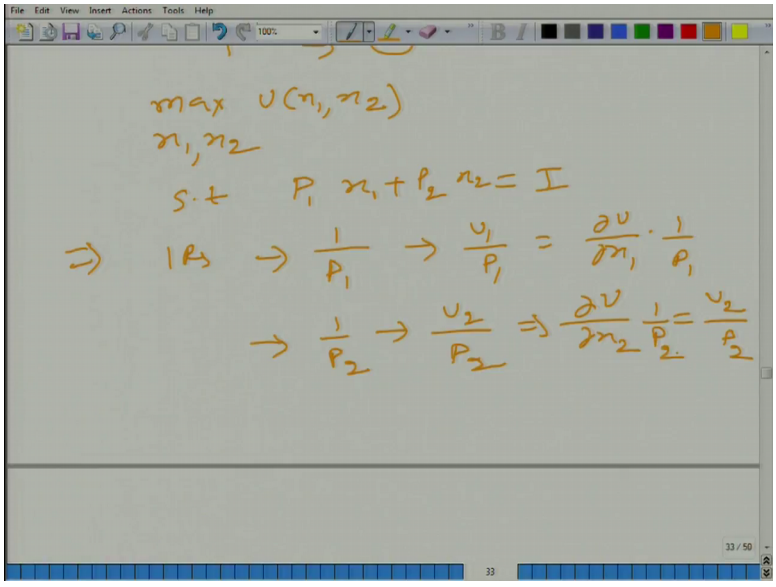

Such that what we have is p x x plus p y y and this is equal to I ok, I use this technique yesterday also, but there we talked about a scenario where we get interior solution where x 1 and x 2 both are greater than 0. Now, we are talking about a scenario where we have at least 1 of these goods optimal amount of consumption of 1 of these goods is equal to 0 and of course, this scenario is known as corner solution ok.

Why we say said corner solution if you look at the diagram it would be clear either you get solution in 1 corner or in the other fine ok. So, what is happening here, now let say if you have 1 rupee and if you spend it on good 1 how much will you get 1 by px and from 1 by px rate of change rate of increase in utility with respect to good 1 is. Of course, I have made a mistake here I have been writing here let me change the notation p 1, this is p 2 and this is x 2 and this is 1 by p 1 increase in utility is going to be u 1 by p 1, what is u 1 u 1 is this is basically dy by dx 1. So, rate of increase and what we have if we spend it on good 2 1 by p 2, u 2 by p 2 and its going to be or u 2 by p 2 this is 1 fine.

So, what happens when we have a solution where at optimal solution where 1 good is not consumed at all it means that the gain from spending even 1 rupee on that good let say that good is good 1.

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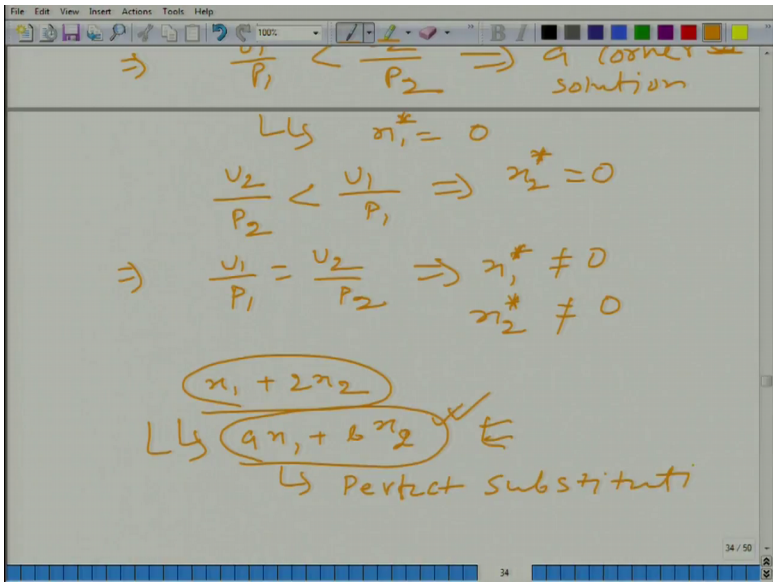

Then this has to be less than u 2 by p 2 then only you get a corner solution, in other word this will lead to x 1 is equal to this is true always then x 1 star is going to be equal to 0 and inversely if this is less than u 1 p 1 it will give us x 2 star is equal to 0.

So, if we can tie it to what we discussed earlier, what we discussed earlier that in the optimal case when x 1 star and x 2 star if both are not equal to 0, then what we need to have u 1 by p 1 should be equal to u 2 by p 2 in this case x 1 star x 2 star they both will not be equal to 0 and it make sense. If you are consuming both the goods then the gain this is gain from spending 1 rupee on good one and 1 rupee on good 2, they both should be equal. Otherwise you would not spend the last rupee on 1 of the goods which has lower you know return from the market, is it clear. So, we have developed another technique and these all are related.

Now, we have been using this particular utility function x 1 plus 2 x 2, this is the utility function we are using or let me write a more general 1 this is special example of a x 1 plus b x 2 ok, this utility function of course, this utility function is representing a particular kind of preference. So, we are talking about preference not just the utility function.

If we see preference of someone represented by this utility function what can we say about this person, we do not know that name.

Student: Means 1 group for another.

Student: Then we can substitute 1 group for another.

So, what it means is that he is always willing to exchange 1 good for the other good in fixed proportion, the proportion does not change and this particular kind of preference is called of course, this is linear in x 1 and x 2, this particular function is an exhibiting something called perfect substitution ok.

Now, let us what does it mean in words that basically consumer is willing to exchange 1 good for the other good in the fixed proportion and it when we get this, when we have 2 different kind of goods available in the market which serve the same purpose like Pepsi and coke or tea and coffee or tea and cola things like that. But, the one catch is there if you should be able to exchange 1 for another in the 6 fixed proportion all the time not necessarily 1 is to 1 ok, but in the fixed proportion, if this is true then we say that this preference exhibits perfect substitution.