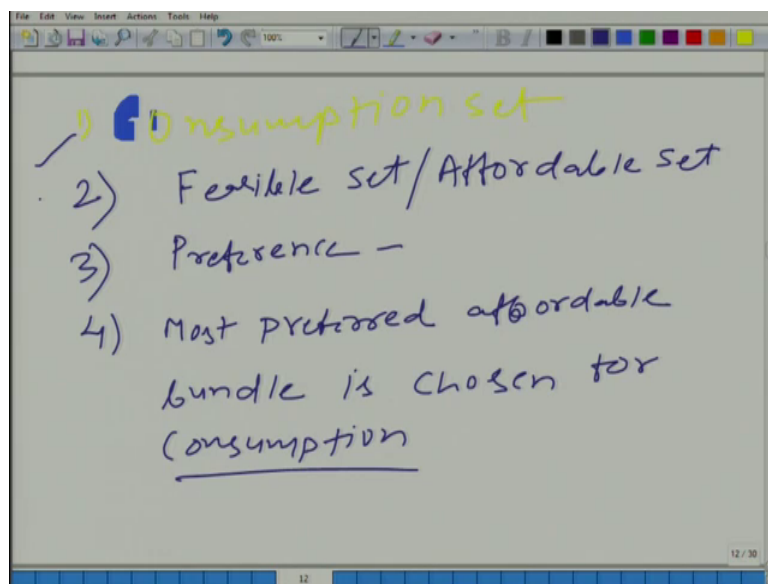


An Introduction to Microeconomics
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Lecture - 54
Utility Maximization

So, far we have been talking about different building blocks of consumer theory or consumer behaviour. We started with we started with consumption set.

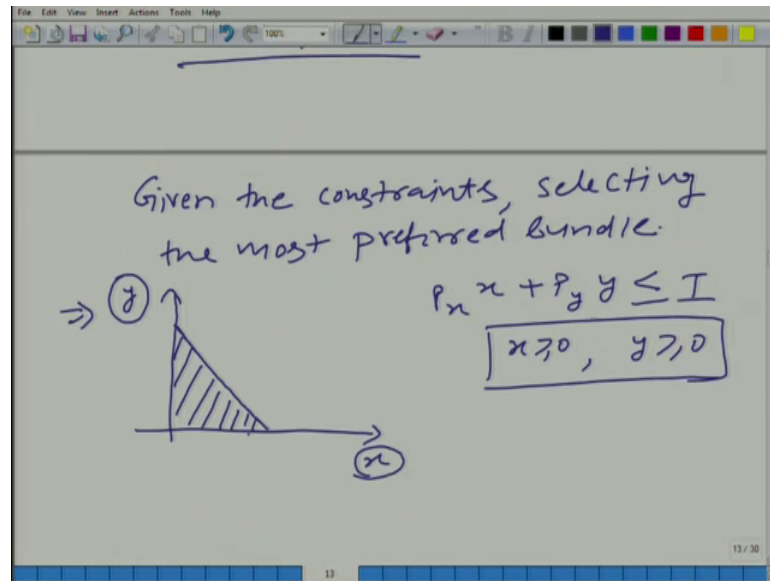
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We started with consumption set then; we talked about feasible set or affordable set, from there we moved to preference to describe taste and liking of an individual. And what we did? We developed axiomatic theory of preferences ok.

And then the 4th building block is very simple it is again just psychological building block; which says that most preferred it is the psychological is said that the most preferred, affordable bundle is chosen for consumption; that is, it very simple. So, we have completed all these 4 buildings blocks consumption set, feasible set, preferences and most preferred this psychological assumption.

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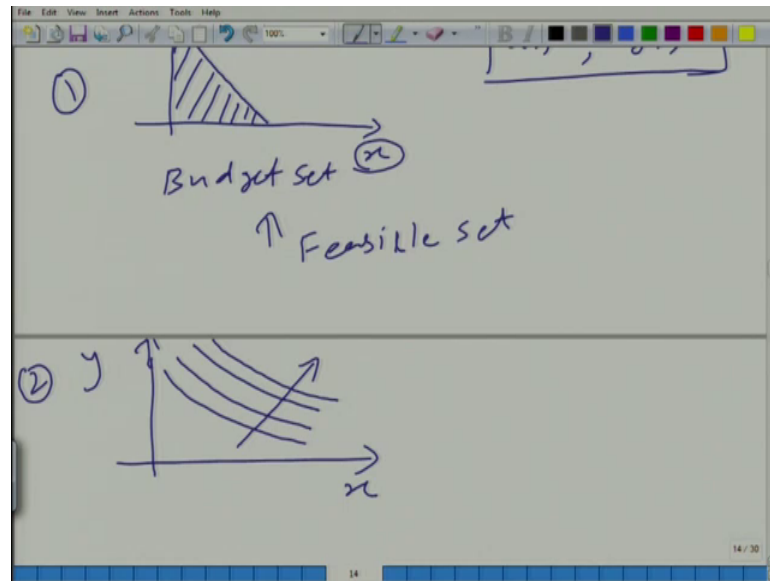


So, the now next step is given the, next step is given the constraints selecting the most preferred word bundle ok. Now of course, unless it is a stated unless it is clearly stated what we will assume that all the axioms that we have talked about; rationality axioms, then continuity, then monotonicity and then strict convexity will be satisfied by individual preference; from time to time some it will be explicitly or implicitly asserted stated that one of these axioms are one of one of these axioms is violated. And then we will have to modify our technique accordingly, but right now I am talking about a scenario where all these axioms are satisfied all these properties are satisfied.

And then we are talking about selecting the most preferred bundle from the set of affordable bundles fine. So now, if you remember your lesson on budget set typically for most of the problem what we figured out that the budget set is unless we have any more constraint let us say 2 good world on x axis we have x, y axis y; x denotes the amount of good 1 y denotes the amount of good 2 then the budget set is like this ok.

And of course, of here we are taking x is greater than or equal to 0 y is greater than or equal to 0. You cannot consume negative amount of any of these goods and what we had figured out earlier that our budget set will be given by this triangular region.

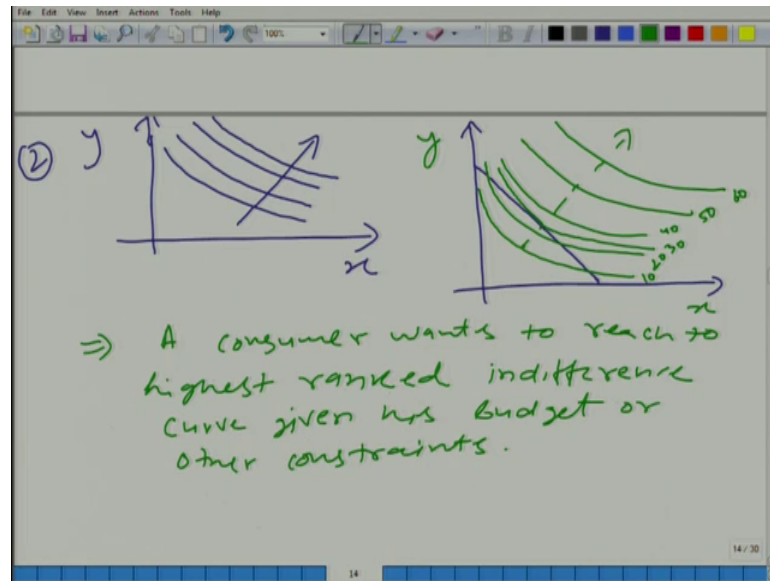
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Now, what we are going to do is, here it is the budget set now let us draw the indifference curve. And this we are getting from feasible set that is our building block number 2. And here we are going to describe preference of a particular individual with help of indifference map ok. That will indicate the choice the the likings of a particular person; and if let us say preference satisfies all the axioms then the typically qualitatively speaking the indifference map is going to look like this fine.

And also, we know that utility would be increasing in this direction. If we superimpose this diagram this is 1 and this is 2, instead of drawing a drawing it separately if I superimpose it on one another how would it look like of course, it is not to the scale. So, just qualitatively I am putting it here.

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So, what I have here is like this, this is the budget line and inside is the budget set including the bundles on this line. And here we have something like this this is the; it is increasing in this direction let me it is increasing in this direction ok. This these indifference curves they represent preference of a particular person.

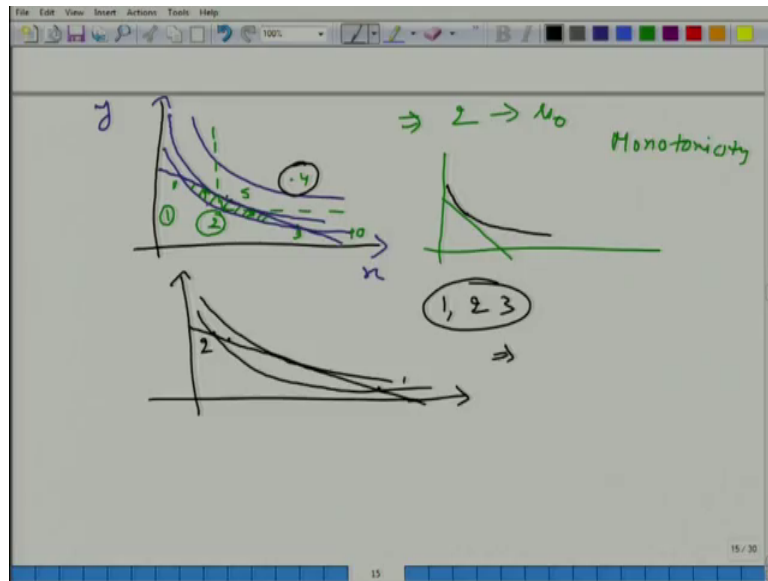
Let say if this person is trying to maximise his happiness why do you want why do you buy a particular bundle remember we talked about the 4th we talked about it in the 4th building block. That a person selects most preferred bundle from the affordable set; so, that is what; so, I can I can translate the, I can translate this consumer problem into, I can say that a consumer wants to reach to highest ranked indifference curve given his budget or other constraint. Although I talk about other constraint, but I in graph and in mathematically we deal with only the budget constraint.

So now let us look at this diagram. What is the aim? Let me draw few more indifference curve what is the aim of this person? Of course, the value let us me put here random value 10, 20, 30, 40, 50 and 60 and so on ok. You can give them different values because utilities ordinal. So, these are just ranking what it says that 20 is more than 10 nothing more nothing less. We cannot say that this person prefers bundle on indifference curve given by value 20 twice more than a bundle on indifference curve given by value 10 we cannot say that we can only compare.

So, here it does not matter whether I say 10, 20, 30, 40 I can say 1, 2, 3, 4, 5, 6 does not matter ok. So, what is the aim? Now let say how can this person maximise his utility; in other word how can this person get maximum possible satisfaction maximum possible happiness given his budget constraint ok. How is it possible? Which bundle should he select?

Student: Tangent

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Tangent so right now let us not make it fancy with the word tangent. Let us let us rule out certain scenario first. Let us say that this point is here we have y here we have x. Let us take this say this point is 1, this point is 2, this point is 3, and this point is 4, this point is 5 ok. Just I have selected few points not so randomly because I want to illustrate how it is happening. So, do you think that if this person selects bundle 2 he would achieve maximum level of satisfaction 5, no why? 2 why?

Student: Because you cancelled 4 decreases.

Student: We can still afford more.

So, the thing is here the basic you should you should pay attention that to this zone, this zone ok, not the zone. Let us look at this part ok, what is happening? That I have drawn axis taking 2 as origin and the axis are parallel to the earlier earlier axis. What is happening? That in this direction if you move, what will happen? This person will get

higher satisfaction more utility that is from monotonicity and in this zone that the zone that I have coloured I have shaded with the green colour, what is happening there? That we are taking this indifference curve. Let say indifference curve 10. What is happening there? That in all the green zone because this indifference curve is dividing the whole of consumption set into 3 part, 1 is this part where all the bundles are less preferred than the bundles on this indifference curve denoted by number 10 ok.

Similarly, but in this zone second is that all the bundles on this indifference curve and third is all the bundles above this indifference curve here this person gets higher utility, but what is happening? Because some of these bundles are still affordable. So, this person can move in this direction and increase his happiness is utility. So, 2 is not the bundle that we are looking for fine ok.

Second thing that we have figured out using the concept of monotonicity that the bundle that would give maximum happiness has to lie on the budget line because, if let say let us look at it let say that we are picking this is the budget line and we are picking a bundle not on the budget line and it is of the bundle is affordable we will pick here here here somewhere.

And there we can of course, move in the this direction and that is, north I think it is north west direction actually north east direction we can move in north east direction and utility will increase. So, the optimal bundle has to lie on the budget line ok. Mind you it is true only if, only if preference satisfies monotonicity axiom if preference does not satisfy monotony axiom then we cannot say that this is true you understand fine this is one thing that we have figured out.

How about bundle 4

Student: (Refer Time: 13:07).

Bundle 4 is not affordable; may give higher utility, but it simply we cannot buy it how about 1 and 3.

Student: Same as 2

Same as 2.

Student: (Refer Time: 13:23).

1 and 3 gives you the 1 and 3 bundle the bundle at point 1 and 3 they give you the same satisfaction level as 2 if you look at this map the way it has been drawn ok. If you look at it here 1 2, but why can not we select 1 and 2 while 1 into both are on the budget line what is the problem there?

Student: Sir we can get a bundle with which has more utility than 1 and 3 and even that monotonicity we can say that by 2 extreme cases 1 and 3 (Refer Time: 14:07)

Yes, using convexity if we take 1 and 2 and we connect them then all the bundles on this line are more preferred than any of these 2 bundles. So, we would not so where we will get basically, where if the indifference curve is crossing the budget line at 2 points then we cannot get the our optimal bundle on that indifference curve is it clear.

So, there is only one possibility left at our optimal bundle where the indifference curve touches the budget line at only 1 point and that point will denote denotes the bundle that gives the maximum have possible satisfaction to this individual fine. And that bundle is of course, in this graph it is fifth.