An Introduction to Microeconomics
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Lecture – 133
Price Discrimination

So, let us talk about Price Discrimination.

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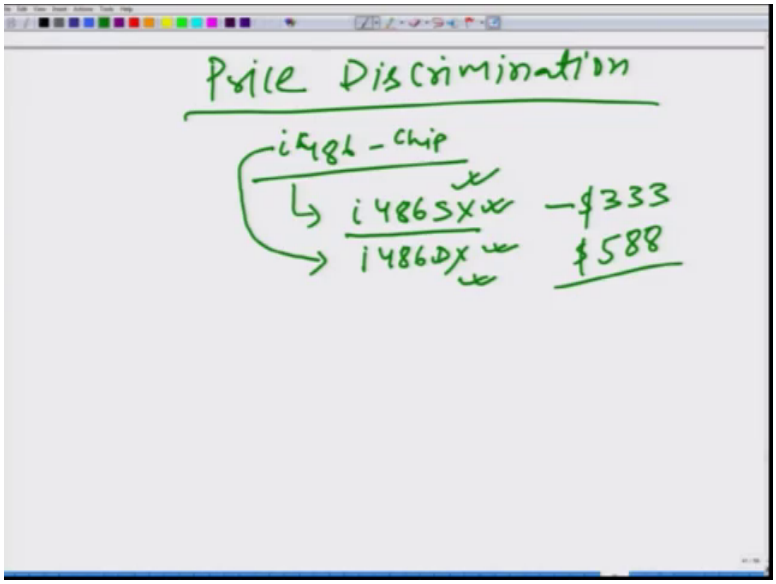

What do we mean by price discrimination? So, when the seller and most of the time monopolist, but not necessarily always monopolist; So, when the seller sells its product, the same product at different prices to different people then we say that seller is practicing price discrimination and its ubiquitous we all had experienced some sort of price discrimination.

Now, these days Indian railway has also introduced some kind of price discrimination. If you purchase your ticket early you have to pay less when you purchase the same ticket for the same kind of service let us say class AC 2th year the price of ticket goes up. Railway is calling a dynamic, but it is not dynamic, but that is topic for some other time. Airlines they always practice some sort of dynamic pricing. Hotels they practice some type of dynamic pricing.

When we look at the books first the hard bound books there is not much difference between hard bound and soft bound books, but we see the price difference is huge between these two different books. So, one can say, but these two different books are two different products and that is why they are priced differently true. But let us also understand that we are abstracting from reality in many way in this textbook setting.

So, when the difference in the quality cannot justify the difference in price then we say that the price discrimination is happening. So, there is one interesting story from Intel in 1989 it launched i 486 chip, i 486 chip. It was quite advanced for his for its time. And it can do several things more importantly it can do also do some mathematical calculation quite in a in a quite fast manner. After some time Intel launched another version of i 486 and called it i 486 SX.

What was the difference? That i 486 SX could not do this these mathematical processing and Intel renamed the original i 486, i 486 DX. So, the SX this chip SX chip was nothing new it was exactly same DX chip, but what Intel has done that it had disabled the mathematical processing capability of this particular chip.

So, if you think about it the cost of production for the SX was more than the cost of production for DX still Intel sold this SX chips at approximately 333 dollar per chip and DX at 588 this is an example of price discrimination. So, our attempt today is to understand why do these forms practice price discrimination what is the advantage of this price discrimination.

So, let us take a look at a theoretical construct first and it is difficult to find the real life example. So, this is called perfect price discrimination ok. This is also called first degree price discrimination.

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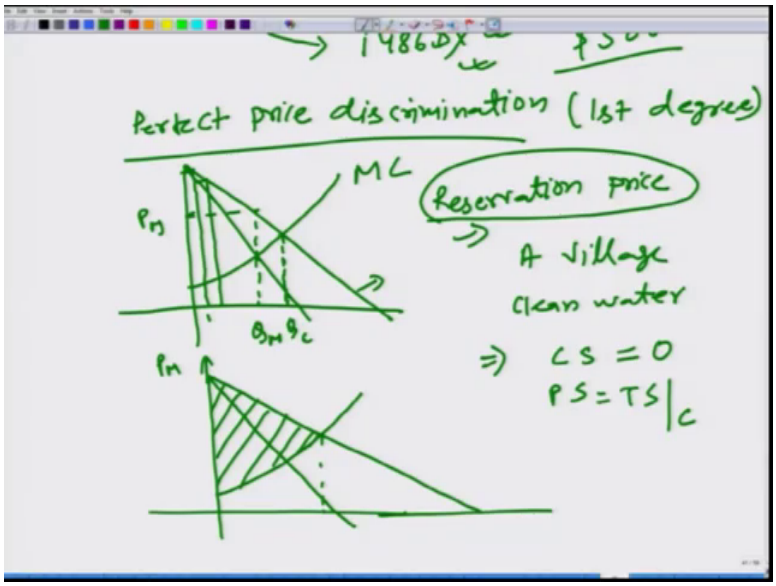

So, let us take a look at monopolist. What is happening is again we are repeating what we have seen earlier marginal cost, marginal revenue. So, if this monopolist has to sell its product at only one price of course, from the diagram it is clear that it would charge P M and it would sell Q M units of output we have already seen we have given this name as Q C, let us continue with that name.

What happens here even though the monopolist is charging higher price we have seen that consumers get some surplus because consumer who is here pays a price which is less then what is his willingness to pay. So, let us define something called reservation price.

What is the reservation price? The maximum willingness to pay for a particular unit and we can safely say that reservation price decreases as the consumer has more and more units. What is this theoretical first degree price discrimination? When monopolist is able to charge reservation price from the consumer when we call it first degree price discrimination; What does it mean?

Let us say that a market is made of the same kind of people let us say there are this is a village a village a made up example and there is a seller who sells clean water because let us say this village does not have any access to clean water, and everyone is the same in the economy let us say that this is the demand function of a particular individual. What happens? For the first unit of clean water let us say a bucket of clean water the monopolist says that you pay this much this is the reservation price, for the second unit

the reservation price is going to be less. So, for the second unit the monopolist says that you pay slightly less, but that has to be your reservation price.

What it does basically it would keep on selling till Q C this particular number to the consumer because the till this point the cost of supplying water is less than what consumer is willing to pay. So, of course, here the monopolist would be able to sell more units then the case of monopoly, but the consumer would not get any surplus. So, let us look at it in the graph here once again and let us say it is no longer individual demand curve this is the market demand curve what we get is that all the thing would be captured by the monopolist, because monopolist will take away monopolist will ask these people to pay their reservation price.

What is; there are 2 3 things that we have to be careful here, one why did I say that it is only theoretically possible it does not happen in the real life. The reason is very simple that to charge the reservation price this monopolist has to know how much is the reservation price or how much is the willingness to pay for that particular unit like. It is it is difficult to figure out a scenario in which the supplier would know the willingness to pay of a particular consumer. So, that is the reason we do not see.

Other thing that we also should pay attention to is the what happens to the social welfare. Of course, consumer surplus becomes equal to 0 because consumers are paying their reservation price. What happens to the producer surplus? Producer surplus becomes equal to the total surplus that we get in case of perfectly competitive market because it would sell exactly the same quantity that gets sold that would be sold in the perfectly competitive market. So, all the units would be sold, but the gain would be captured by the monopolist that is first degree price discrimination.

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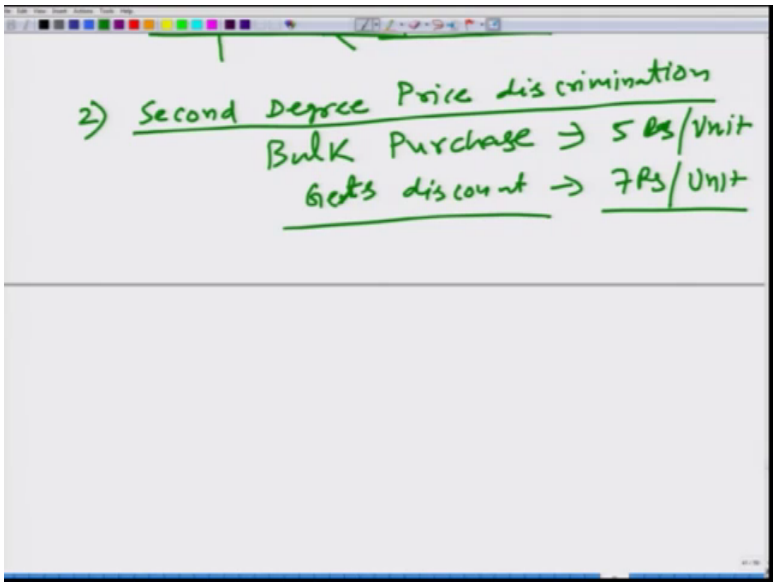

Let us look at the second case of price discrimination that called second degree price discrimination. And what do we mean by second degree price discrimination? It is practice of charging different prices per unit for different quantities of the same good. So, if you buy, so example would be let us say if you purchase 10 units then maybe let us say for example, you will have to pay 5 rupees per unit. But if you purchase only two units then you will have to pay 7 rupees per unit ok. So, bulk purchase gets discount. This is an example of second degree price discrimination.

What is basically happening that here seller is not able to do first degree price discrimination because it does not have that kind of information. So, what it does that depending on the characteristics of the goods being bought by customer it charges different price.

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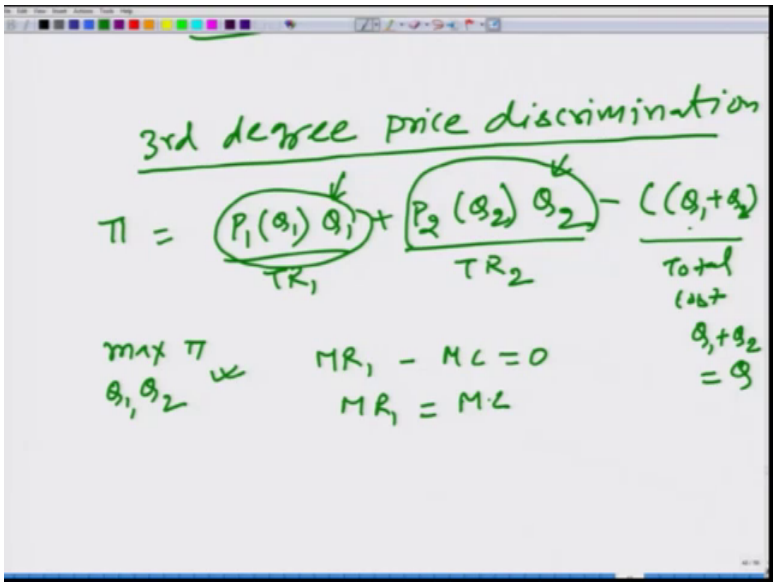

Let us look at third degree price discrimination. What is third degree price discrimination? Here in the second degree price discrimination it was the characteristics of the good being bought or sold in the market was the way to do the price discrimination. Here what form does that form does this discrimination based on the characteristics of the buyer.

So, of course, here what is essential that firm is able to identify the different kind of consumer and the firm is able to segment the market. So, let us do this mathematically its quite important let us say this form is able to sell its product into two different market let us say that P 1 is the price in the first market and of course, it will depend on Q 1 because we want it to be a function of Q 1 and it sells Q 1 amount in the market let us say in the second market it is P 2 Q 2 multiplied by Q 2.

And if we want to do the profit maximization how much is the profit? This is equal to the cost of producing Q 1 and Q 1 plus Q 2, basically this is the total revenue in the market 1, this is the total revenue in the market 2 and this is the total cost. If you do the profit maximization; how do we do the profit maximization? Here the form has to decide Q 1 as well as Q 2. So, when this form does the profit maximization what we have to do maximize pi with respect to Q 1 and Q 2, and also Q 1 has to be a Q 1 plus Q 2 has to be equal to the total output Q.

So, when we do this maximization what do we get? When we differentiate this with respect to Q 1 we get MR 1 that is the marginal revenue from market 1. When we differentiate with respect to Q 1 we do not get anything here because there is no Q 1 and here when we differentiate with respect to Q 1 look at C it is a function of Q 1 plus Q 2. So, what we get? That we differentiate this with respect to Q 1 plus Q 2 we get marginal cost ok, and this has to be equal to 0. So, MR 1 has to be equal to MC.

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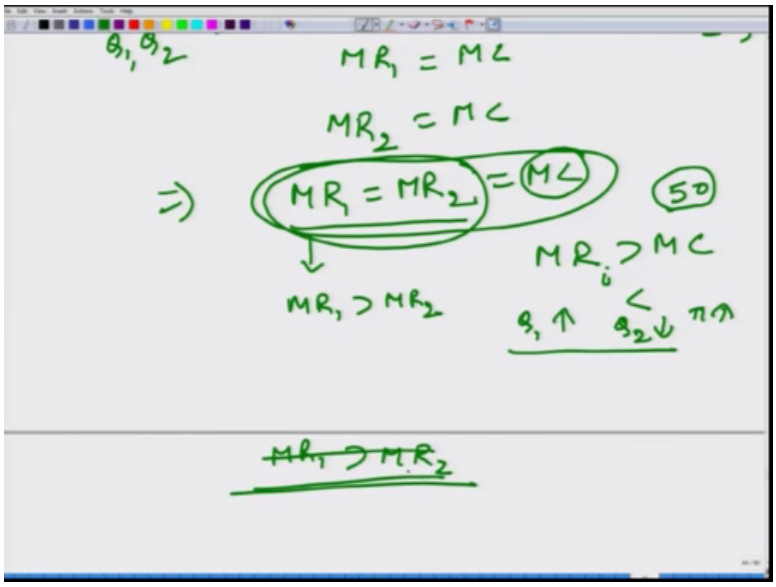

In the second market similarly what we obtain is MR 2 has to be equal to MC. So, the conditions we can write is MR 1 is equal to MR 2 is equal to MC. Let us try to understand it word in words also that rather than using calculus what does this equation mean.

Let us say first it should be clear that if form is selling let us say 50 units the revenue from the last unit has to be equal to the revenue, it has to be equal to the marginal cost that this firm incurs for the last unit ok. Otherwise let us say if marginal revenue either in market 1 or market 2 is greater than marginal cost then it should increase the production and if it is less then decrease the production. So, that we have done it many times.

Now, why we have to pay attention? Why MR 1 is equal to MR 2? Let us say that marginal revenue happens to be greater in the market 1, if it is greater in market one then it makes sense for the firm to sell more items more units in the market 1 then in the market 2. So, in that case Q 1 will increase and Q 2 will decrease. So, the only and the

profit will also increase, it means if this is the case then the form is not maximizing the profit. So, what it simply means is that the revenue marginal revenue should be equal in both the market then only the firm would be doing the profit maximization.

There is another case that one has to be careful about what if that you know MR 1 is always greater than MR 2, then what should the firm do? In that case the firm should never sell any output in the market to, but that is the case we are not discussing.

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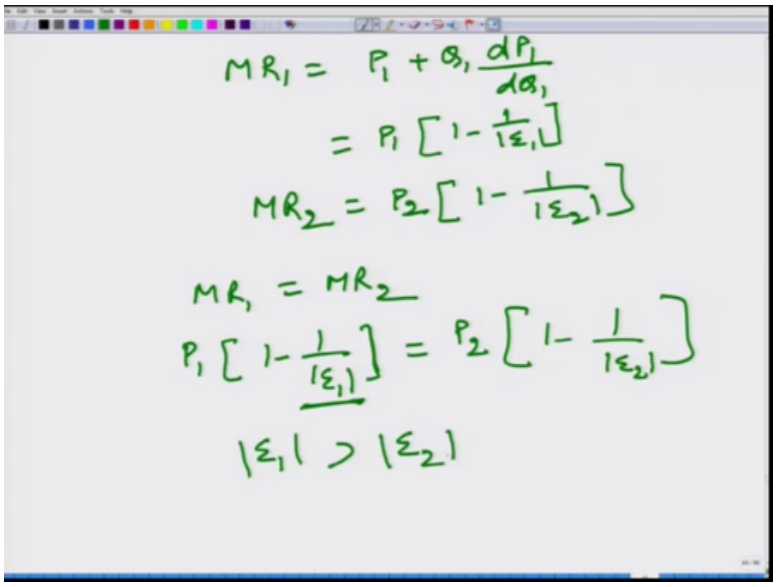

We already know what is MR 1, MR 1 is P 1 Q 1 derivative of P 1 with respect to Q 1 or in other word we can also write it as 1 minus P 1 multiplied by 1 minus price 1 inverse of price elasticity of demand.

And similarly MR 2 is, what we have just obtained that at the profit maximizing label that MR 1 has to be equal to MR 2 what it means that P 1 1 minus 1 by epsilon 1 has to be equal to P 2 1 minus 1 divided by epsilon 2. Epsilon is price elasticity of demand. So, let us say that market is much the demand is much more elastic in market 1. What does it mean? That epsilon 1 happens to be greater than epsilon 2.

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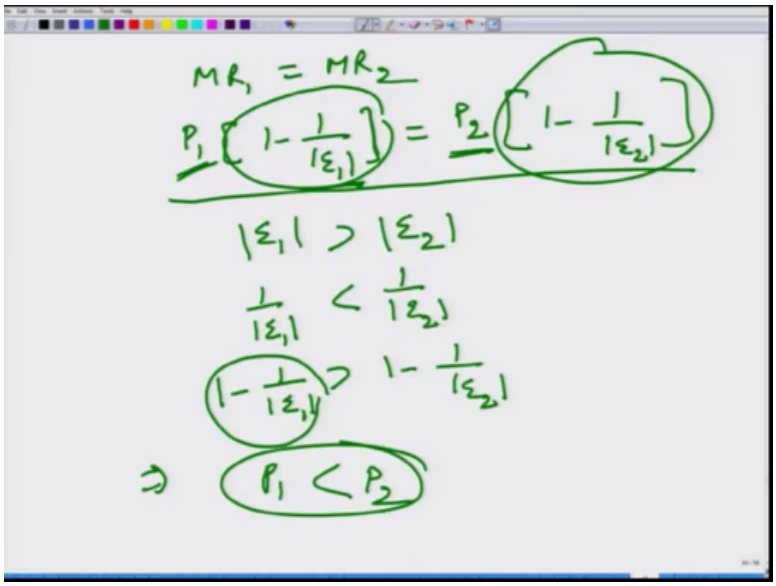

What it means is that 1 by epsilon 1 happens to be less than 1 by epsilon 2, and it also means that 1 minus 1 by epsilon 1 has to be greater than 1 minus 1 by epsilon 2, which in turn because these two are equal. So, if this is more this is more than this then P 1 has to be less than P 2. So, P 1 comes out to be less than P 2. So, when the same form is selling its product in more than one market then it prices its product less in the market in which price elasticity of demand is less, ok.

So, we can say the example of this third degree price discrimination would be let us say that the movie ticket that of cinema hall sells for adult and let us say for school going or students, typically we see that the movie ticket is much less for students than it is for a normal adult. So, this is a practice of third degree price discrimination. So, now, to wrap up this topic let us look at the necessary conditions for price discrimination, successful price discrimination.

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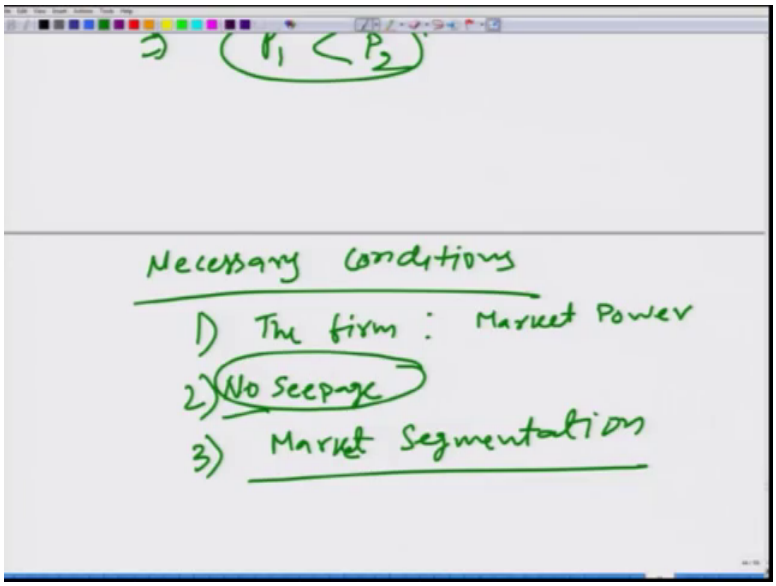

So, the first condition is that the firm should have some sort of market power because if the firm does not have any market power then it does not have any ability to set the price. It has to take price as given and which has to be equal to the marginal cost ok. So, in that case the firm would not be able to do any price discrimination.

The second condition that is required is that no seepage. What do I mean by no seepage? Let us say that if a school if a student buys a ticket and sells it to adult then mono policy is not able to do the price discrimination. So, you would see that whenever cinema halls do this kind of price discrimination they say that your ticket has to be accompanied with the your college ID, college identity card, so to identity to avoid this seepage.

Many times that you see the books different version of books exit exist in the market and sometime its written sales for only in sub Indian continent, Indian sub sales only for Indian subcontinent. It means that these books should not be imported in the developed country where the same book is being sold at the higher price.

Third what is needed that and all are not you know all are not necessary condition some of these have to be met. So, the third is that the firm is able to do some sort of market segmentation ok. Again this is same that form should be able to identify different different kind of buyers like one very if are like say for example, of airline setting airline pricing the airlines are able to charge different prices based on time. So, of course, one

cannot buy ticket in the future and sell it in the past so that works. So, no seepage is very very important ok, otherwise the price discrimination would not walk.

Thank you.