An Introduction to Microeconomics
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Lecture - 125
Monopoly: Price Elasticity of Demand and MR

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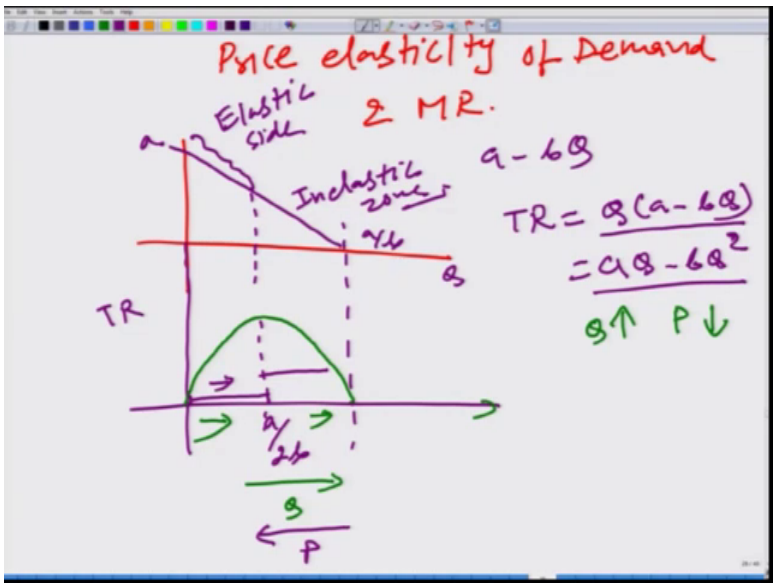

Let us look at price elasticity of demand and revenue marginal revenue. MR you may remember when we discussed the elasticity price elasticity of demand we used the same formula to define the cut off for elasticity. So, we are going to take helps. So, it is in a way it is a revision also ah, but here we are talking in context of the focus is on the monopoly side there the focus was on the definition of elasticity.

So, what we have again if we take a look at a simple downward sloping a linear downward sloping demand function given by a minus b Q. And we have another graph here where we are plotting total revenue what we will see this has to be a and this has to be a by b this is a by 2 b. So, what is the total revenue total revenue is Q multiplied by a minus b Q. So, what do we get a Q minus b Q square this is an equation of parabola if you are familiar if you are not it is do not worry about it.

So, what from here or it is a quadratic equation that is another way to look at it and it attains 0 when Q is equal to 0 and when Q is equal to a by b. So, it is 0 at these 2 points. So, it goes something like this, what is happening? That as Q is increasing Q is

increasing in this direction. As Q is increasing first the total revenue is increasing and then total revenue starts decreasing, but remember that Q is related to P if Q goes up P comes down. So, if Q is increasing in this direction we can say that P is increasing in this direction ok.

So, what is happening in this particular zone? That then we decrease the price because we are moving in this direction decrease the price, then what is happening the total revenue is going up this is the elastic side, where it is happening. And what is happening in the remaining area remaining zone that as Q increasing means P is decreasing then the total revenue is coming down this is in elastic zone ok.

So, we can say and why should we just focus on the graph because in graph the limitation is that we are looking at linear demand function if we take the more general case and we have already done.

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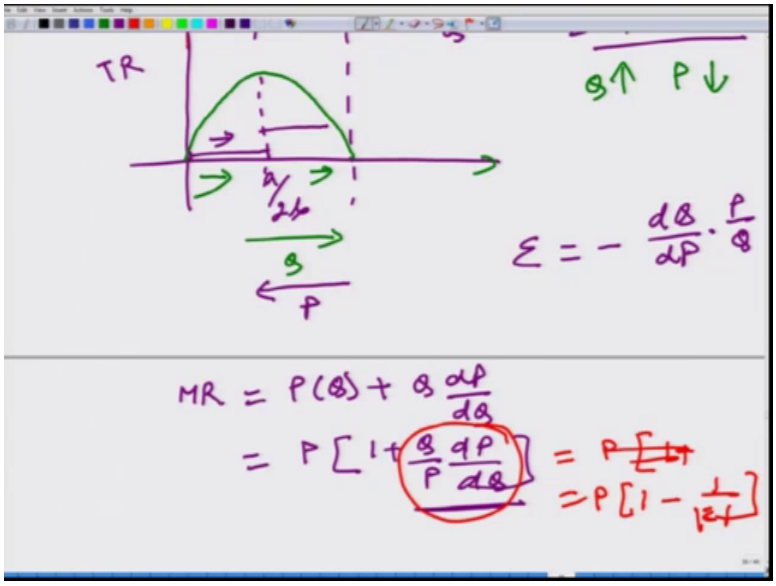

We what we obtain that MR is equal to P as a function of Q and Q d P by d Q and we had done that we had taken P out and what we get is Q by P d P by d Q. Now the way we have defined elasticity that; what is elasticity? How we have defined it? Elasticity we defined price elasticity of demand as d Q by d P; P by Q. So, this entity this particular entity is nothing but it is an inverse of price elasticity of demand with a negative sign. So, this we can write it as P 1 plus or sorry, P 1 minus 1 by mod of epsilon ok. This is exactly what we have done here in the in a particular case of downward sloping linear

demand function. So, we can relate what we can say that when the price elasticity of demand is it is elastic; what does it mean if it is elastic if elastic? It simply means that epsilon is between 1 and infinity.

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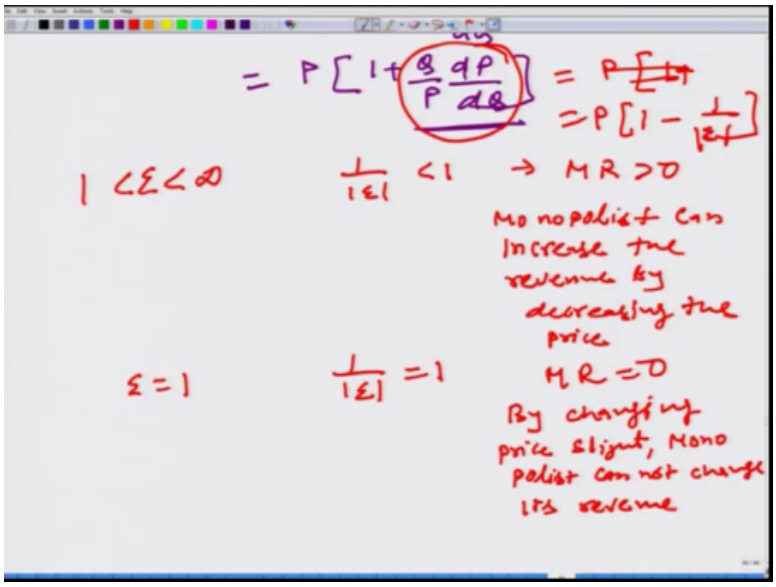

In this case what would be one divided by 1 of mod epsilon it is going to be it would be less than 1 and therefore, MR is going to be positive. So, in this case monopolist can increase the revenue by decreasing the price.

Now, let us look at the case when epsilon is equal to 1, what happens to 1 by epsilon? A function of 1 by epsilon, it is also equal to 1 and MR has to be equal to 0 by changing price slightly, price slightly monopolist cannot change it is revenue.

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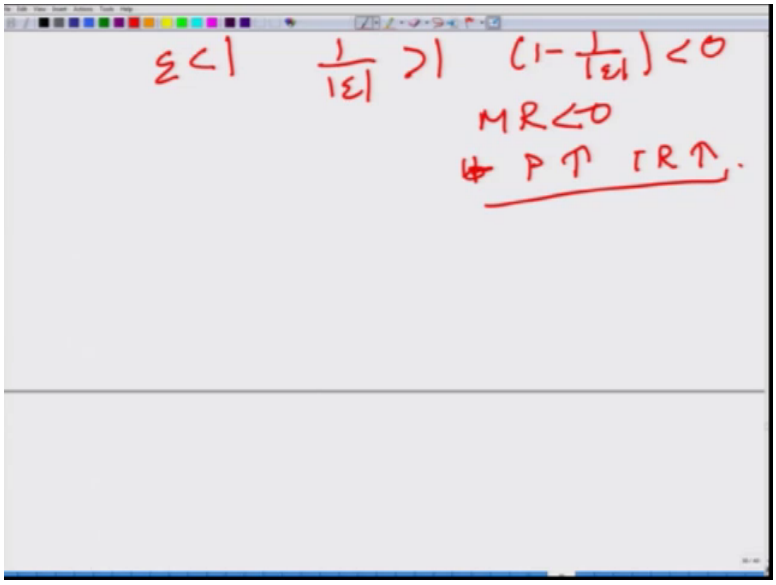

So, third case let us look at when epsilon happens to be less than 1, what will happen to 1 by epsilon it would be greater than 1 and as it is greater than 1 minus 1 by epsilon, sorry it has to be greater than 1, this will become less than 0. And so, MR is less than 0. So, what happens here? That if the monopolist increases the price if monopolist increases the price revenue also increases ok. So, this is the relationship between price elasticity of demand and the monopolists revenue.

Thank you.