**W9 V2 Monopoly Market**

0:09  
In this video, we're going to describe the monopoly markets to talk about price quantity, focus on the differences and why we get a different outcome from the perfectly competitive market and then try it to the elasticity of the demand curve.

0:24  
OK, so firms are very boring.

0:27  
All they care about is profits.

0:28  
Principle one, all costs are opportunity cost.

0:31  
Principle two, choose quantity first based on marginal revenue.

0:34  
Marginal cost.

0:35  
We've talked about what marginal revenue is, so let's bring that piece of the puzzle in.

0:39  
But let's not ever forget about principle three.

0:42  
We tend to forget about that monopolist because we say, oh, monopolist Sir, they're making tons of profits.

0:47  
Always, not always.

0:48  
The case depends on the profits and especially the structure of the cost.

0:53  
So please always check principle 3, even though sometimes we take shortcuts in here.

0:58  
This should be when you're starting out force of habit.

1:02  
OK, now if we're talking about monopolist and we're focusing everything is choosing quantity because then that allows us to go back to first principles.

1:11  
What price do they choose?

1:12  
What monopolist have pricing power in that they can choose a price?

1:16  
So they're going to produce a particular quantity.

1:19  
They're going to go and find the maximum.

1:21  
Consumers are willing to pay for this quantity, right?

1:24  
Same price for everything.

1:25  
So that's the same price you charge for everything.

1:27  
And then that's your market price.

1:29  
Visually, what does this look like?

1:31  
First, I'm going to calculate the marginal revenue, which is we've discussed last video lies below the demand curve.

1:36  
Twice as steep.

1:37  
I'm going to find the quantity where marginal revenue equals marginal cost and then I'm going to project this up to the demand curve because I know demand is marginal willingness to pay.

1:49  
So I can push people all the way up here and charge this price for the last unit to get that last unit bought.

1:57  
But single price assumption means that all units have to be charged this price, meaning that now I have the monopoly price PM and the monopoly quantity, OK.

2:09  
This projecting it up tends to be the one place where students get most confused.

2:13  
Because what they want to do is they want to find this intersection point and project it up here because they're not thinking, they just want to do the same thing they didn't in perfect competition.

2:21  
This here is marginal revenue.

2:23  
It's not price.

2:24  
And you know from earlier discussion price is going to lie above Marshall revenue or marginal revenues below price.

2:33  
Now let's do an example Now.

2:34  
Now I'm working with continuous data and I'm giving you some cost information so we can actually see what we've done in the previous example.

2:42  
What we did in the previous example was the first find marginal revenue.

2:44  
So let's start off with that.

2:46  
OK, I am given a demand curve that looks like this, but as we've discussed, what I need to do is to convert it into price as a function of quantity because I want to take the thinking to extra quantity, extra quantity.

3:00  
So let's move this around and I'm going to get this to be my curve of interest, right?

3:10  
This is my demand curve.

3:12  
That means that marginal revenue is going to be twice this slope.

3:17  
And I'm going to make that a four here.

3:20  
This is my demand.

3:21  
This is my marginal revenue.

3:23  
OK, now I want to set marginal revenue equals marginal cost.

3:27  
In order to find quantities, I'm going to take marginal revenue, set that equal to marginal cost to be able to find the quantity.

3:34  
So let's do that.

3:35  
Here Marginal revenue is 100 -, 4 Q.

3:39  
Marginal cost is Q.

3:45  
Take the queue on to the other side.

3:57  
OK, so the quantity choice, I'm going to put that in a little box here so we can keep that quantity is equal to 20.

4:07  
Most students just stop here might remember principle 2 is what we've been using here and principle two is just this is the quantity I produce if I'm producing.

4:17  
OK, so we just want to always check that principle three at the at the end.

4:21  
OK, so let's keep that here for now.

4:23  
If I was producing this quantity, what price?

4:25  
Well, I'm going to take this price.

4:27  
I want to project it up to the demand curve, find the maximum willingness to pay.

4:30  
My demand curve is given by this equation.

4:33  
So I'm not, I'm not plugging into marginal revenue, I'm plugging it into demand.

4:37  
Find your demand equation and then I'm going to get.

4:40  
So I'm going to write it here, plug Q into demand and then I'm going to get P is equal to 100 -, 2, Q just twenty.

4:58  
OK, So if I produce, I would produce a quantity of 20 and I would charge a price of 60.

5:06  
Good.

5:06  
But I still have to do the last step about checking produce or not.

5:10  
Principle two is just yet.

5:11  
OK, principle three, now I've got to think about total cost, right?

5:16  
Because principle three says total revenue, so you produce 20 if total revenue is at least as high as total cost.

5:27  
So now I need my total cost in here.

5:30  
What is the information I'm given?

5:31  
I'm given only marginal cost equals Q.

5:35  
Total cost we know from before is variable cost plus fixed cost.

5:40  
And I've got a fixed cost of 1300.

5:44  
I don't know what my variable cost is.

5:46  
I got to calculate my variable cost.

5:48  
OK, what is variable cost here?

5:49  
You're going to have to reach into the cost module, pull out that information and bring it back in here.

5:54  
Marginal cost is an equation like this.

5:58  
Variable cost is summing up the marginal cost for each and everyone of the units up to and including 20 units.

6:05  
So it's going to be the area under the marginal cost curve up to 20.

6:10  
OK, well I know that the base is 20.

6:12  
What's the height?

6:13  
Height is just coming from the marginal cost equation.

6:16  
What's the marginal cost equation?

6:18  
Marginal cost is equal to Q.

6:21  
Marginal cost equals P = Q.

6:24  
So if this is 20, this is also going to be 20 which is going to mean that my variable cost is the area of this triangle half base into height.

6:40  
So now I have my total cost variable cost of 200 plus my fixed cost of 1300.

6:50  
OK.

6:51  
That's going to be a lot, right?

6:53  
Because if I'm looking at my total revenue, what is my total revenue?

6:56  
I'm selling 20 units, $60.00 each.

7:03  
Does that mean I don't produce because now my revenue is not enough to meet my costs?

7:08  
This is when again you're going to reach back into your class module and going to ask fixed cost, is it relevant or not?

7:15  
And So what you're going to say is if I'm in the short run, if the monopolist is in the short run, then fixed cost is sunk.

7:29  
They're going to compare 1200 to 400 and they're going to say produce.

7:38  
So I'm going to, in the short run have a quantity of 20 and post a price of 60.

7:45  
On the other hand, if I'm in the long run, If I'm in the long run, then the fixed cost is relevant.

7:52  
Fixed cost is not sunk.

7:54  
In this case, total revenue 1200 is less than total cost which is 1500.

8:00  
So I'm going to choose not to produce.

8:04  
OK, so in the long run I'm going to instead shut down and produce a quantity of 0.

8:10  
Sometimes on the multiple choice question, what phrases to say what will the price these people choose B.

8:16  
So when I have a quantity of 0, what price should I pick?

8:20  
Instinctive here, and This is why we put this in a multiple choice.

8:23  
Question is for students to say I'm going to pick a price of 0, you cannot pick a price of 0 because it's a price of 0.

8:28  
People want to buy a lot and then you're going to have to sell it, right?

8:30  
Because you've posted a price, which means you're going to have to sell it.

8:33  
So you have to pick a price.

8:34  
If I'm forcing you to pick a price so that no one is showing up at your door and then you're completely comfortable saying I want to sell nothing, right?

8:46  
So if you are looking at the demand curve, what does the price have to be in order to get people to sell or to buy?

8:55  
Nothing.

8:55  
So you are going to go back to your demand curve and you are going to say my demand curve is given by P = 100 -, 2, Q.

9:06  
When Q is equal to 0, P is equal to 50.

9:11  
And now students, when they are trying to do this in a hurry, they kind of do this with 50.

9:16  
And then at this point, I want you to stop and see have I made a mistake in here?

9:21  
Is this what you've done?

9:22  
OK, so please be careful with what you've done in here.

9:26  
Take it slowly.

9:27  
Take it carefully.

9:28  
Especially with things like a multiple choice.

9:30  
We're looking for errors like this.

9:33  
OK, so if you're not sure and like me, you want to immediately put 50, be careful.

9:37  
Let's double check.

9:38  
How do we double check this?

9:40  
OK, if I want P as a function of Q, then you do it slowly and carefully and the way you do it is just to say if Q was, I might do it in a different colour.

9:51  
If Q was 0, it would mean that P is 100.

9:56  
OK, so you want to put 100 in here?

9:58  
And how did I get the 50?

10:00  
Because I tried to do this.

10:01  
Well the 50 comes if I'm putting AP equals to 0 and I'm saying what is Q have to be in that case it's going to be 50.

10:10  
OK, that's going to be your demand curve.

10:13  
And so in the long run, if you want to make sure that nobody's coming to you, you post a price that's anywhere 100 or above, because then you're sure nobody is showing up to your door.

10:27  
Let's move on to a discrete example.

10:34  
With a discrete example, we follow exactly the same logic, right?

10:38  
Step one, all costs are opportunity cost.

10:41  
Make sure it's all opportunity cost.

10:43  
In your head, you got up marginal opportunity cost.

10:45  
Step 2, I need marginal revenue prices, not marginal revenue.

10:49  
So take all the information you're given, calculate marginal revenue and you're given that from the previous from the previous module, OK, now I've got marginal revenue and marginal cost.

11:01  
Then you follow what you've been doing with the earlier modules as well, right?

11:04  
I'm going to pick a price so that marginal revenue is at least as high as marginal cost.

11:11  
I sell the first unit 45 versus 5.

11:14  
Great producer.

11:15  
Second unit 37, nine.

11:17  
Producer 2614, yes.

11:20  
Oh, but now I come here, it's going to be 16 and 19.

11:24  
That's not good.

11:25  
I want to go back.

11:26  
OK.

11:27  
Problem with discrete data is when we have the equality, that's not all necessarily going to happen.

11:35  
If you have continuous data, you're going to get the nice equality.

11:37  
If you have discrete data, sometimes you don't have the equality, so you're going to go as close as possible.

11:43  
Largest quantity, so that the marginal revenues at least as high as marginal cost.

11:47  
In this case it's going to be 3.

11:50  
So here, the monopolist will choose a quantity of three and be careful.

11:56  
It wants to choose the highest price so that people buy at least three units.

12:01  
And that's going to be a price of 36, because if you choose 26, that's marginal revenue.

12:08  
That's not price, OK.

12:11  
This is if they're producing.

12:14  
So now you want to come in here and you want to make sure that they are covering.

12:19  
What you're able to do is cover your costs in here you got a scan and see what cost do I have?

12:24  
Do I have any fixed cost?

12:26  
Short run, long run comes in if you've got sunk or not.

12:28  
But here you're given the information that the only cost in here are marginal cost.

12:32  
Now you're golden right?

12:34  
Because produce or not, you're going to check total revenue, which in this case will be 36 \* 3 and total cost will just be the sum of all the marginal cost, which will be 5 + 9 + 14, clearly less than total revenue.

12:49  
So you are going to go ahead and produce 3 units and charge a price of 36.

12:57  
OK, get into the habit of always checking profits, especially and when sometimes in the short run, long run and especially in markets where we have this large fixed cost, this can be a problem.

13:07  
OK.

13:07  
So visually, how can I do that, right?

13:10  
Because I've got to keep track of that.

13:12  
And visually, we already know how to do this.

13:14  
The way you do it visually is you do all of your marginal revenue, marginal cost, find the price and then at the last point in the project on your average total cost.

13:22  
And then you bring in all of your information from your cost curves, your short run, long run analysis in here and it works beautifully.

13:29  
OK.

13:31  
OK.

13:32  
Now let's think about elasticity.

13:35  
So at this point, students come in here and they're like, OK, so I understand hopefully about price, quantity, always checking for profits.

13:44  
Where on the demand curve does this monopolist produce?

13:48  
So here we're going to bring in our insight from the elasticity module.

13:51  
What was the insight from the elasticity module?

13:53  
It said that if I change prices by 10%, right, so that's this column, prices are going up by 10%.

14:02  
OK, response and quantity is going to depend on whether my curve is elastic, inelastic or unit elastic.

14:09  
Elastic demand will fall a lot, right?

14:11  
Which means revenue falls, unit elastic will exactly balance out.

14:15  
So revenue doesn't change and inelastic as a teeny tiny change.

14:19  
So the price effect dominates in here and so far that's where we stopped.

14:24  
But monopolist care about revenue, but they also care about revenue relative to cost.

14:29  
So in this module, we're going to bring in what's happening with cost as well and then kind of put those two together.

14:34  
So if I am raising the price, then it means that quantity is going to go down, decrease.

14:41  
And if I'm producing less than from a variable cost perspective, fixed cost is the same no matter what from a variable cost perspective, my cost will go down, right.

14:51  
So my cost will decrease because my variable cost will decrease.

14:57  
OK.

14:58  
So from that perspective, whatever I produce the cost, when I raise the price, in general my costs are going to go down, quantity is going to decrease.

15:08  
OK.

15:08  
So now what's the net effect?

15:09  
What is the monopolist want to do?

15:11  
If it is on the inelastic portion and it chooses to raise prices, revenues going up and costs are going down, that's a good thing.

15:19  
It should keep going, right?

15:20  
Why stop as I keep raising prices?

15:22  
I'm a monopolist.

15:23  
I want the highest prices possible, OK?

15:25  
If I'm an inelastic and I raise it, my profits will be going up because revenues going up, costs are going down.

15:34  
So I keep going.

15:35  
I do not stop on the inelastic portion on the unit elastic portion, revenues are not changing.

15:42  
So as long as my cost is going down, may not be going down depending on the cost structure.

15:47  
But if my cost go down, if my costs go down, then my profits will go up.

15:53  
All right.

15:54  
So why should I stop here on the inelastic portion, I keep going, so I go from inelastic, inelastic to unit elastic.

16:01  
Once I reach the elastic portion, now I have a trade off, right?

16:05  
Good costs are going down, revenues also going down and now I have to think a little bit more now I have a trade off, OK.

16:11  
So which means that if you're giving me a demand curve and I know in one O one that elasticity changes along a demand curve, OK, I know that over here I'm on the inelastic portion.

16:23  
I know that this magic point here is unit elastic and then here is going to be the elastic portion.

16:30  
So monopolist is going to raise prices, going to go from here, keep, keep, keep raising.

16:34  
The second it reaches the elastic portion, it starts to have this trade off and that's when it starts thinking about where to stop.

16:40  
OK.

16:40  
So the punchline that we got is, in general, OK, a monopolist will produce along the elastic portion of the demand curve.

16:48  
Here's another way to see that if that didn't convince you.

16:51  
Let's look at the relationship between marginal revenue and demand.

16:55  
Notice my marginal revenue curve has gone below the X axis in the way that I've drawn it.

17:03  
Demand doesn't go down because why?

17:05  
We're like, oh, you can come down, but you can't really buy something at negative prices.

17:10  
Why would people put negative prices?

17:11  
Doesn't make sense.

17:13  
But marginal revenue can be negative.

17:14  
Why can marginal revenue be negative?

17:16  
Because remember, we've got the price effect and we've got the quantity effect when I want to sell more.

17:29  
OK, so the previous slide was sell less because the quantity was decreasing.

17:36  
Now I'm going to phrase it as sell more.

17:39  
OK.

17:40  
So the exercise I'm doing is what if I drop price?

17:44  
Then the quantity will go up.

17:48  
When the quantity goes up, my quantity effect will be positive.

17:56  
OK, that's great.

17:56  
I'm selling more.

17:57  
If you go back to the calculations we did earlier, I'm getting a higher quantity.

18:01  
I'm getting more revenue from that.

18:04  
But the price effect here is going to be negative, OK.

18:08  
Price effect is going to pull it down.

18:10  
You're losing money on those previous things.

18:12  
So there's a balance in here.

18:14  
There's a trade off in here for marginal revenue.

18:16  
It could be that the price effect is what dominates, right?

18:20  
I'm losing so many so much revenue from those previous units that this one dominates and I'm actually making negative revenue.

18:27  
When is that going to happen?

18:29  
That's going to happen when I've got inelastic demand because quantity is not changing very much, right?

18:35  
I'm not able to sell very much more, so the quantity effect is not high.

18:39  
Alternatively, if I want to sell that extra unit, I got to drop the price a lot.

18:43  
If I'm going to drop the price a lot, this is what's going to dominate in here, OK.

18:47  
So effectively what we're getting is another way of seeing the relationship between demand and marginal revenue.

18:53  
This point where price effect and quantity effect are exactly the same as unit elastic.

18:58  
Here quantity effect dominates, tiny change in price, huge increase in quantity, prices need to change very much.

19:05  
Elastic demand in the inelastic demand segment is when marginal revenue is negative because the price effect is so huge because quantity doesn't change very much.

19:16  
OK, so monopolist restrict quantity to raise price and increase profits, right?

19:22  
And a single price monopolist in general, because it depends a little bit on the cost structure, right?

19:27  
In general, single price monopolist choose to produce on the elastic portion of the demand curve.