Intro to Economic Analysis: Microeconomics

EC 201 - Day 17 Slides – Set 2

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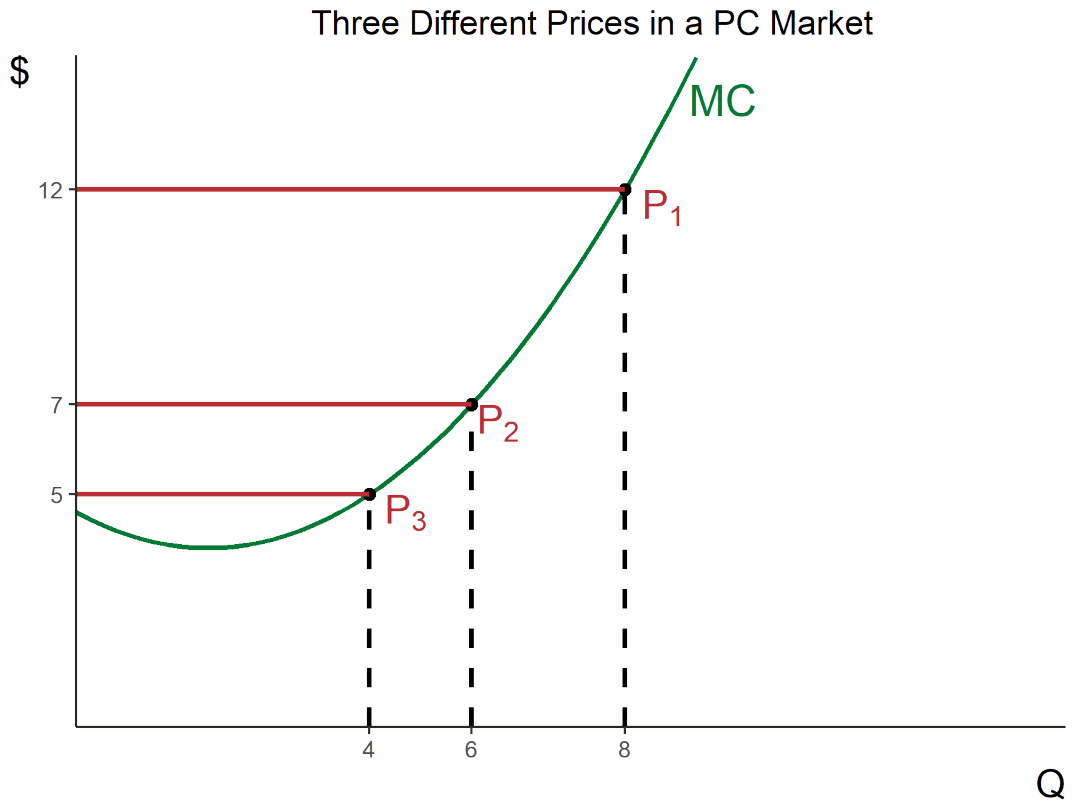
Department of Economics - University of Oregon

22 November 2021

Deriving a Firms Supply Curve

- Recall the typical picture for an individual firm, taking three example prices as given:



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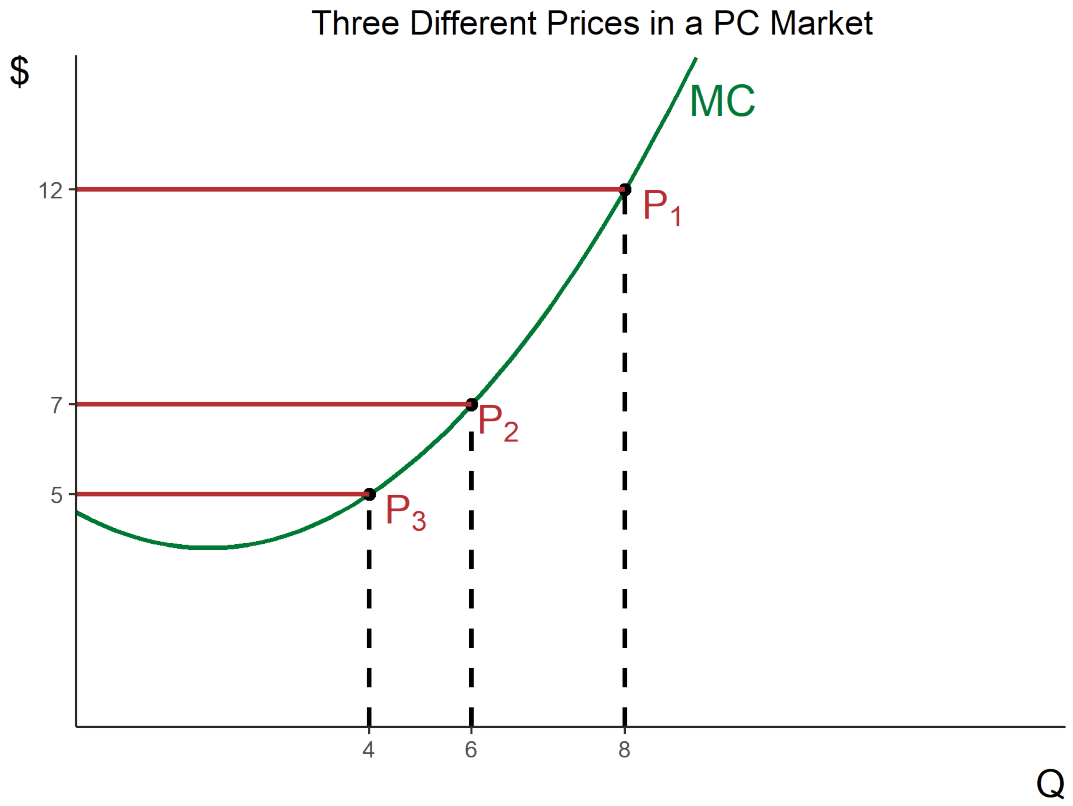

- What do we see?

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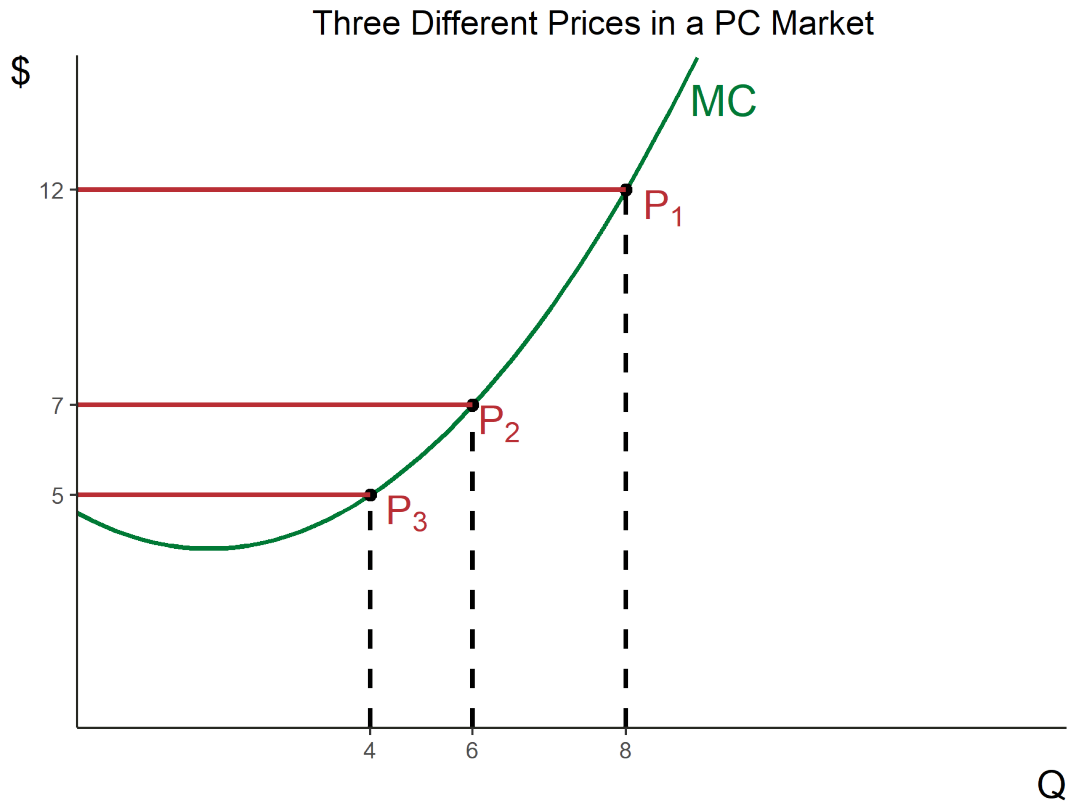

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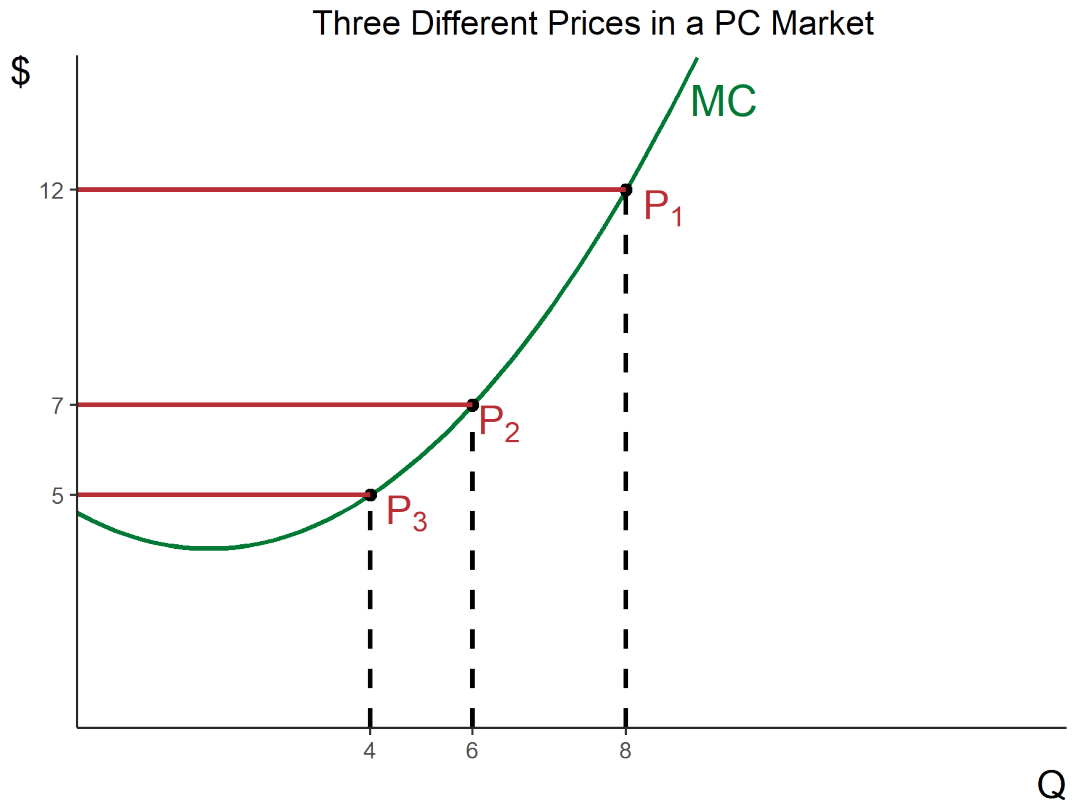

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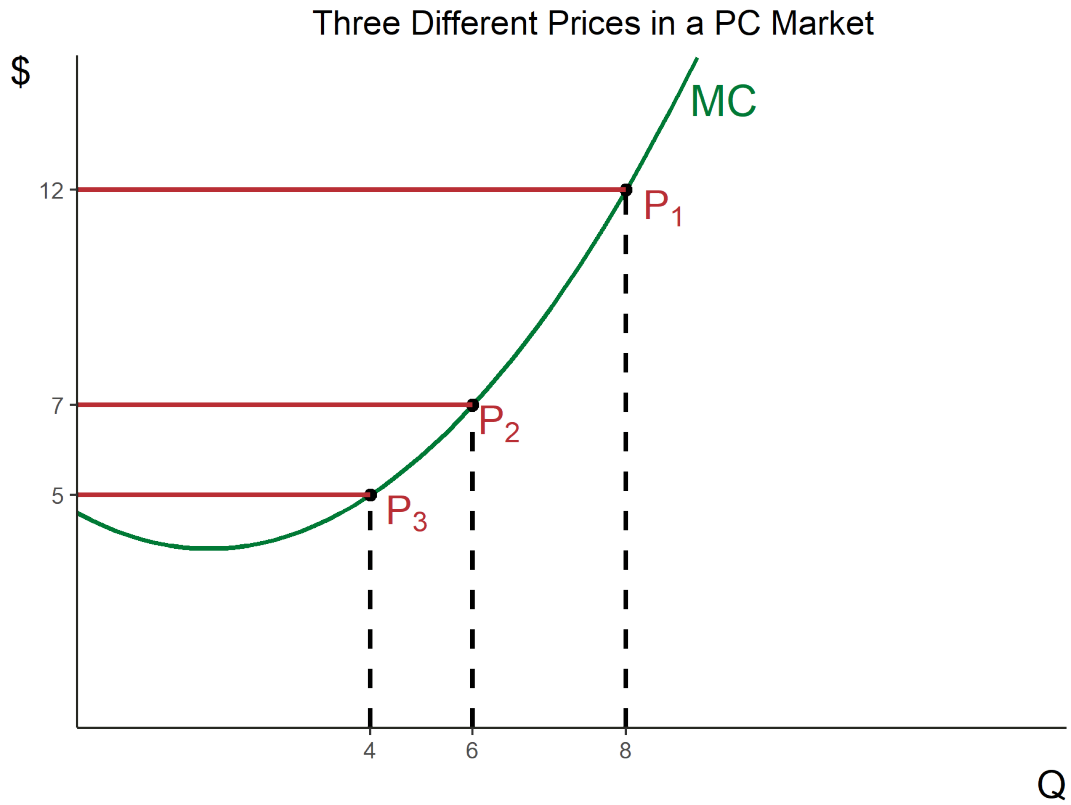

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- Result: a PC firm's MC curve is exactly their SR supply curve, for values above AVC. Below AVC, their SR supply is 0

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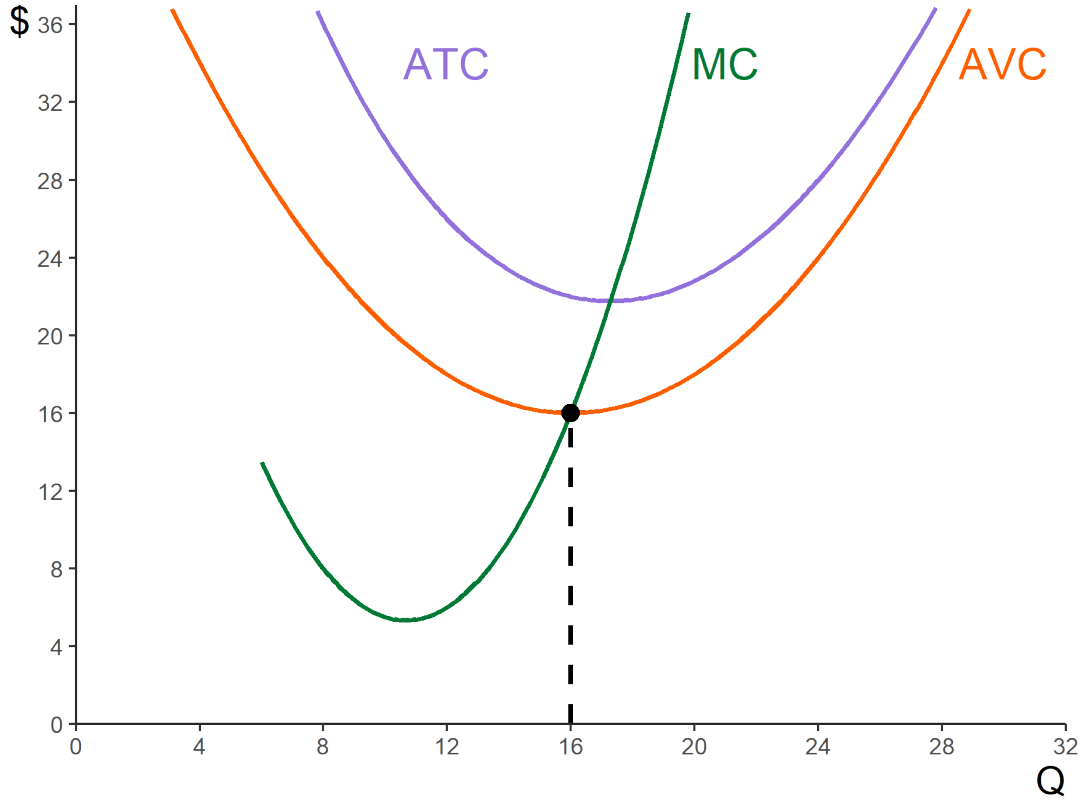
  4. Horizontally sum (i.e., solve for $Q =$, and then sum) individual supply curves to get market supply

MC to Supply, Visually

- Let's start with our base firm. Note the shutdown condition point in this case:



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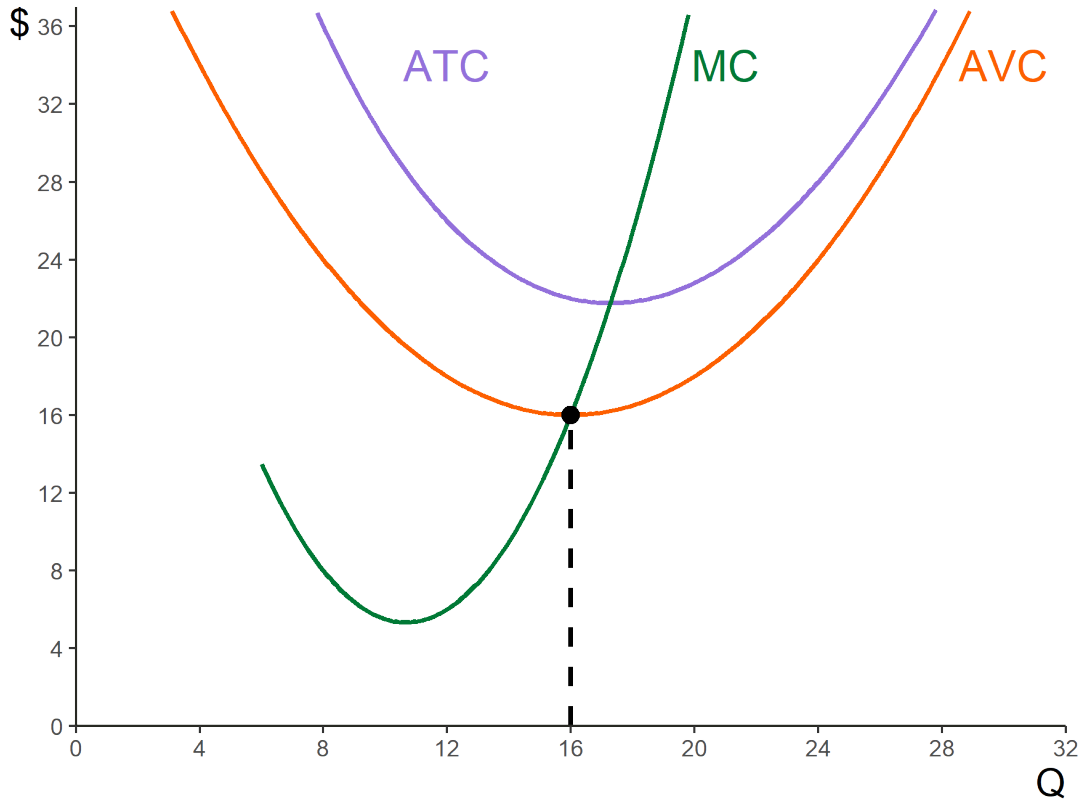
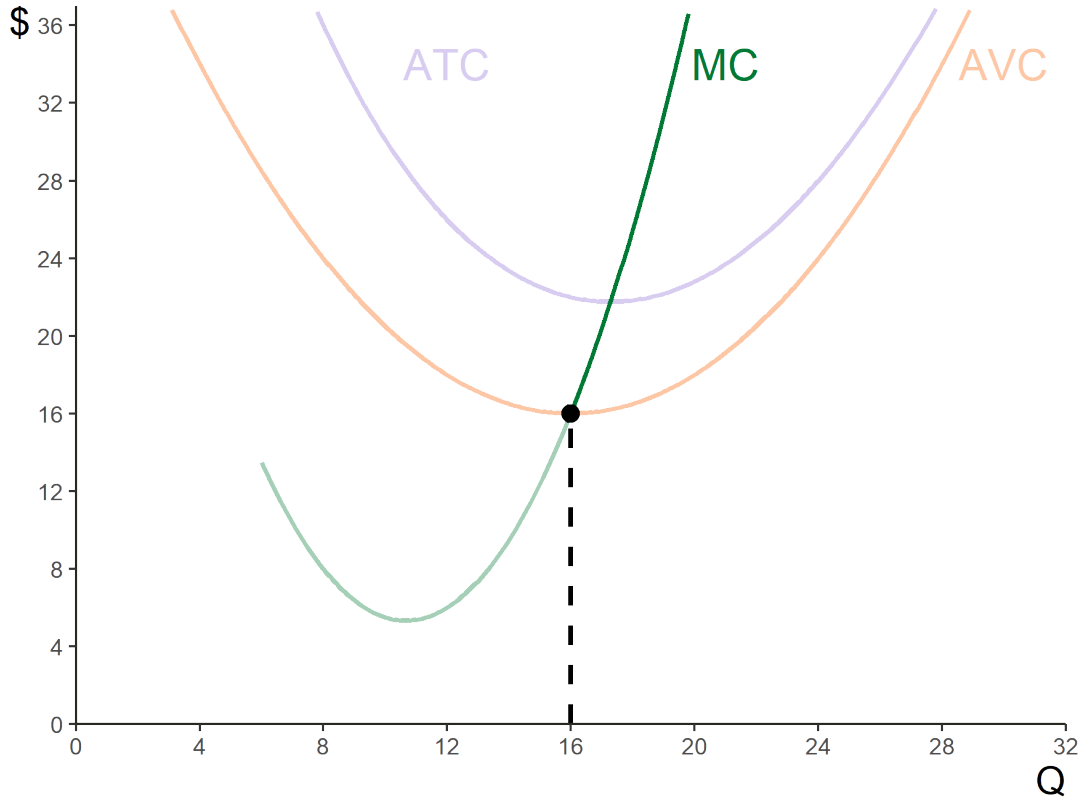


- Let's suppose there are 100 of such firm in the market

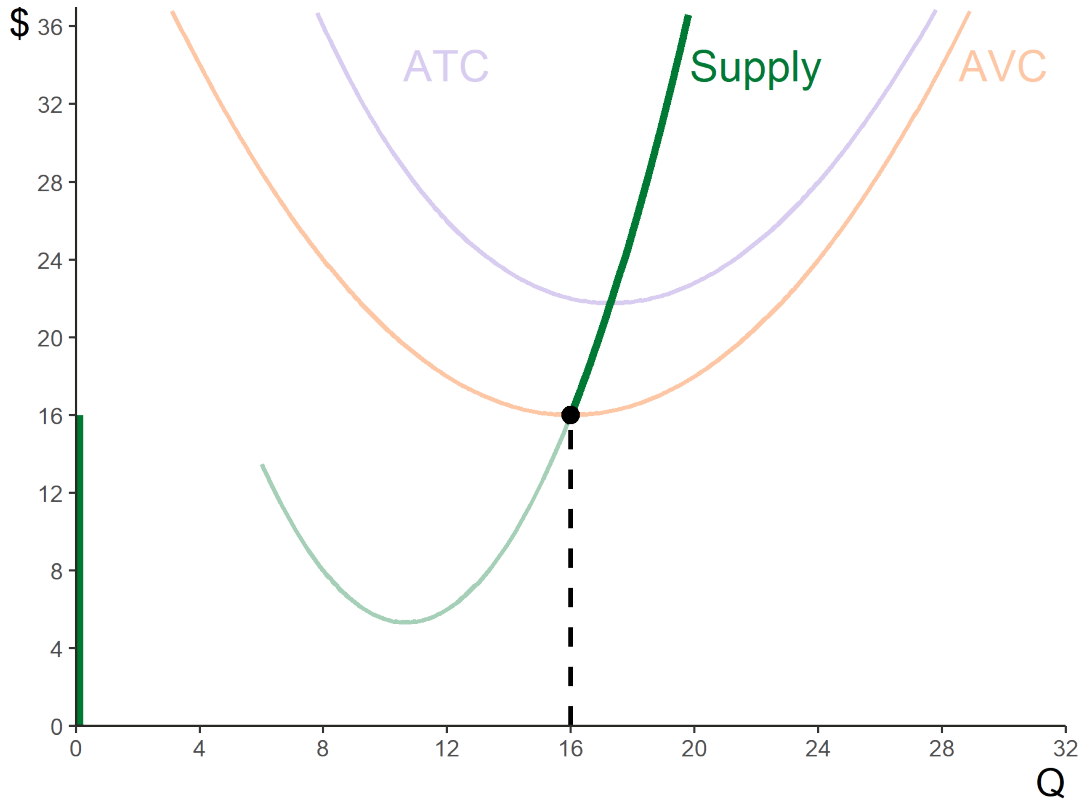
MC to Supply, Visually

- Above the shutdown point on the MC curve will become our supply curve, assuming we are producing



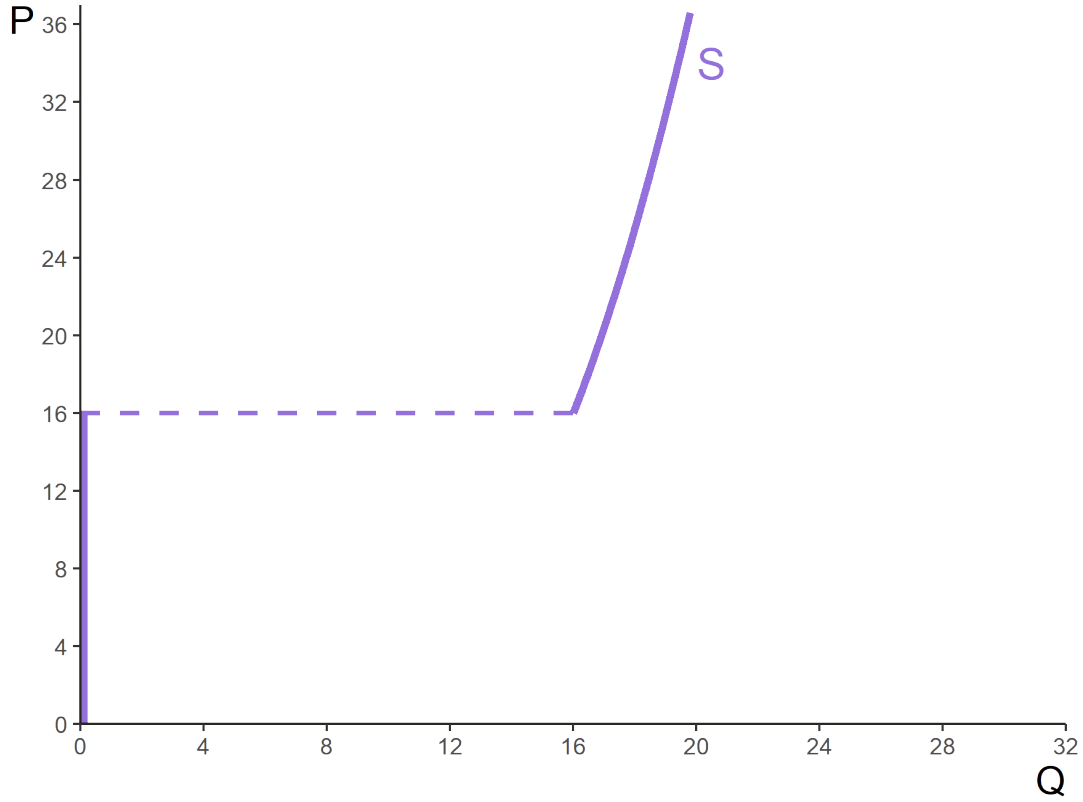
MC to Supply, Visually

- When we shut down, we make nothing:



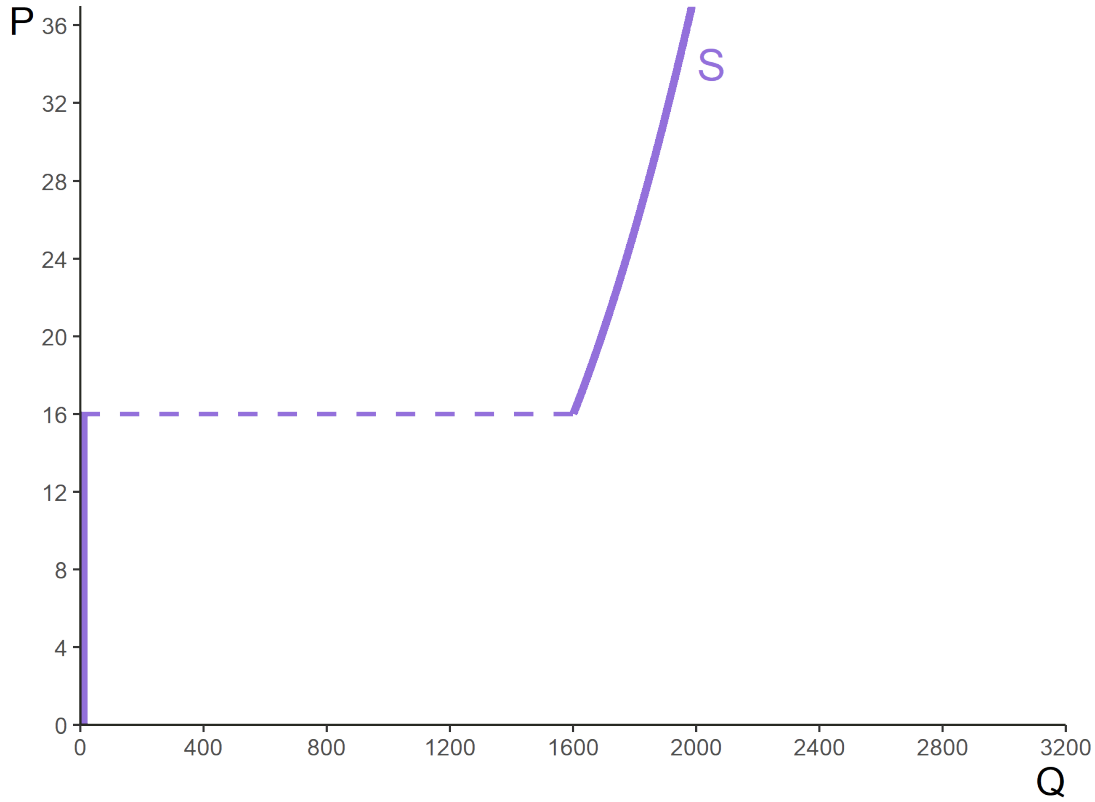
MC to Supply, Visually

- Therefore, our individual supply for a firm in this market is given by



MC to Supply, Visually

- Since there are 100 firms, we have to take a horizontal sum of 100 such curves



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- The real importance is in the long run supply curve for the market

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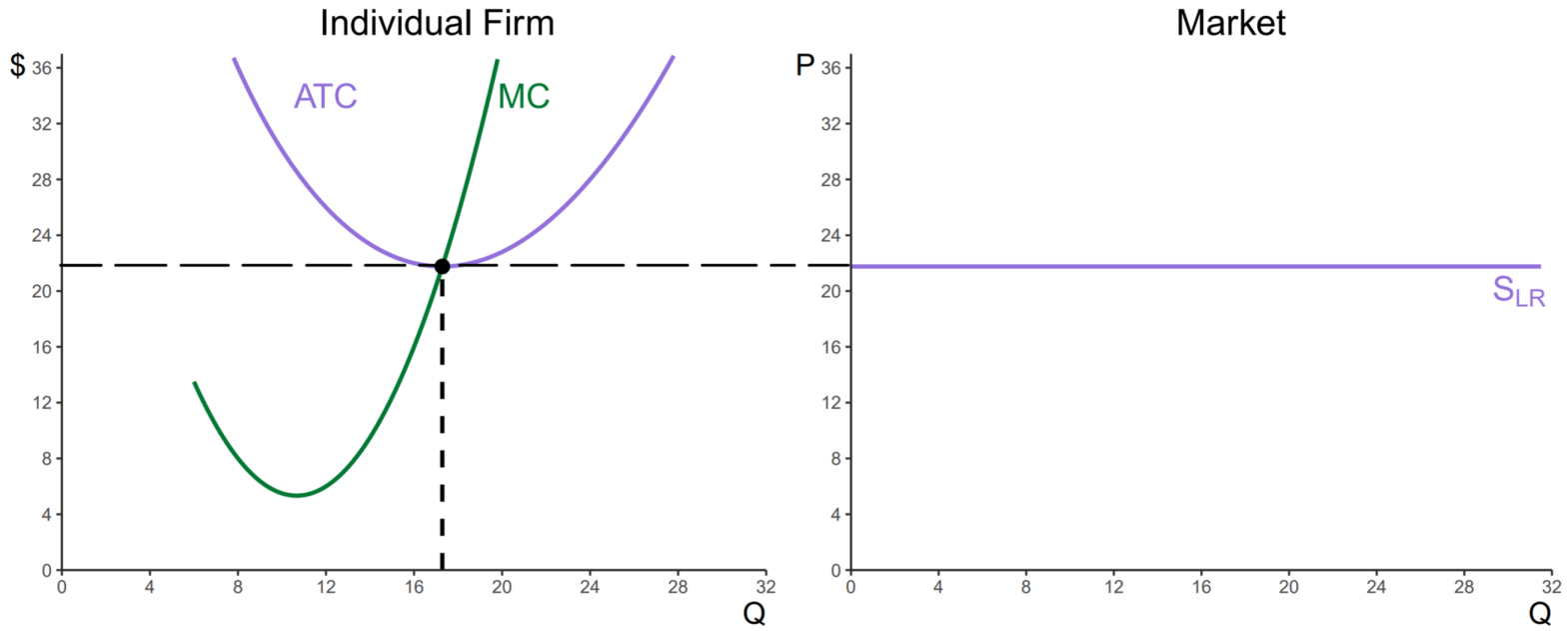
Long Run Market Supply Curve

- In a market with identical firms, the zero-profit (break-even) point for a particular firm defines the long-run supply curve in the market



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- In reality, market demand in a PC market is still downward sloping

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- I won't dive into the numbers, but I'll provide them for reference

Linear Example

- To start, let's assume that there are 50 firms in the market, with

$$
\begin{aligned}
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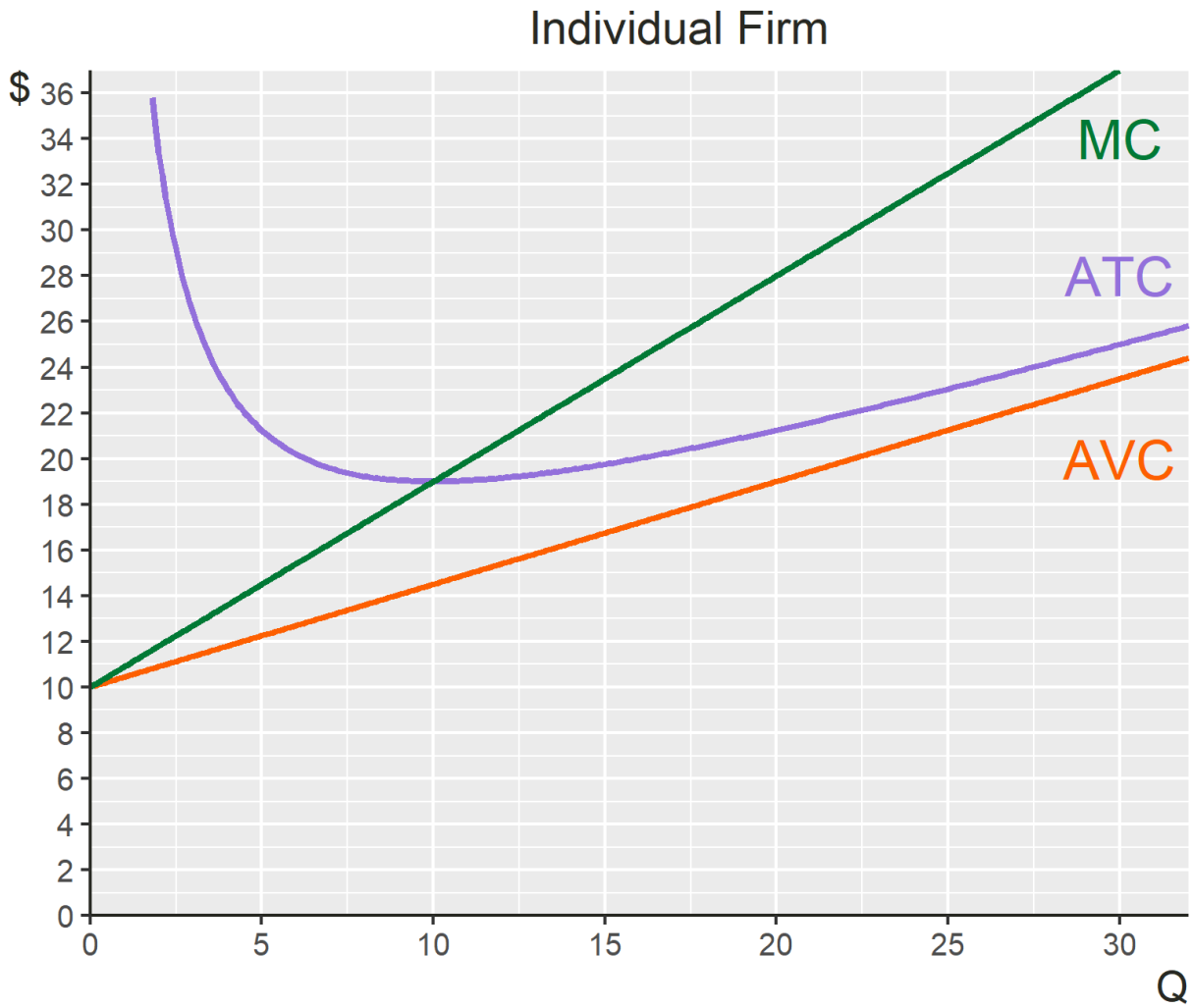
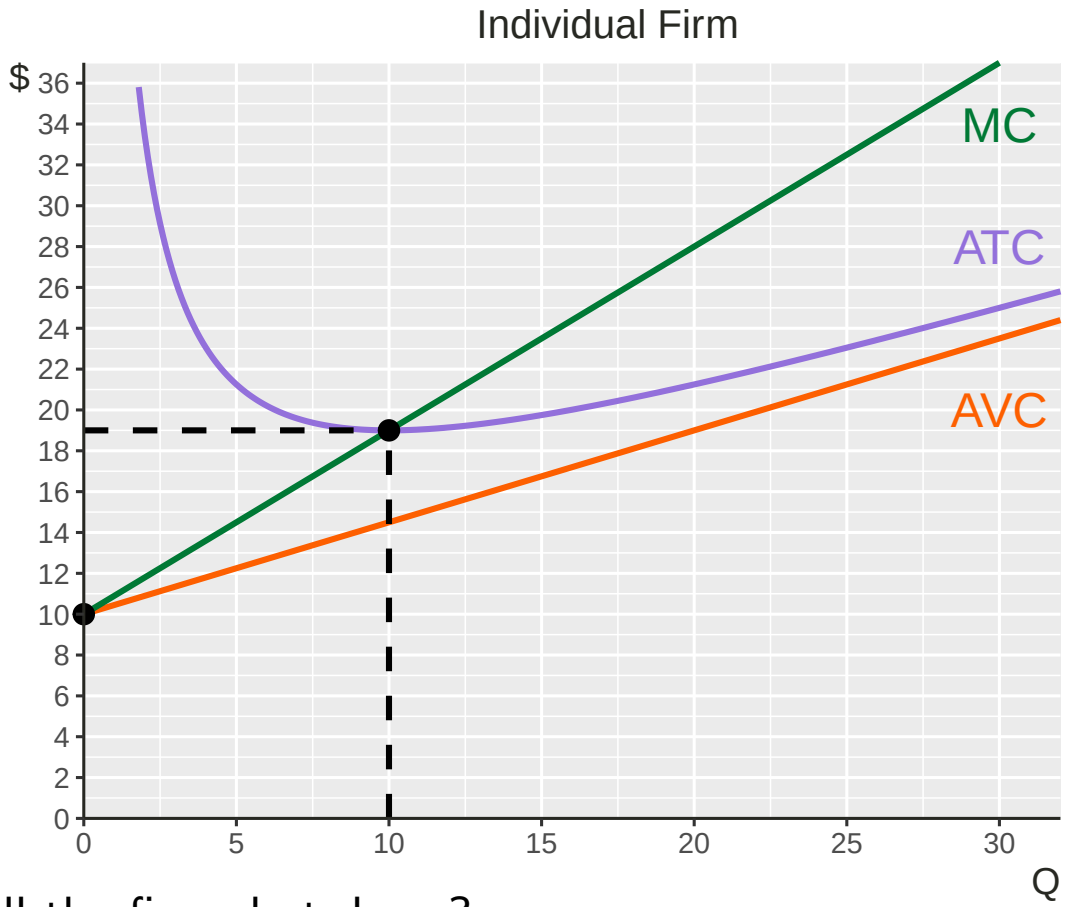
  - $AFC = \frac{45}{Q}$
- What will these objects look like?

Representative Firm

- Next, let's try to graph MC, AVC, and ATC for a representative firm:



Shutdown Condition



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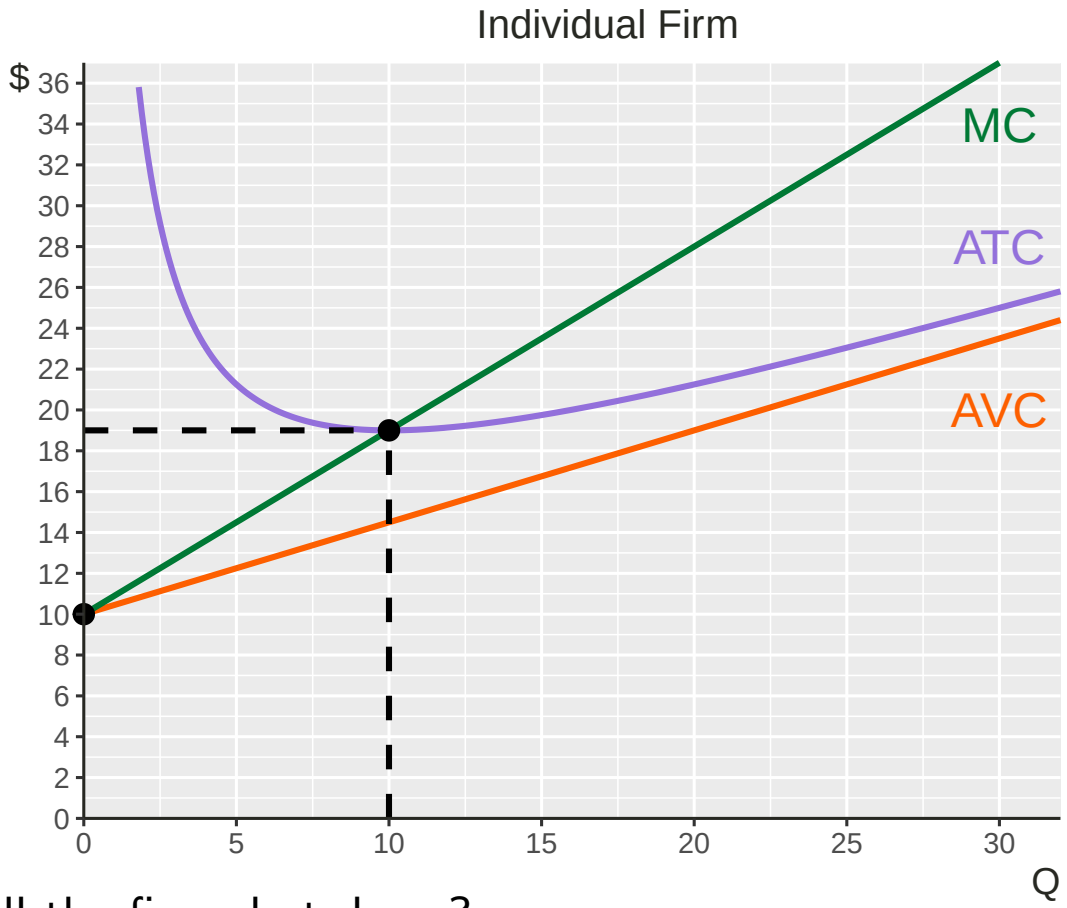

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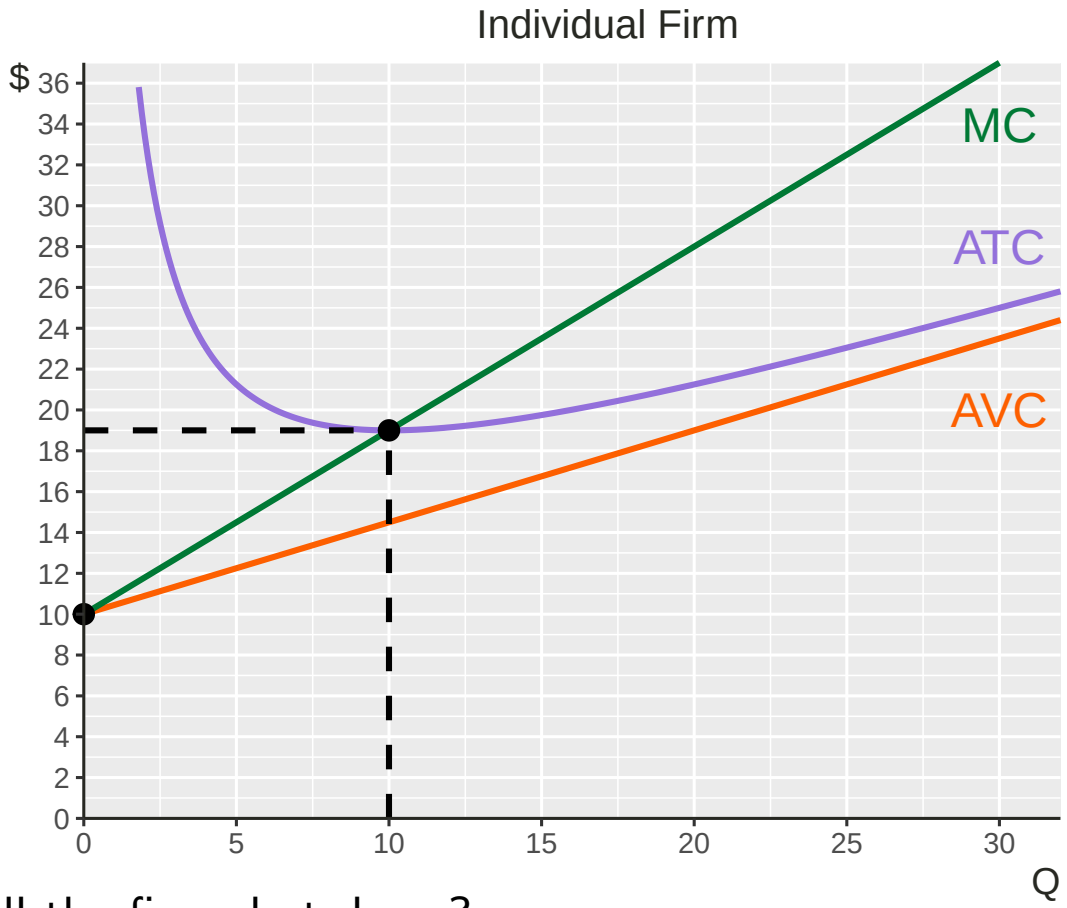

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  - In the long run, exit when $P < 19$

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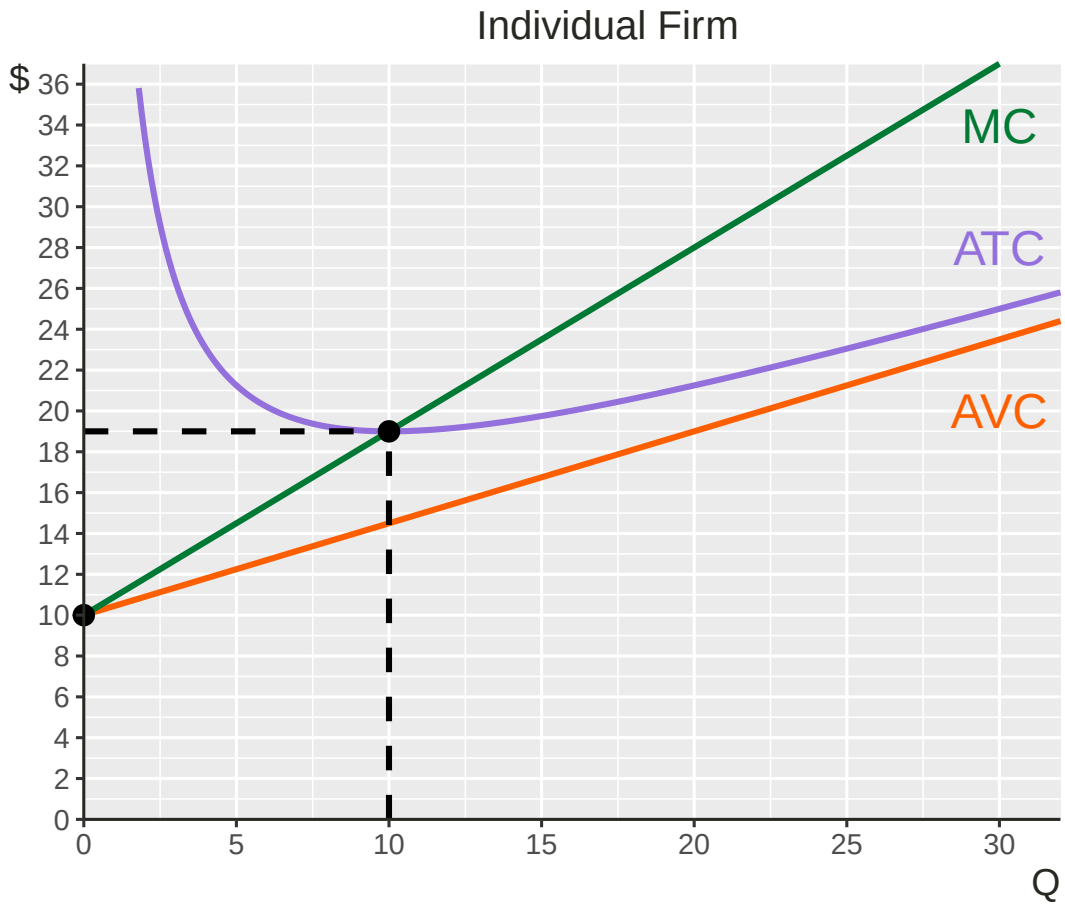
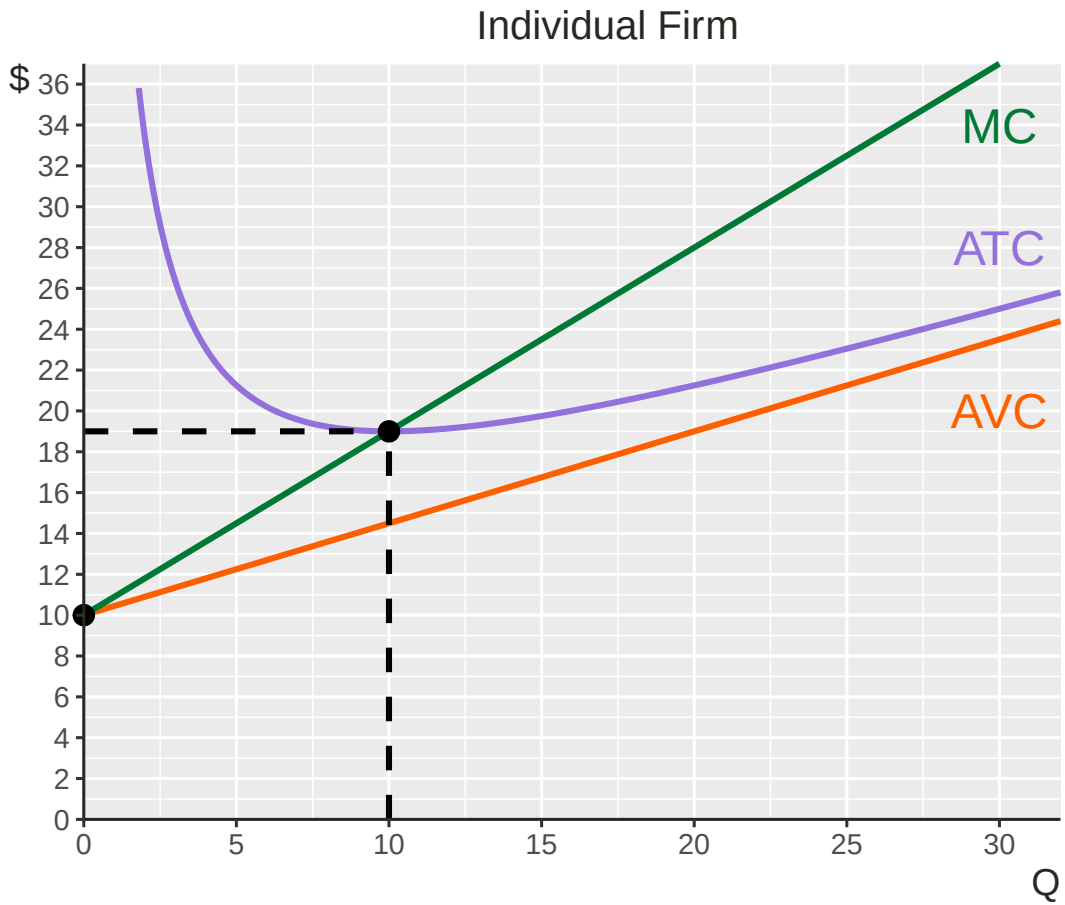


- Where is the break-even point?

Shutdown Condition



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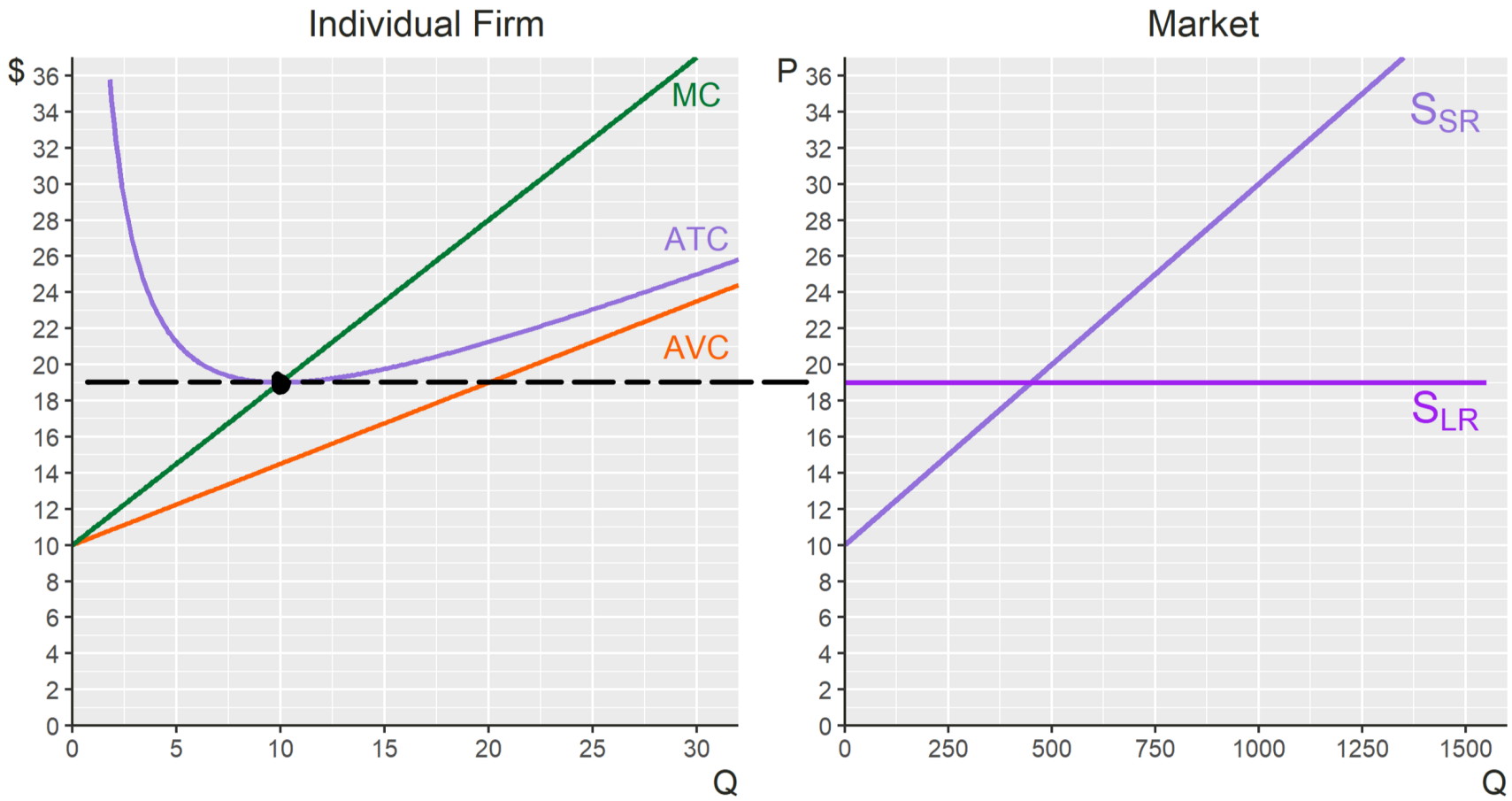
  - Where ATC intersects MC: $(10, 19)$

Market Supply

- This induces the following SR and LR supply curves:



Adding Demand

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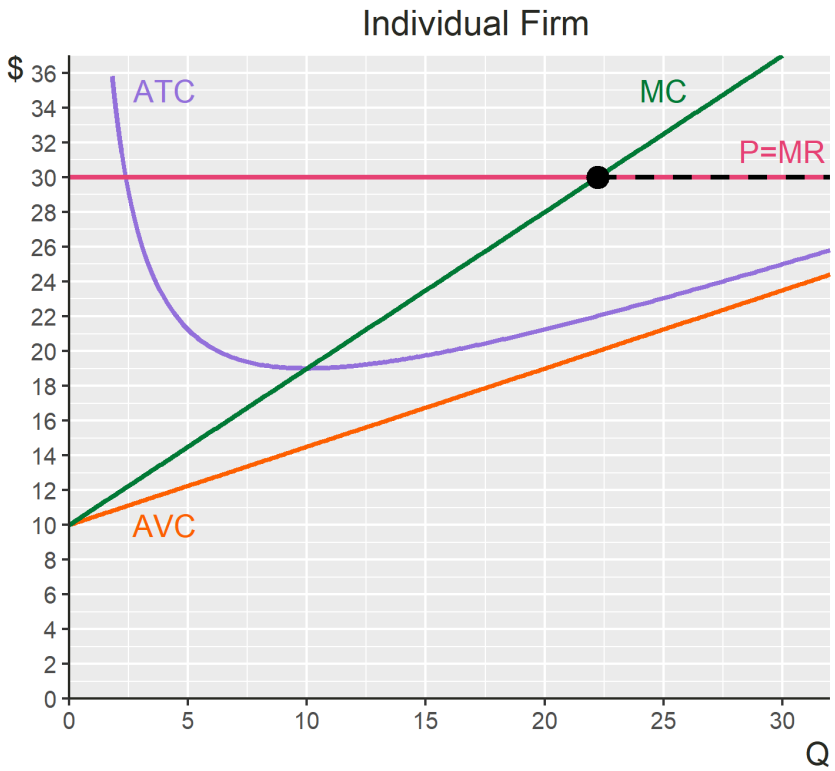
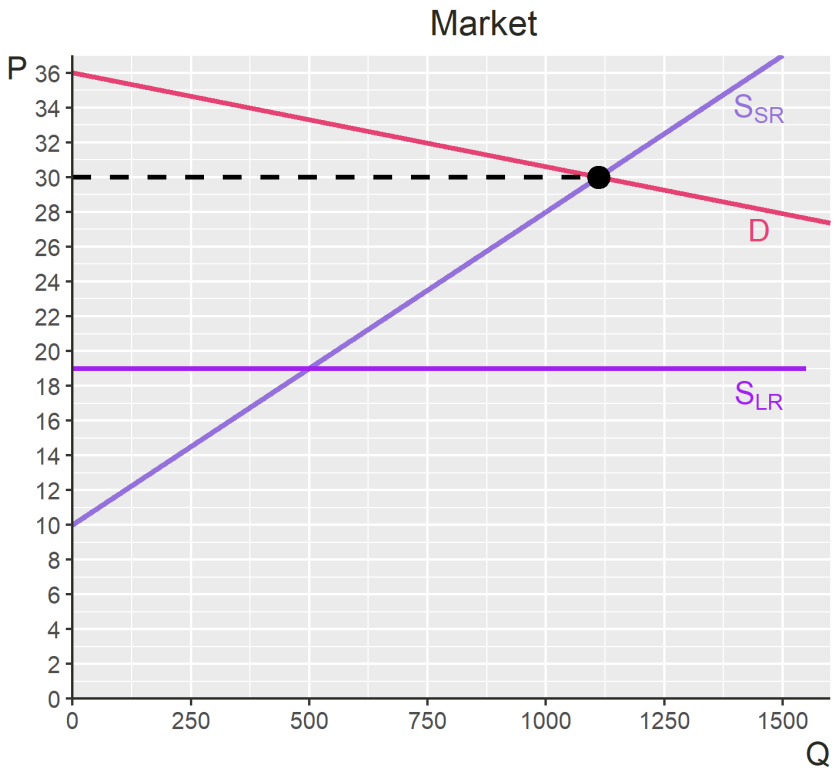
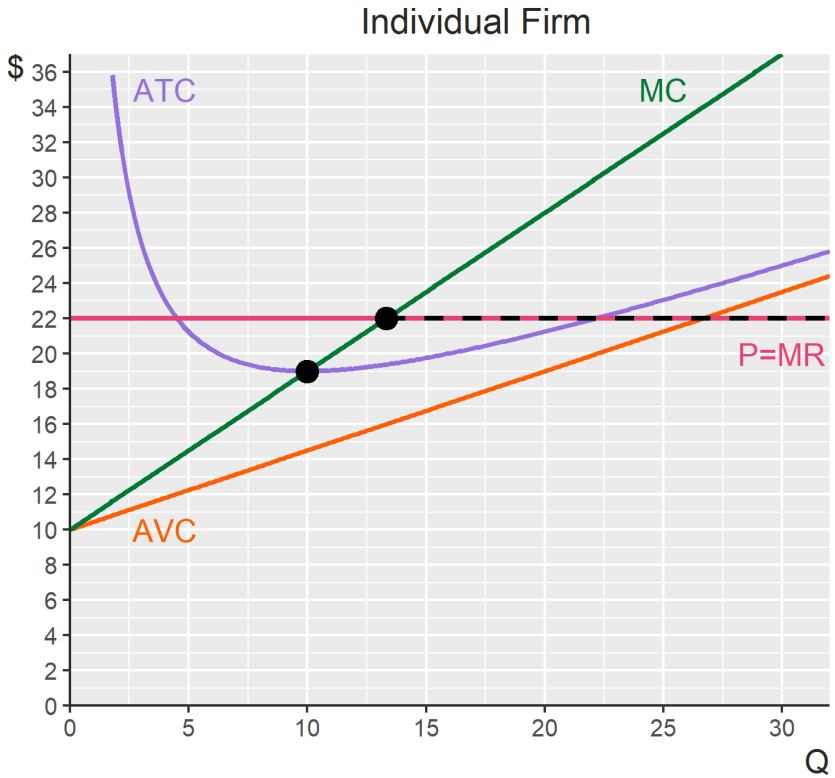
- Demand curves in the market induce $P = MR$ lines for the individual firm

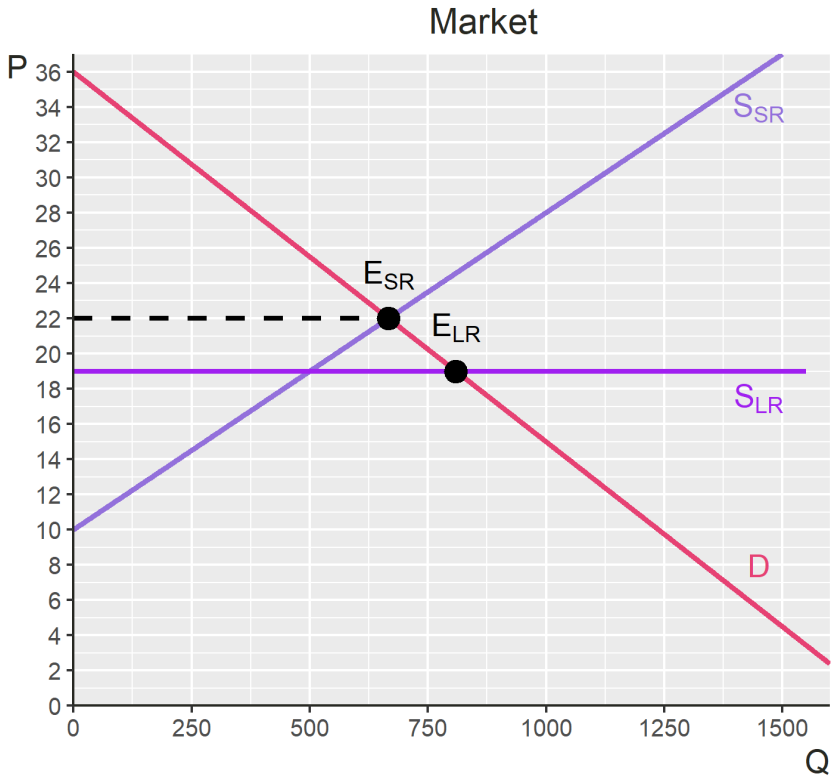




Equilibria

- Note that the following demand curve induces both a short and long run equilibrium. Why?





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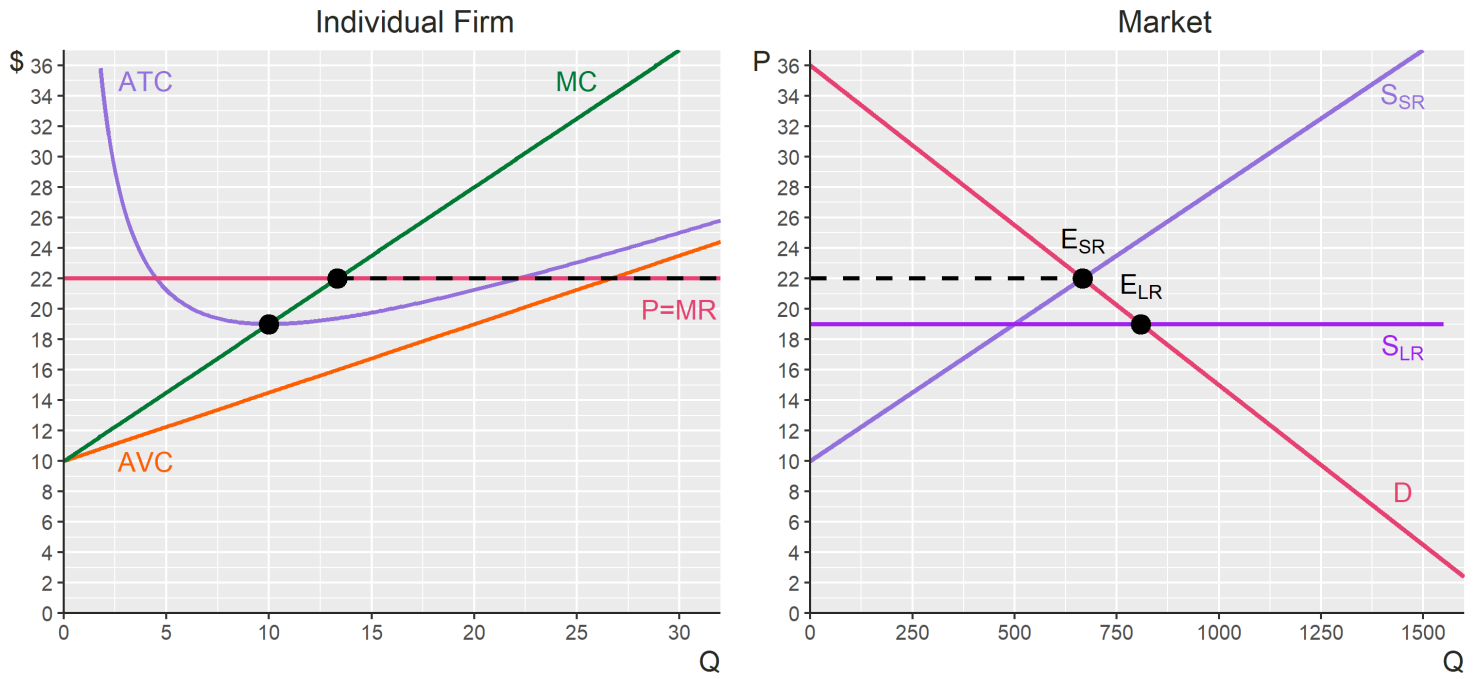
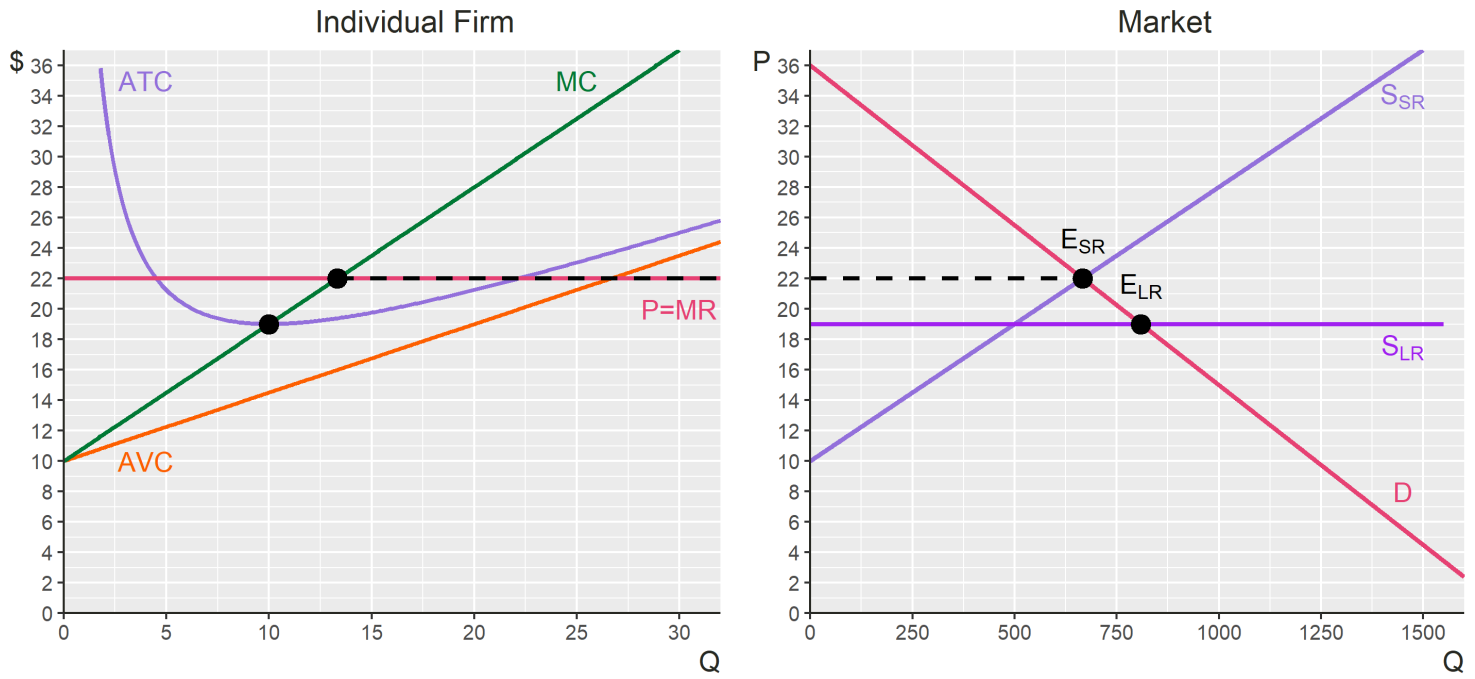


- In the short run, firms are making positive profits, so more firms enter and drive the price down

Equilibria



- In the short run, firms are making positive profits, so more firms enter and drive the price down
- In the long run, we are back to 0 profit

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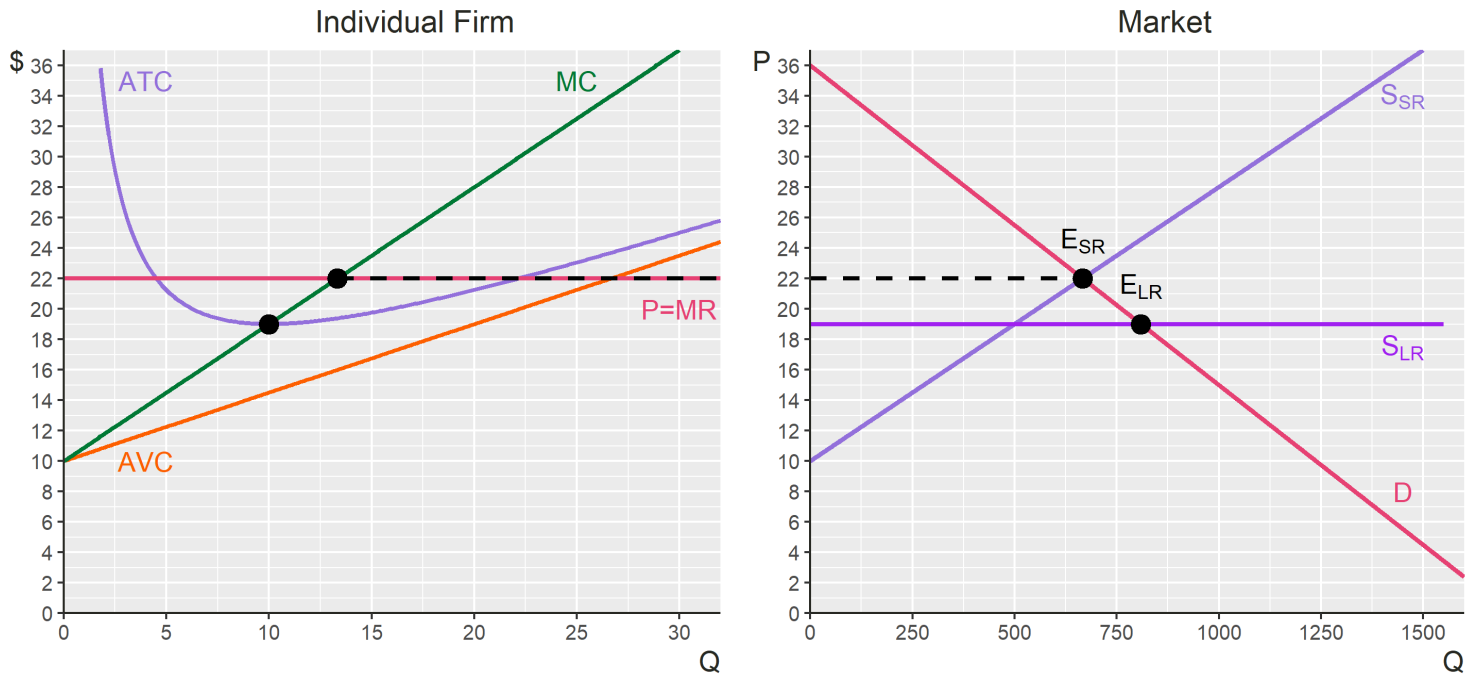
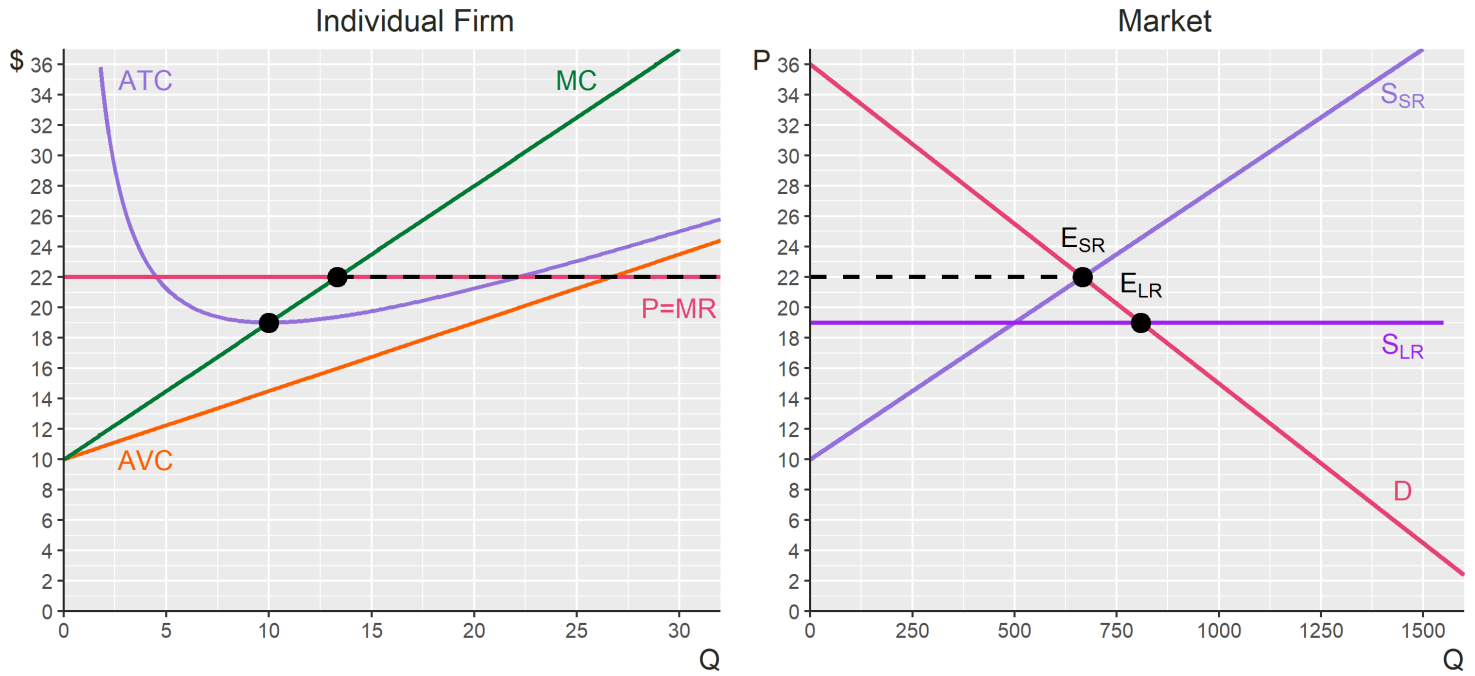


- In the short run, firms are making positive profits, so more firms enter and drive the price down
- In the long run, we are back to 0 profit
- Exactly how many firms are there in the long run?

Determining Number of Firms



- Recall: to determine the number of firms, we just have to know how much each firm is producing, and the market quantity produced

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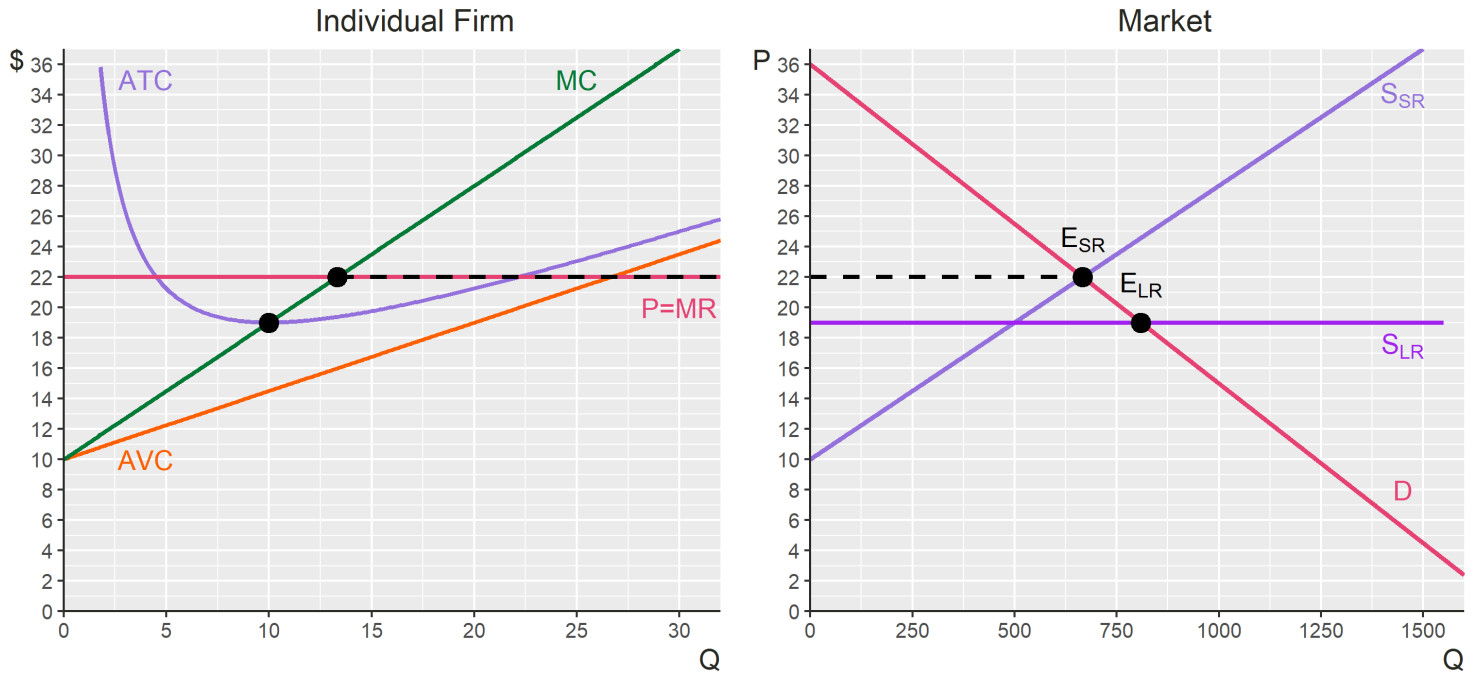

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- Example: In the above diagram, each firm is making about 13.33 units in the short run, and the market is making about 666.66

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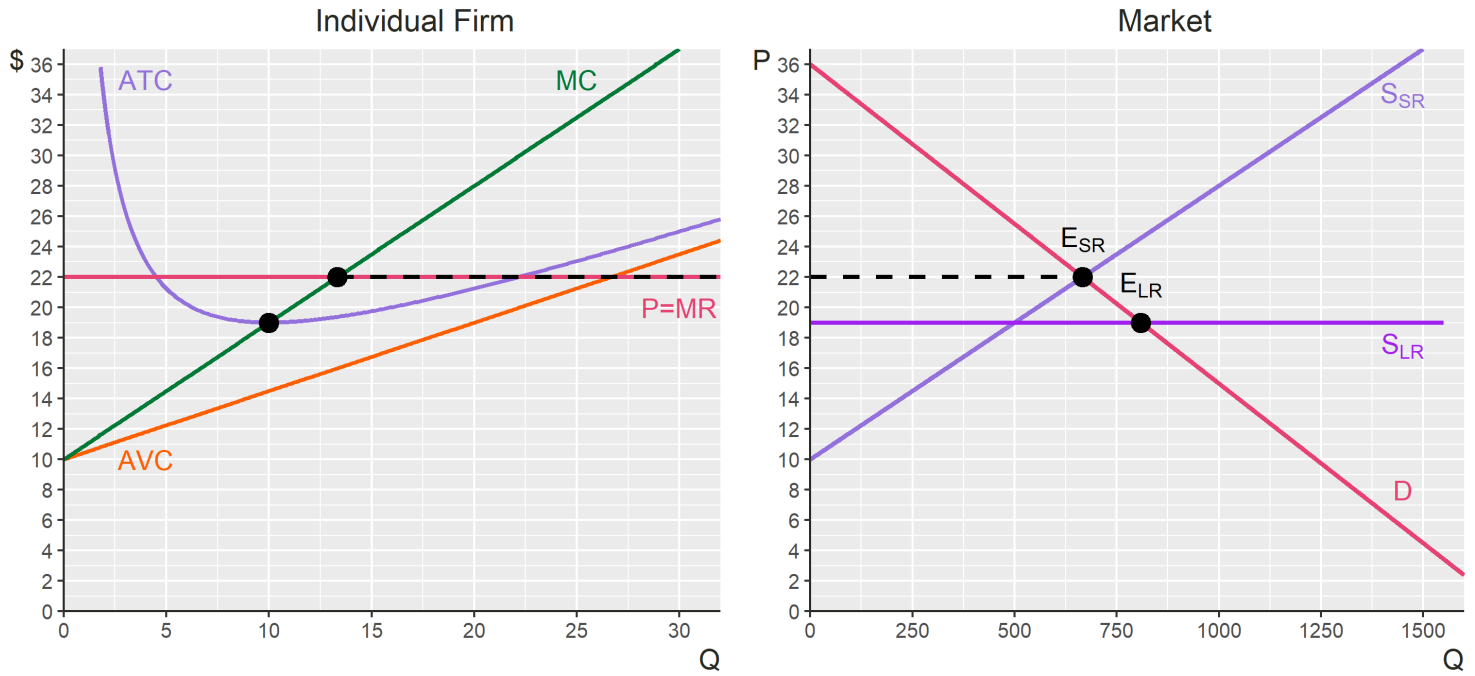
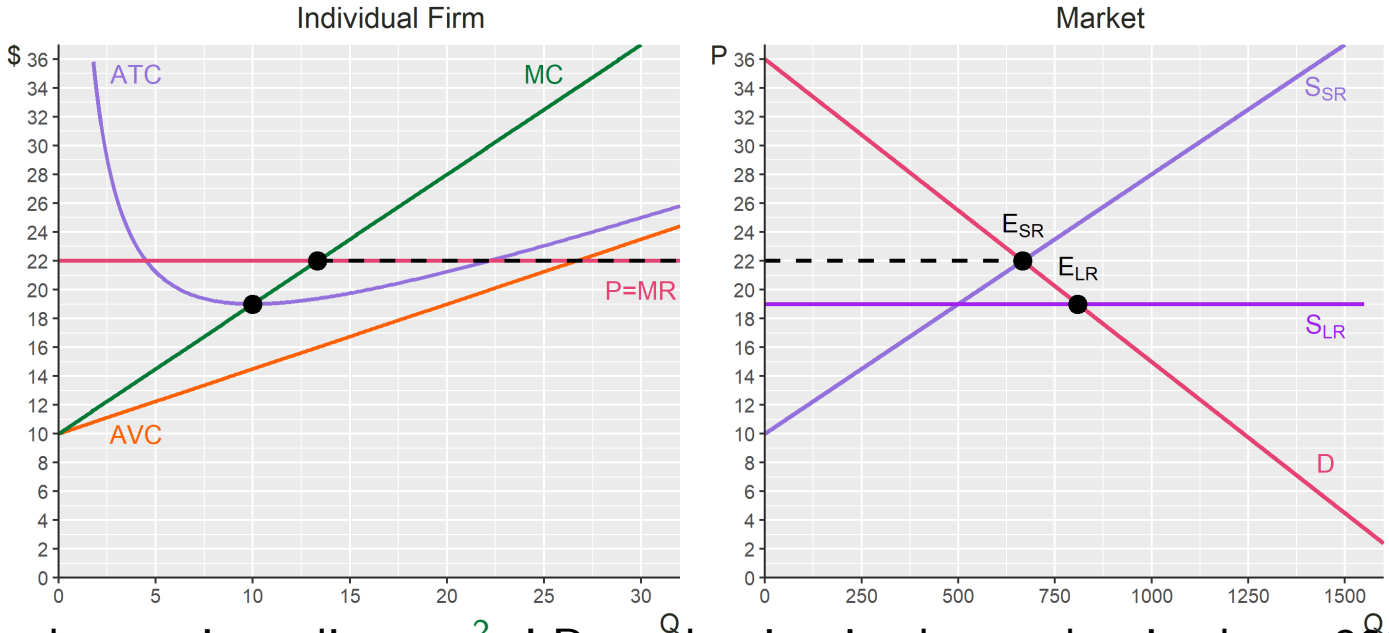


- Recall: to determine the number of firms, we just have to know how much each firm is producing, and the market quantity produced
- Example: In the above diagram, each firm is making about 13.33 units in the short run, and the market is making about 666.66
  - As a check: $666.6\bar{6}/13.\bar{3} = 50$, which is the number of firms we started with (i.e., the number of firms in the SR)

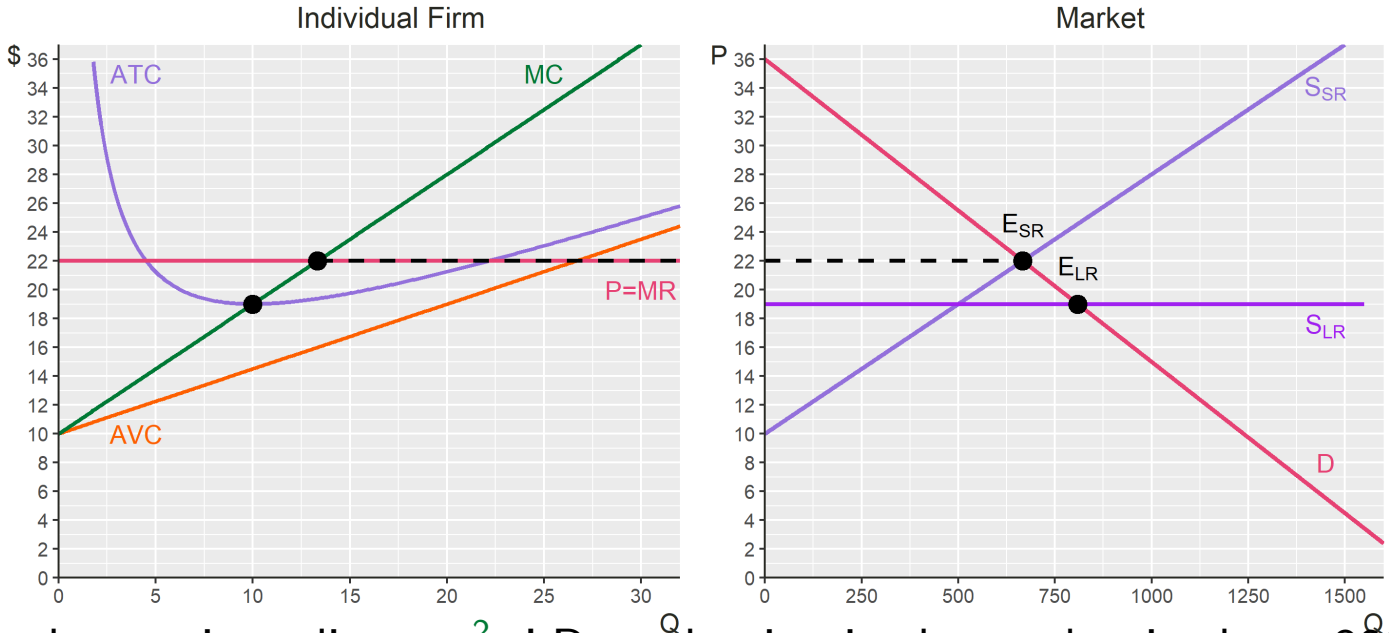
Determining Number of Firms in the LR



- In the previous diagram[2], LR production in the market is about 809.524. How much does each firm produce?

[2] Here, I have the numbers, so I am just giving them to you. Given an easier-to-eyeball diagram, you should be able to identify this number

Determining Number of Firms in the LR



- In the previous diagram[2], LR production in the market is about 809.524. How much does each firm produce?
  - Looking at the zero-profit point, it is 10

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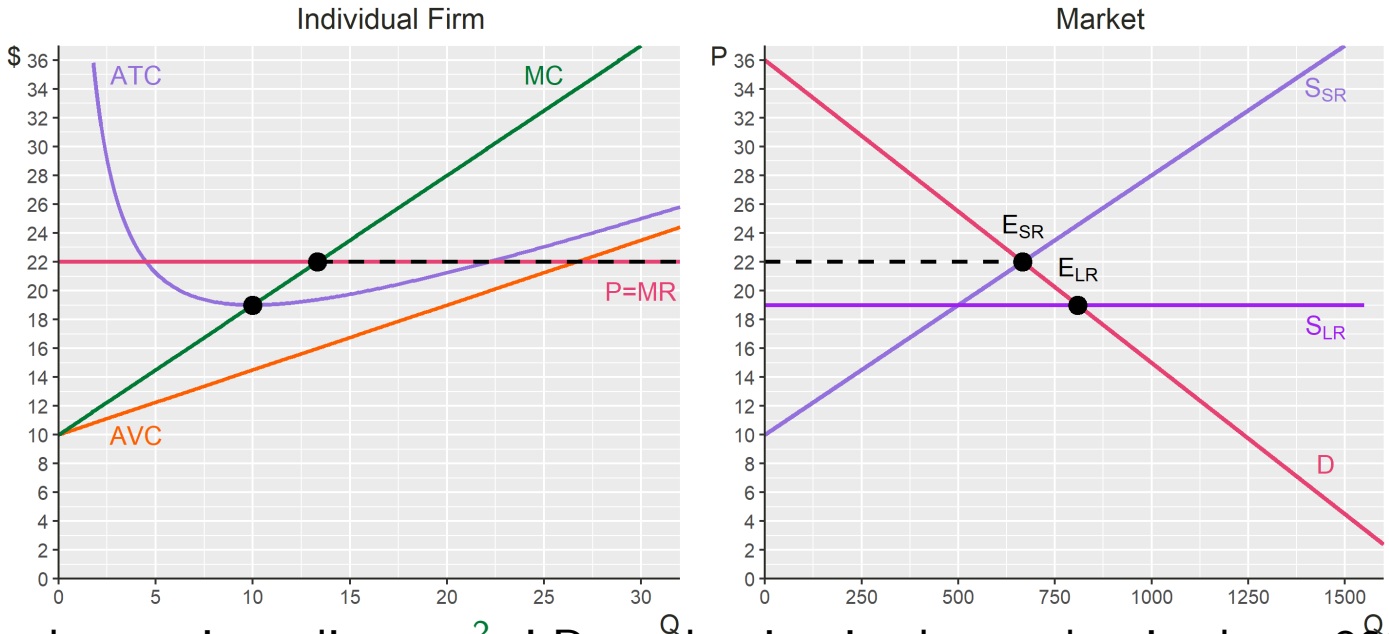
Determining Number of Firms in the LR



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  - Therefore, the number of firms in long run is

$$809.524/10 \approx 80.9 \approx 81$$

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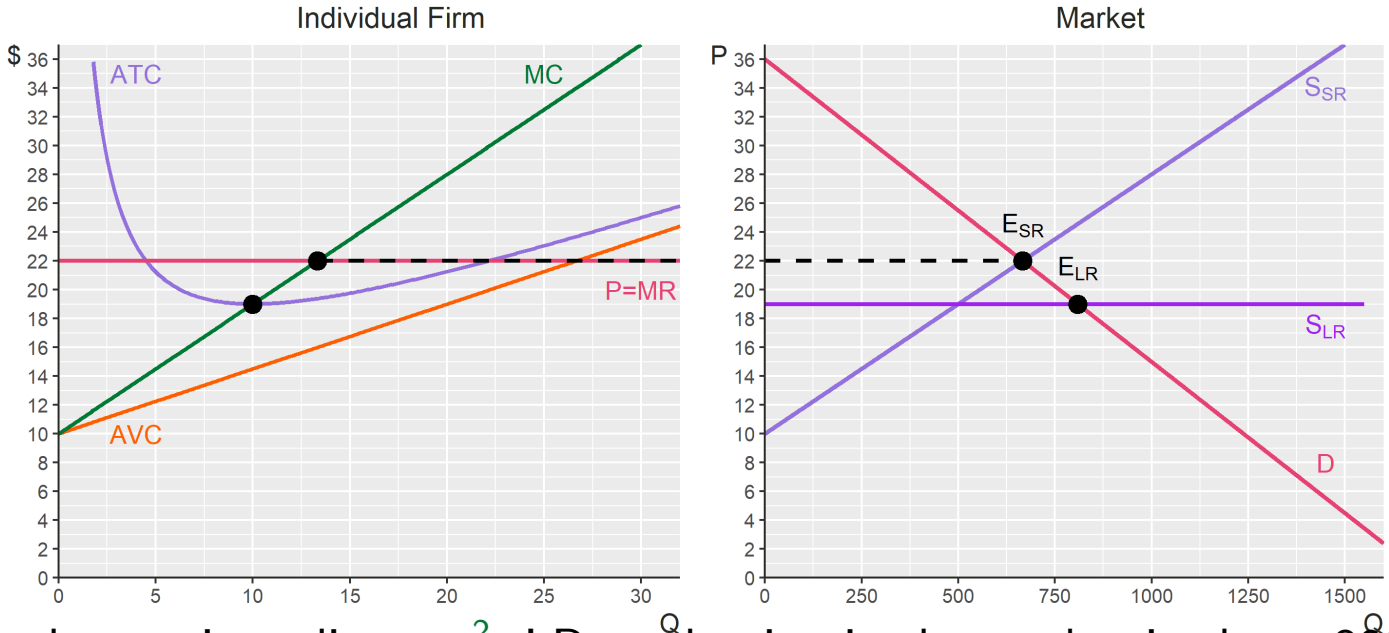

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- So, there are 81 firms in the long run

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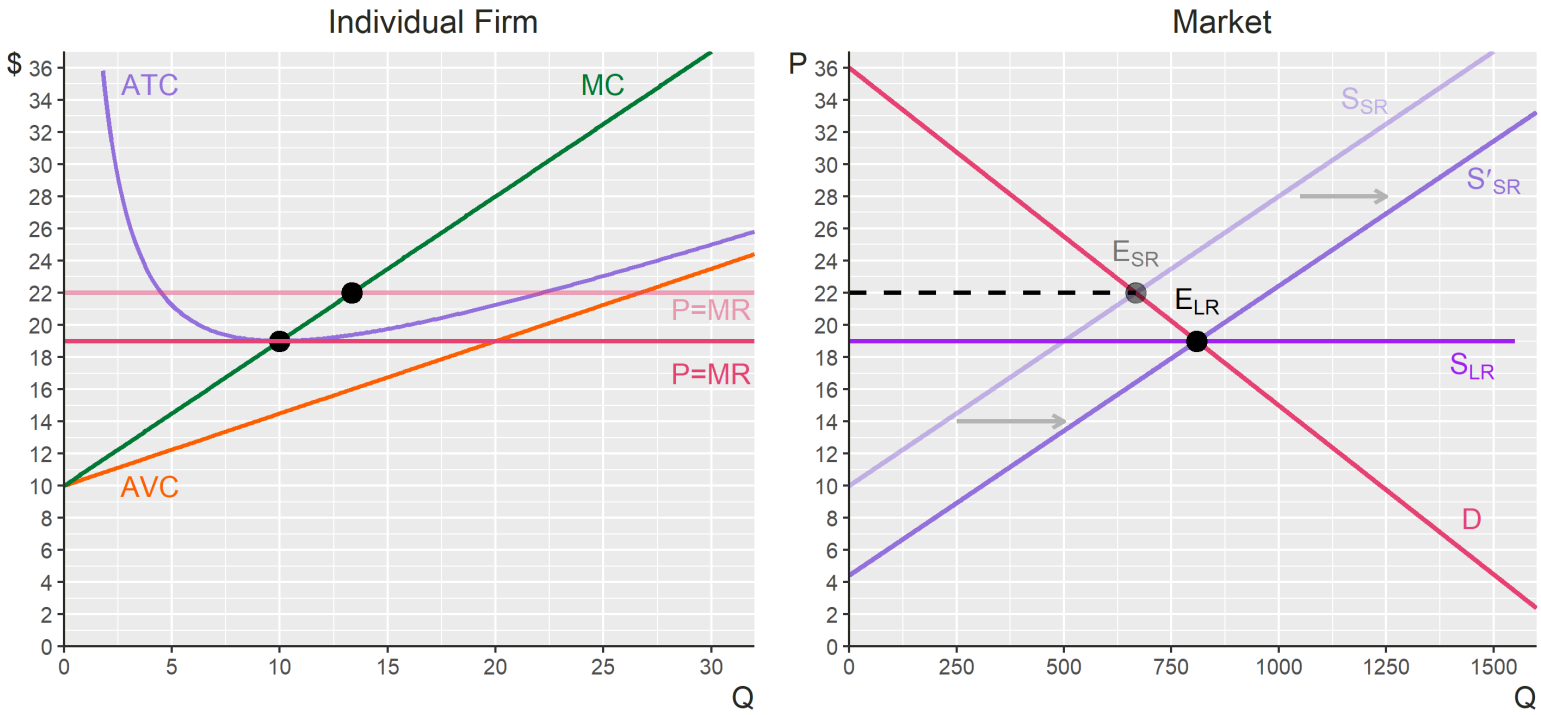
Affects of this Demand Curve

- Visually, this is what happens as we transition from the short to the long run:



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- Feel free to email me with questions next week if you are feeling hazy, or set up a meeting

How the Book Derives Optimal Profit for the Firm

- The book carries out this discussion much differently than I have
- I expect you to read chapter 14 on your own, to further your understanding, and possibly gain more insights
- In addition to a difference in presentation style and order, I did not cover material from 14-2d or 14-3d, so read those on your own (particularly 14-3d)
- Also, whatever we didn't get to in class today is your responsibility to review on your own