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Lecture 1: Supply and Demand

August 29, 2023

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Overview

Course Administration

Supply and Demand

Market and Models

Demand

Supply

Market Equilibrium

Welcome to Microeconomics

1. Expectations
    - Call me Leah
    - Class should be hard, but not impossible
    - What we learn should be clearly applicable
    - Come prepared to give examples, as I will call on you
    - Understand that no class can satisfy all students
    - Is this the right class for you?
    - Math assessment
    - If you have a disability requiring accommodation, please let me know this week

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2. Say hello to TA Huang Chen

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5. Ripped from Headlines Assignment

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Welcome to Microeconomics

			December			
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

- Last class Dec. 5
- First exam date Dec. 13
- Last exam date Dec. 19
- Can we agree earlier?

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Expectations for Class

Before Class

- Read assigned textbook pages
- Read ripped from headlines articles
- Work on problem set

Expectations for Class

Before Class

- Read assigned textbook pages
- Read ripped from headlines articles
- Work on problem set

During Class
We are recording! For within class use **only**

Expectations for Class

Before Class

- Read assigned textbook pages
- Read ripped from headlines articles
- Work on problem set

During Class

We are recording! For within class use **only**

- Administrative notes
- Ripped from the Headlines presentation
- Interactive lecture

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Chapters 1 and 2

1. Why Economics?
2. Supply and Demand
   - Markets and Models
   - Demand
   - Supply
   - Market Equilibrium

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Why Economics?

- An important language for policy makers
- A shared set of assumptions about how the world works
- Understand the assumptions and logic if you want to challenge it
- Learn the power of models

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Markets and Models:
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What is a Market?

A set of many things

- type of product sold
- location
- point in time

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Markets Policy Aside: Antitrust

- Federal anti-trust policy prohibits monopolies and "excessive" market concentration
- Whether or not a market is concentrated depends on how you define the market
- Expedia / Orbitz propsed merger
  - Expedia owns Travelocity, wants to buy Orbitz
  - Hotel owners say market is online bookings, and merger would give new company 75% of all online bookings
  - Expedia says market is hotel reservations, and merged company will account for 17% of hotel bookings[1]

---

[1]Full story here and a different interesting example here.

Key Assumptions of Supply and Demand Model

1. We restrict our focus to one single market
   Supply $\equiv$ total amount of a good that all producers are willing to sell
   Demand $\equiv$ total amount of a good that all consumers are willing to buy
2. All goods bought and sold in the market are identical
3. All goods sold in the market sell for the same prices and everyone has the same information about prices and quality
4. There are many buyers and sellers in the market

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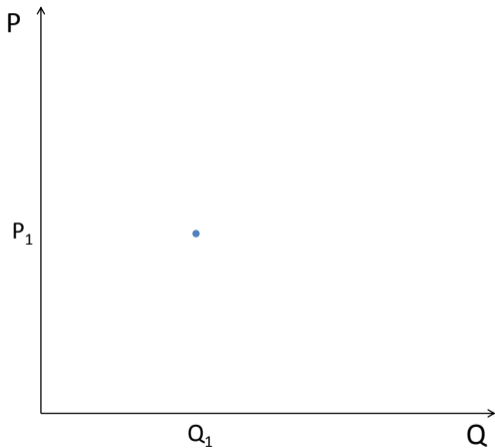○●○○○○○○○○○○○○○

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Demand Curves

We want a way to summarize everyone's demand in the market

- Demand curve ≡ relationship between the quantity of a good demanded and the price consumers are willing to pay, holding all else constant
- Demand curves almost always slope downward

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Picturing Demand for a Product You Know
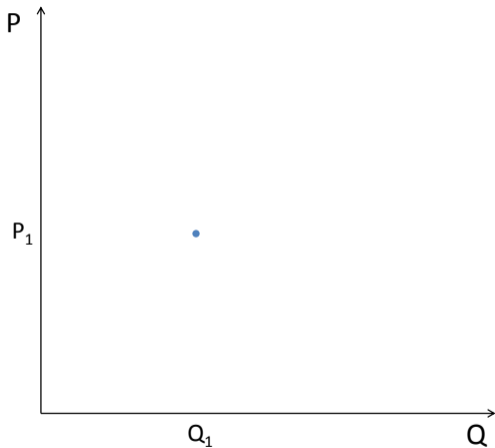
Picturing Demand for a Product You Know

Then, what if the price increases?

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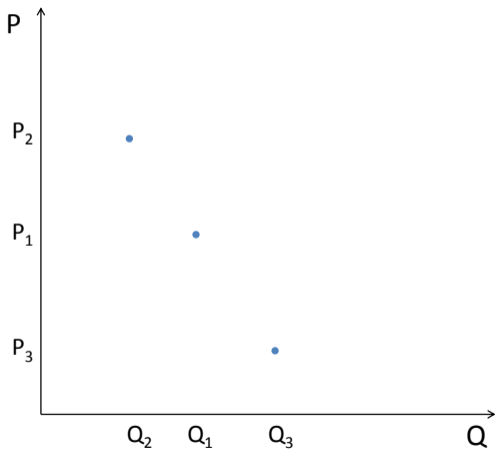
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Quantity Demanded at an Increased Price

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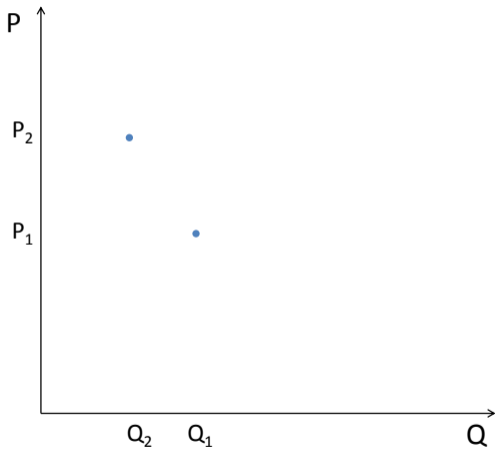
Quantity Demanded at an Increased Price
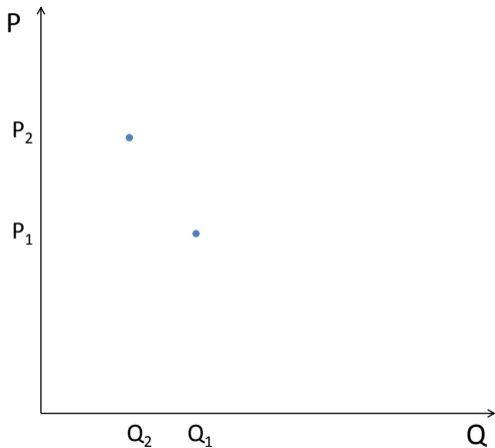
What if the price had instead decreased?

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Quantity Demanded at a Decreased Price

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Think about a Q for any P

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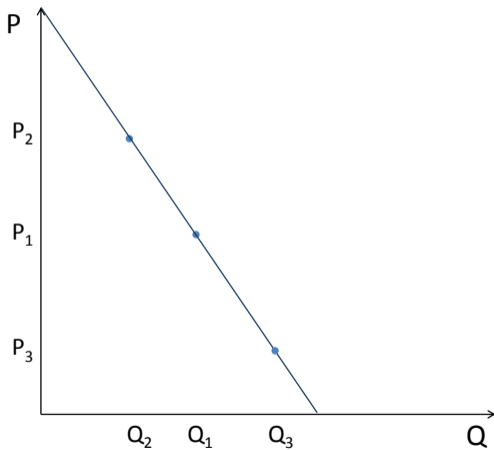
The Textbook's Demand Curve
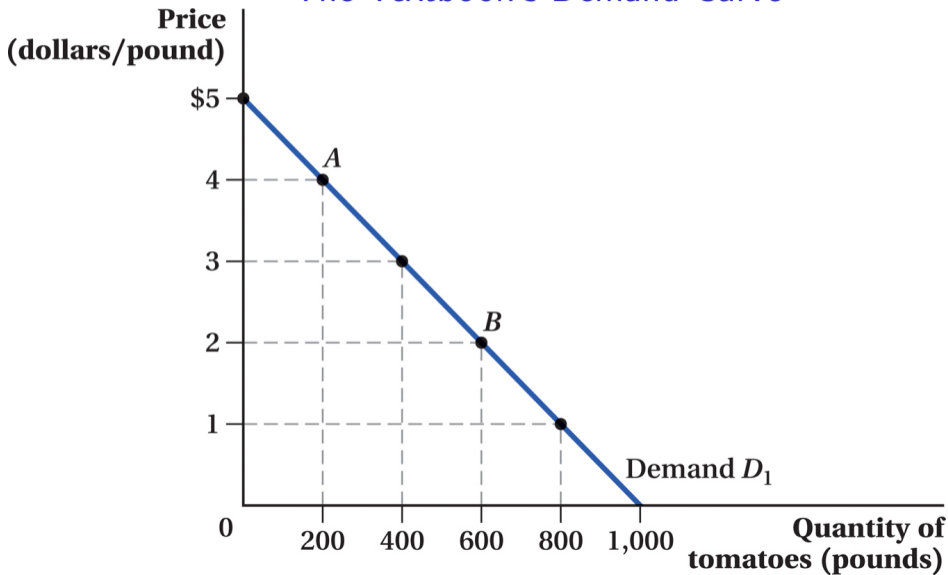
Demand Curve: Graph to Algebra

- If you can draw it in a graph, you can write an equation for it
- We can write the previous picture's line as $Q^D = 1000 - 200P$
  - This is a function of Q in terms of P, which we can write in general as $Q = f(P)$

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Inverse Demand Curve

$$Q^D = 1000 - 200P$$

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Inverse Demand Curve

$$
\begin{aligned}
Q^D &= 1000 - 200P \\
Q^D + 200P &= 1000
\end{aligned}
$$

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Inverse Demand Curve

$$
\begin{aligned}
Q^D &= 1000 - 200P \\
Q^D + 200P &= 1000 \\
200P &= 1000 - Q^D
\end{aligned}
$$

Inverse Demand Curve

$$
\begin{aligned}
Q^D &= 1000 - 200P \\
Q^D + 200P &= 1000 \\
200P &= 1000 - Q^D \\
P &= 5 - \frac{1}{200}Q^D
\end{aligned}
$$

Inverse Demand Curve

$$
\begin{aligned}
Q^D &= 1000 - 200P \\
Q^D + 200P &= 1000 \\
200P &= 1000 - Q^D \\
P &= 5 - \frac{1}{200}Q^D
\end{aligned}
$$

- First line is demand curve
- Final line is inverse demand curve: function of P in terms of Q
- Inverse version matches the previous graph
- You can read the negative slope $\left(-\frac{1}{200}\right)$ from the equation

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Factors that Influence Demand

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Factors that Influence Demand

1. Price
2. Number of consumers
3. Consumer income or wealth
4. Consumer tastes
5. Prices of other goods

How Do Other Goods Influence the Price of the Good We're Considering?

- Substitute $\equiv$ a good that could replace the good under consideration

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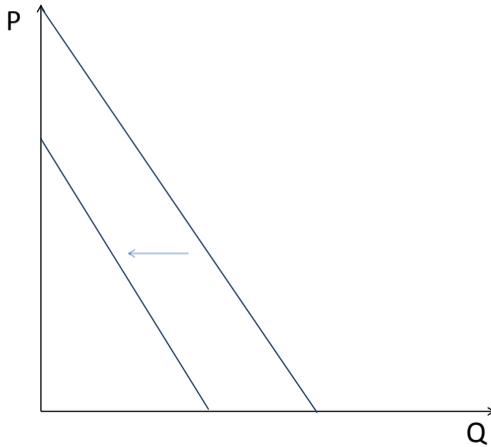## How Do Other Goods Influence the Price of the Good We're Considering?

- Substitute $\equiv$ a good that could replace the good under consideration
- Complement $\equiv$ a good that you consume with the good under consideration

If the price of a perfect substitute decreases, what happens to your demand for the main good?

Demand Curve Shifts

- If we want to understand how the market demand changes when price changes, we move **along** the demand curve
- When there is a change in any other determinant of demand, the demand curve **shifts**

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What Could Make a Demand Curve Shift Inward?

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Key Language: Change in Demand vs Change in Quantity Demanded

- Change in quantity demanded

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Key Language: Change in Demand vs Change in Quantity Demanded

- Change in quantity demanded
    - Movement **along** the demand curve
    - Nothing changes but price

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Key Language: Change in Demand vs Change in Quantity Demanded

- Change in quantity demanded
  - Movement **along** the demand curve
  - Nothing changes but price
- Change in demand

Key Language: Change in Demand vs Change in Quantity Demanded

- Change in quantity demanded
  - Movement **along** the demand curve
  - Nothing changes but price
- Change in demand
  - **Shift** of the demand curve
  - The overall relationship between price and quantity changes

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Key Language: Change in Demand vs Change in Quantity Demanded

- Change in quantity demanded
    - Movement **along** the demand curve
    - Nothing changes but price
- Change in demand
    - **Shift** of the demand curve
    - The overall relationship between price and quantity changes

Same wording applies to supply. Use carefully!

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Factors that Influence Supply

Factors that Influence Supply

- Price
- Suppliers' costs of production
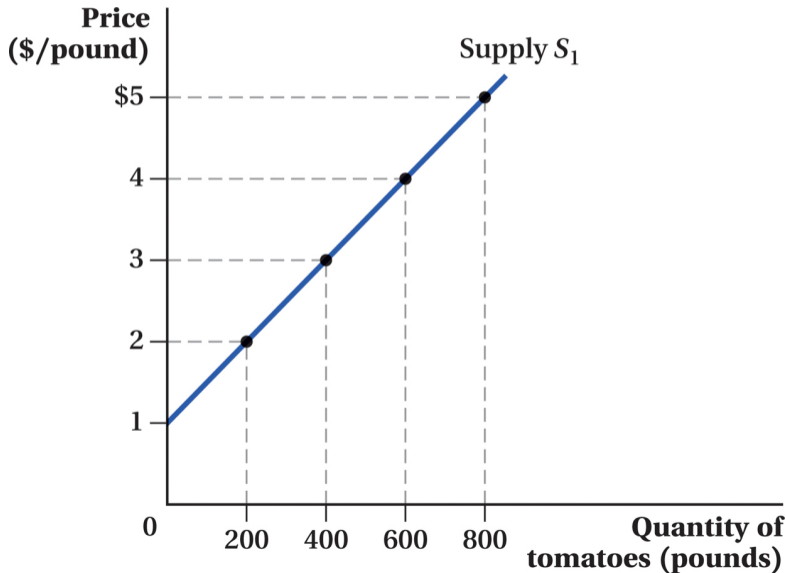- Number of sellers
- Sellers' outside options

Factors that Influence Supply

- Price
- Suppliers' costs of production
- Number of sellers
- Sellers' outside options

So what does a supply curve look like?

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Factors that Influence Supply

- Price
- Suppliers' costs of production
- Number of sellers
- Sellers' outside options

So what does a supply curve look like? Upward sloping.

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Textbook's Supply Curve

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An Equation for the Supply Curve

- Just like demand, we can write an equation for supply
- $Q^S = 200P - 200$

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An Equation for the Supply Curve

- Just like demand, we can write an equation for supply
- $Q^S = 200P - 200$
    - this is $Q = f(P)$

An Equation for the Supply Curve

- Just like demand, we can write an equation for supply
- $Q^S = 200P - 200$
    - this is $Q = f(P)$
- We can also write $P = \frac{Q}{200} + 1$
    - this is $P = g(Q)$
    - entirely equivalent to first equation

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Shifts in the Supply Curve

- Does a price change shift the supply curve or move along the supply curve?

Shifts in the Supply Curve

- Does a price change shift the supply curve or move along the supply curve?
- Do non-price changes cause shifts or moves along the supply curve?

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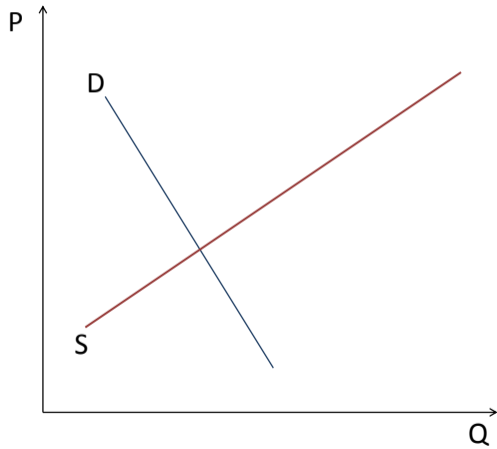
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Market Equilibrium

Defining Market Equilibrium

- Point at which consumers' quantity demanded equals producers' quantity supplied
  - $Q^D = Q^S$
- Equilibrium price $\equiv$ price at which quantity supplied equals quantity demanded
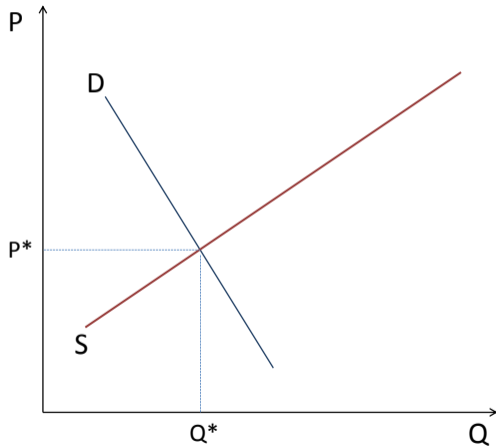 - P such that $Q^D = Q^S$

Defining Market Equilibrium

- Point at which consumers' quantity demanded equals producers' quantity supplied
  - $Q^D = Q^S$
- Equilibrium price $\equiv$ price at which quantity supplied equals quantity demanded
  - P such that $Q^D = Q^S$
- Getting to equilibrium is the work of Adam Smith's invisible hand

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Equilibrium in a Graph

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Equilibrium in Algebra: Price

Using our tomato example

$$Q^D = Q^S$$

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Equilibrium in Algebra: Price

Using our tomato example

$$
\begin{aligned}
Q^D &= Q^S \\
1000 - 200P^* &= 200P^* - 200
\end{aligned}
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Equilibrium in Algebra: Price

Using our tomato example

$$
\begin{aligned}
Q^D &= Q^S \\
1000 - 200P^* &= 200P^* - 200 \\
1200 &= 400P^*
\end{aligned}
$$

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Equilibrium in Algebra: Price

Using our tomato example

$$
\begin{aligned}
Q^D &= Q^S \\
1000 - 200P^* &= 200P^* - 200 \\
1200 &= 400P^* \\
P^* &= 3
\end{aligned}
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Equilibrium in Algebra: Quantity

- Before putting pencil to paper, are Q^S and Q^D equal or different?

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Equilibrium in Algebra: Quantity

- Before putting pencil to paper, are Q^S and Q^D equal or different? They must be the same.

Equilibrium in Algebra: Quantity

- Before putting pencil to paper, are Q^S and Q^D equal or different? They must be the same.
- How do you find them?
- Using our tomato example

$$Q^{D*} \;=\; 1000 - 200P^*$$

Equilibrium in Algebra: Quantity

- Before putting pencil to paper, are Q^S and Q^D equal or different? They must be the same.
- How do you find them?
- Using our tomato example

$$
\begin{aligned}
Q^{D*} &= 1000 - 200P^* \\
&= 1000 - 200(3) \\
&= 400
\end{aligned}
$$

Equilibrium in Algebra: Quantity

- Before putting pencil to paper, are Q^S and Q^D equal or different? They must be the same.
- How do you find them?
- Using our tomato example

$$
\begin{aligned}
Q^{D*} &= 1000 - 200P^* \\
&= 1000 - 200(3) \\
&= 400
\end{aligned}
\qquad\qquad
\begin{aligned}
Q^{S*} &= 200P^* - 200
\end{aligned}
$$

Equilibrium in Algebra: Quantity

- Before putting pencil to paper, are Q^S and Q^D equal or different? They must be the same.
- How do you find them?
- Using our tomato example

$$
\begin{aligned}
Q^{D*} &= 1000 - 200P^* \\
&= 1000 - 200(3) \\
&= 400
\end{aligned}
\qquad\qquad
\begin{aligned}
Q^{S*} &= 200P^* - 200 \\
&= 200(3) - 200
\end{aligned}
$$

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\begin{aligned}
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&= 200(3) - 200 \\
&= 400
\end{aligned}
$$

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Getting to Equilibrium

That's just the math. The magic is getting there!

- Suppose we are out of equilibrium and $Q^D > Q^S$

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- Suppose we are out of equilibrium and $Q^D > Q^S$
  - Seems like a shortage
  - Price increases until we reach equilibrium
- Suppose we are out of equilibrium and $Q^S > Q^D$

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Getting to Equilibrium

That's just the math. The magic is getting there!

- Suppose we are out of equilibrium and $Q^D > Q^S$
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- Suppose we are out of equilibrium and $Q^S > Q^D$
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    - Price falls until we reach equilibrium

Getting to Equilibrium

That's just the math. The magic is getting there!

- Suppose we are out of equilibrium and $Q^D > Q^S$
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  - Price increases until we reach equilibrium
- Suppose we are out of equilibrium and $Q^S > Q^D$
  - Seems like a surplus
  - Price falls until we reach equilibrium
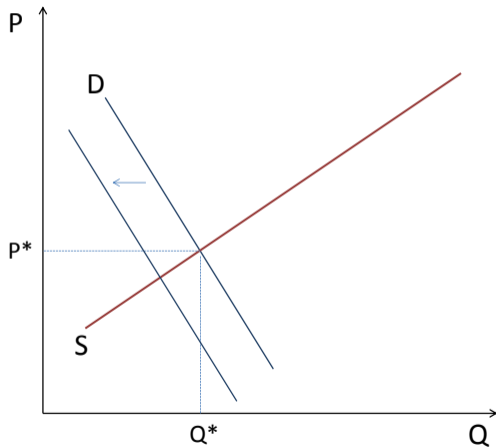
Note that these are all movements along existing curves.

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Impact of Shift in Demand

- Suppose that we learn that tomatoes ruin the fluoride on your teeth
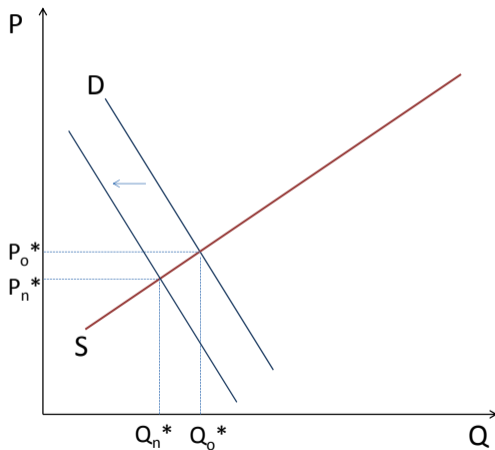- What happens to the demand curve?

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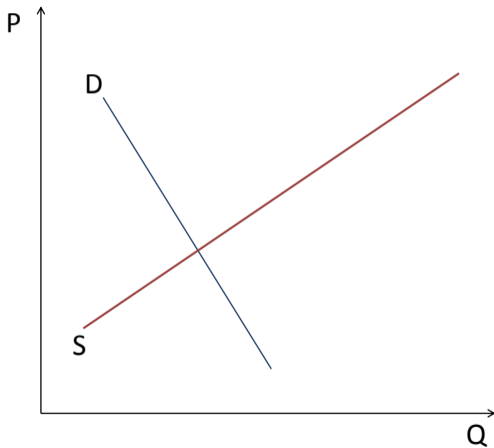
Where Does Demand Curve Go?

Where Does Demand Curve Go?

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Where Does Demand Curve Go?

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What does this mean for equilibrium?
New Demand Curve

- Assume that for any price, the quantity demanded of tomatoes falls by 500
- $Q^{D,original} = 1000 - 200P$

$$Q^{D,new} =$$

What does this mean for equilibrium?
New Demand Curve

- Assume that for any price, the quantity demanded of tomatoes falls by 500
- $Q^{D,original} = 1000 - 200P$

$$Q^{D,new} = Q^{D,original} - 500$$

What does this mean for equilibrium?
New Demand Curve

- Assume that for any price, the quantity demanded of tomatoes falls by 500
- $Q^{D,original} = 1000 - 200P$

$$
\begin{aligned}
Q^{D,new} &= Q^{D,original} - 500 \\
&= 1000 - 200P - 500
\end{aligned}
$$

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What does this mean for equilibrium?

Find new equilibrium

As before, set $Q^S = Q^{D,new}$

$$Q^S \;=\; Q^{D,new}$$

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Find new equilibrium

As before, set $Q^S = Q^{D,new}$

$$
\begin{aligned}
Q^S &= Q^{D,new} \\
200P^* - 200 &= 500 - 200P^*
\end{aligned}
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Find new equilibrium

As before, set $Q^S = Q^{D,new}$

$$
\begin{aligned}
Q^S &= Q^{D,new} \\
200P^* - 200 &= 500 - 200P^* \\
P^* &= 1.75
\end{aligned}
$$

Find equilibrium quantities, first $Q^{D,new}$

$$
\begin{aligned}
Q^{D*,new} &= 500 - 200P^* \\
&= 500 - 200(1.75)
\end{aligned}
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We find

- Price falls
- Equilibrium quantity falls

For Next Class

- Do problem set 1
- Work with classmates, me or TA on problems
- Sign up for Ripped from Headlines
- Article finders email me by Wednesday midnight
- Read Chapter 2.5

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I will

- post these lecture notes on my webpage
- post lecture recording on Blackboard
- anything else?