

Lecture 5: Individual and Market Demand

September 26, 2023

Course Administration

1. Readings for next class are in reading packet: tax incidence

Course Administration

1. Readings for next class are in reading packet: tax incidence
2. Use Numbers 2 of 3
 - Hopefully submitted
 - We'll discuss in class today
 - Use Numbers 3 of 3 coming Lecture 9
3. Problem set 5 posted

Course Administration

1. Readings for next class are in reading packet: tax incidence
2. Use Numbers 2 of 3
 - Hopefully submitted
 - We'll discuss in class today
 - Use Numbers 3 of 3 coming Lecture 9
3. Problem set 5 posted
4. Reminder: midterm October 18
 - Today's lecture and one more lecture before exam
 - Last year's midterm is posted
 - Midterm review time tentative 10/11, 7 to 8:30

Course Administration

1. Readings for next class are in reading packet: tax incidence
2. Use Numbers 2 of 3
 - Hopefully submitted
 - We'll discuss in class today
 - Use Numbers 3 of 3 coming Lecture 9
3. Problem set 5 posted
4. Reminder: midterm October 18
 - Today's lecture and one more lecture before exam
 - Last year's midterm is posted
 - Midterm review time tentative 10/11, 7 to 8:30
5. Any questions?

Ripped from the Headlines

As a reminder, next week

Finder	Presenter
Marissa T.	Yolanda H-A

Arizona – rescheduled you to Lecture 13!

How What You're Learning is Policy-Relevant

Ripped from Headlines presentation(s)

Finder	Presenter
Yolanda H-A	Arizona R.
Bridget M.	Eric W.

Big Ideas for This Lecture

- Where your demand curve comes from
- Where the market demand curve comes from
- Measuring demand – Use Numbers 2

Income and Changes in Consumption

Concepts from Last Class

- Utility
- Indifference curves
- Budget constraint
- Utility is maximized when

Concepts from Last Class

- Utility
- Indifference curves
- Budget constraint
- Utility is maximized when

$$MRS_{X,Y} = \frac{P_X}{P_Y}$$

$$\frac{MU_X}{MU_Y} = \frac{P_X}{P_Y}$$

How do Changes in Income Affect Consumption?

- Income effect \equiv change in consumption due to a change in income
- When income increases, what happens to
 - location of budget constraint?

How do Changes in Income Affect Consumption?

- Income effect \equiv change in consumption due to a change in income
- When income increases, what happens to
 - location of budget constraint? shifts outward
 - slope of budget constraint?

How do Changes in Income Affect Consumption?

- Income effect \equiv change in consumption due to a change in income
- When income increases, what happens to
 - location of budget constraint? shifts outward
 - slope of budget constraint? unchanged, since prices haven't changed
 - shape of indifference curves?

How do Changes in Income Affect Consumption?

- Income effect \equiv change in consumption due to a change in income
- When income increases, what happens to
 - location of budget constraint? shifts outward
 - slope of budget constraint? unchanged, since prices haven't changed
 - shape of indifference curves? nothing!

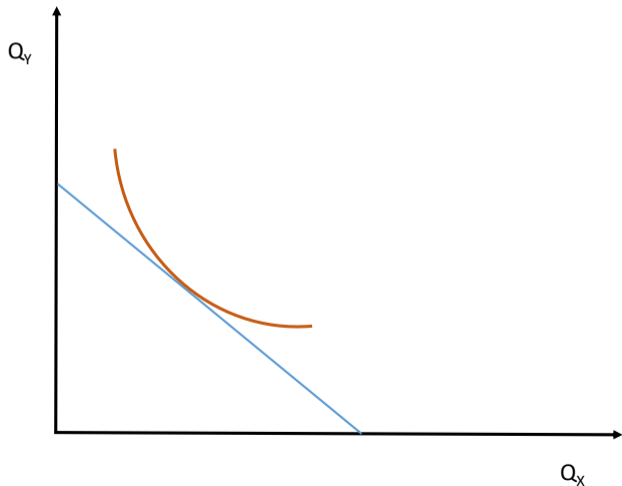
How do Changes in Income Affect Consumption?

- Income effect \equiv change in consumption due to a change in income
- When income increases, what happens to
 - location of budget constraint? shifts outward
 - slope of budget constraint? unchanged, since prices haven't changed
 - shape of indifference curves? nothing!
- Does utility increase or decrease?

How do Changes in Income Affect Consumption?

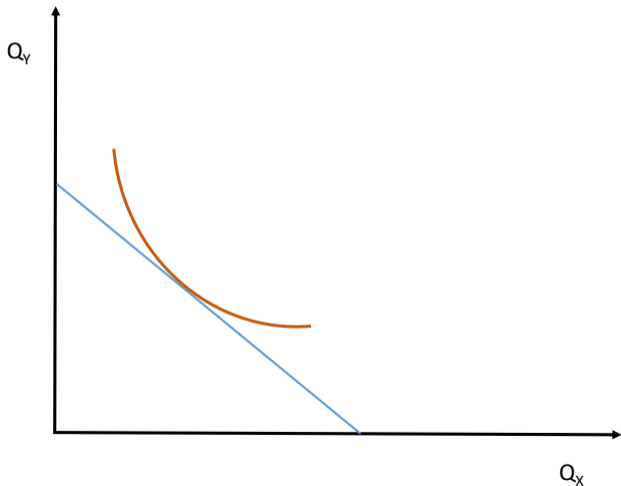
- Income effect \equiv change in consumption due to a change in income
- When income increases, what happens to
 - location of budget constraint? shifts outward
 - slope of budget constraint? unchanged, since prices haven't changed
 - shape of indifference curves? nothing!
- Does utility increase or decrease? at a minimum, does not decrease

Increasing Income and Resulting Utility



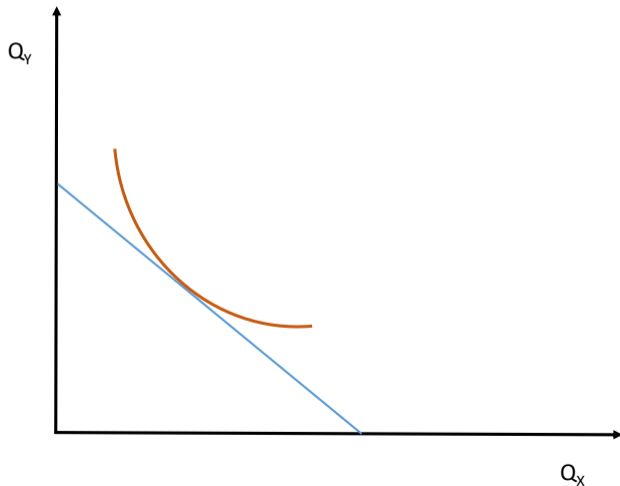
- What is the blue line?

Increasing Income and Resulting Utility



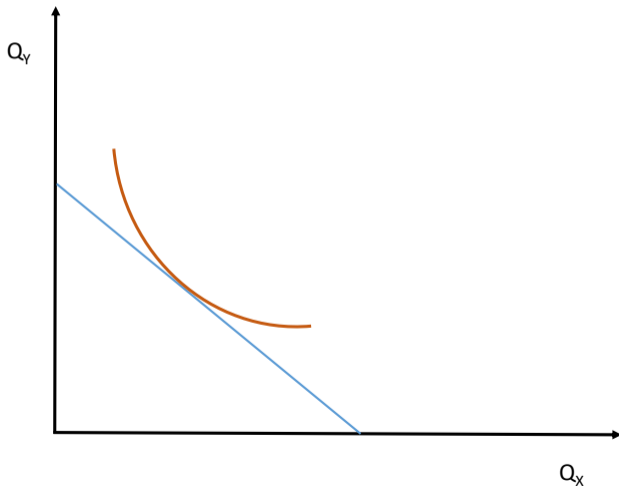
- What is the blue line?
- What is the orange line?

Increasing Income and Resulting Utility



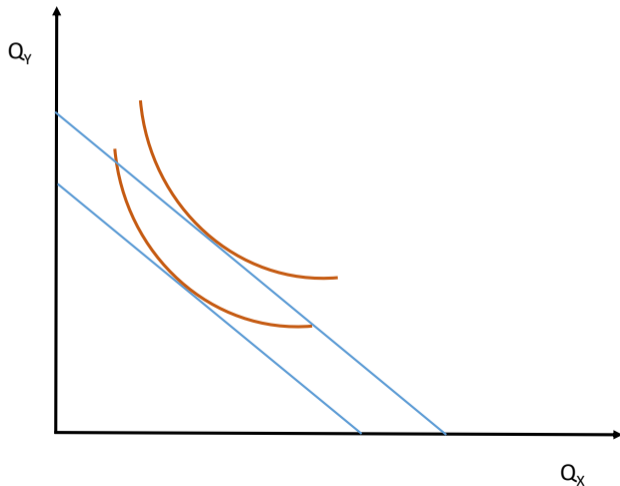
- What is the blue line?
- What is the orange line?
- What is true about the place where they touch?

Increasing Income and Resulting Utility



- What is the blue line?
- What is the orange line?
- What is true about the place where they touch?
- What happens if we increase income?

Increasing Income and Resulting Utility



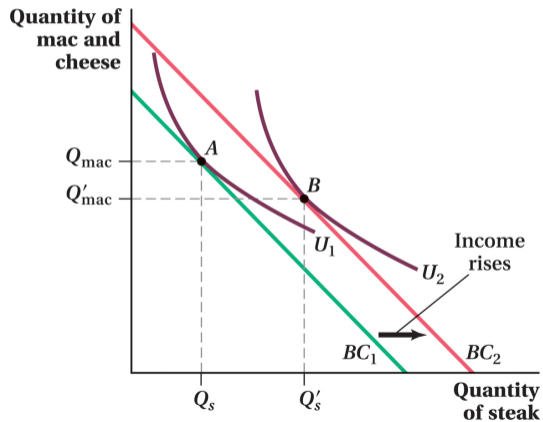
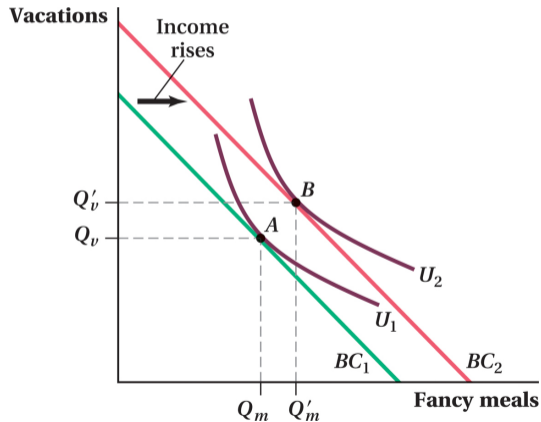
How do you see that utility can't decrease when income increases?

Reminder: Some definitions

- Normal good \equiv good for which consumption increases with income
- Inferior good \equiv good for which consumption decreases with income
- Whether a good is normal or inferior depends on your income. Example?

Normal and Inferior Goods in Pictures

Find the Inferior Good!



Income Elasticity and Types of Goods

$$E_I^D = \frac{\% \Delta Q}{\% \Delta I}$$

- Sign of E_I^D for inferior goods?

Income Elasticity and Types of Goods

$$E_I^D = \frac{\% \Delta Q}{\% \Delta I}$$

- Sign of E_I^D for inferior goods? $E_I^D < 0$
- Sign of E_I^D for normal goods?

Income Elasticity and Types of Goods

$$E_I^D = \frac{\% \Delta Q}{\% \Delta I}$$

- Sign of E_I^D for inferior goods? $E_I^D < 0$
- Sign of E_I^D for normal goods? $E_I^D > 0$

Income Elasticity and Types of Goods

$$E_I^D = \frac{\% \Delta Q}{\% \Delta I}$$

- Sign of E_I^D for inferior goods? $E_I^D < 0$
- Sign of E_I^D for normal goods? $E_I^D > 0$
 - necessity goods: $0 < E_I^D \leq 1$
 - luxury goods: $E_I^D > 1$
- $E_I^D = 0$: Income inelastic

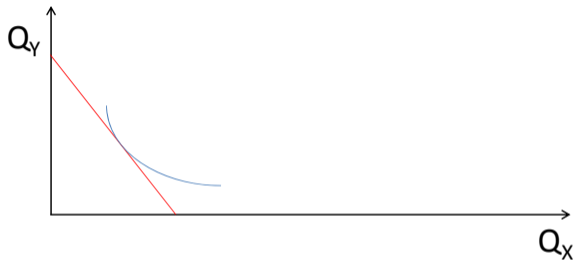
Note: Skipping income expansion path and Engel curves due to time constraints!

Your Demand Curve From First Principles

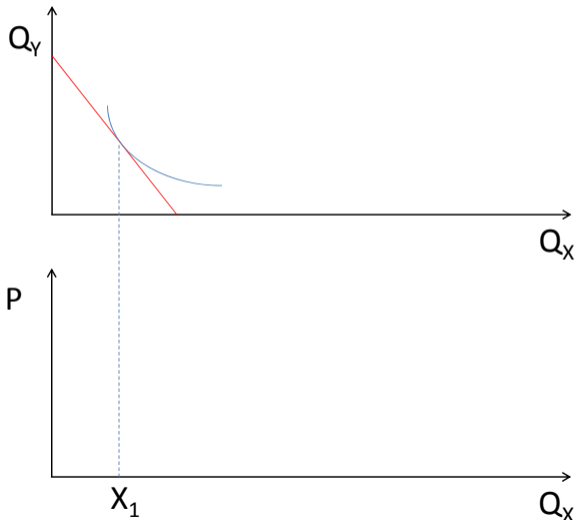
Using Income and Utility to Find Your Demand Curve

- Recall that a demand curve shows the quantity demanded at a given price
- In other words, what happens to consumption of X as price changes
- We now have the tools to figure this out for *you*
- We draw budget constraints and indifference curves in Y vs X , but we need a P vs X graph for demand

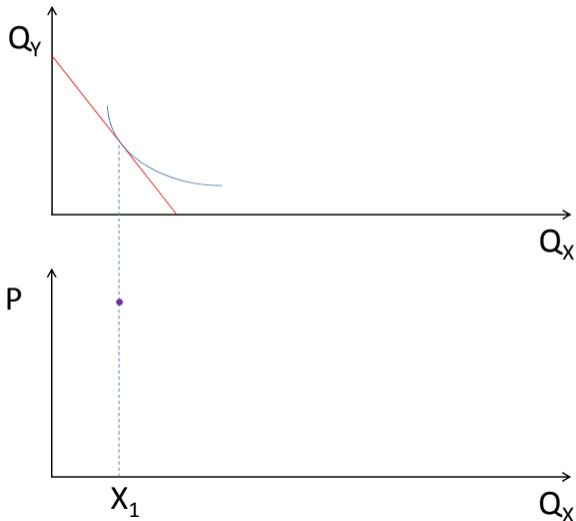
Using Income and Utility to Find Your Demand Curve



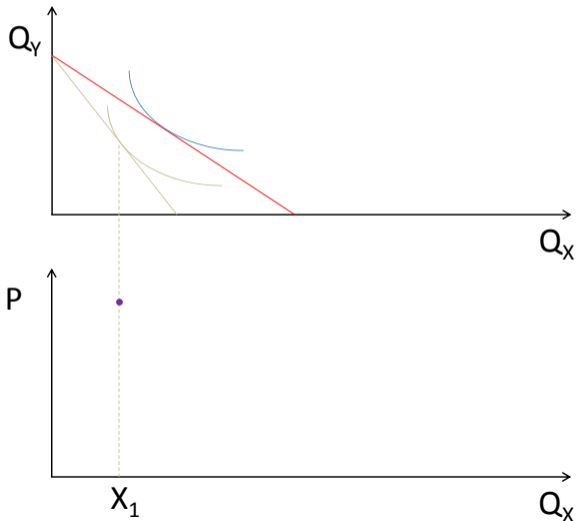
Using Income and Utility to Find Your Demand Curve



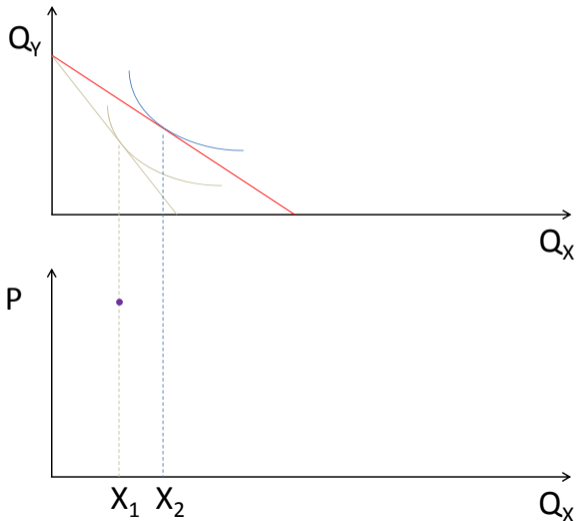
Using Income and Utility to Find Your Demand Curve



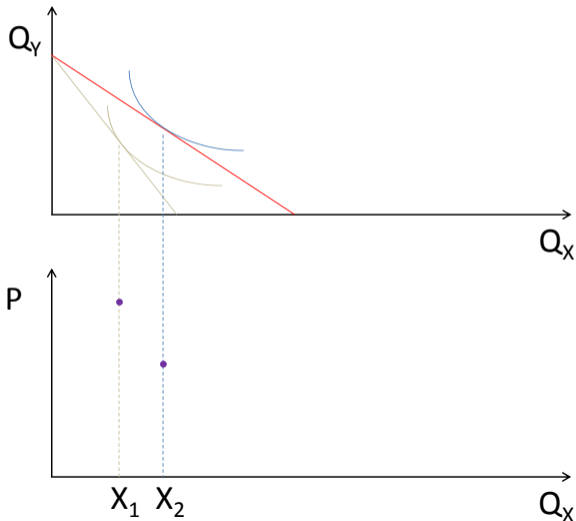
Using Income and Utility to Find Your Demand Curve



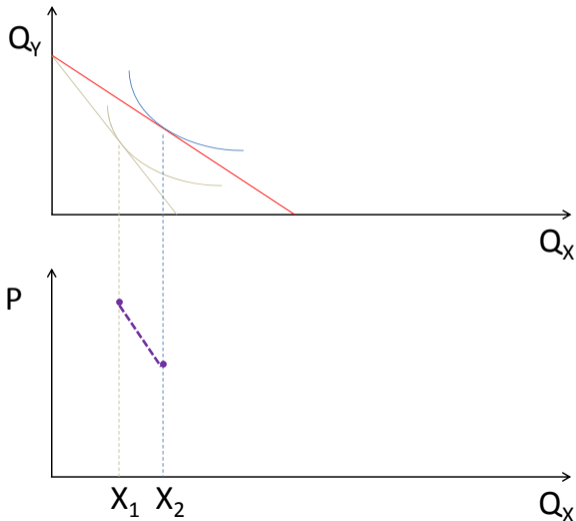
Using Income and Utility to Find Your Demand Curve



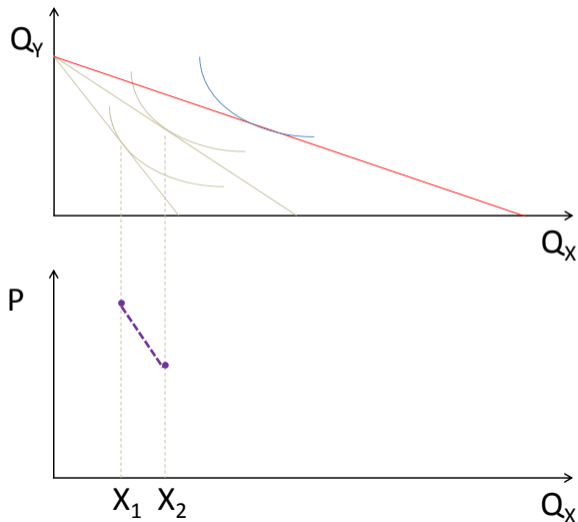
Using Income and Utility to Find Your Demand Curve



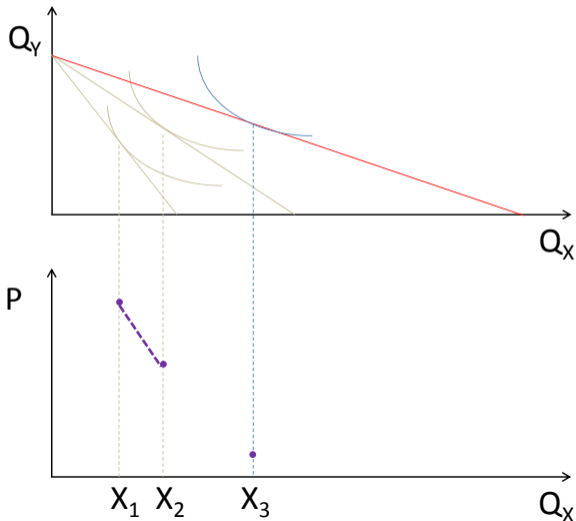
Using Income and Utility to Find Your Demand Curve



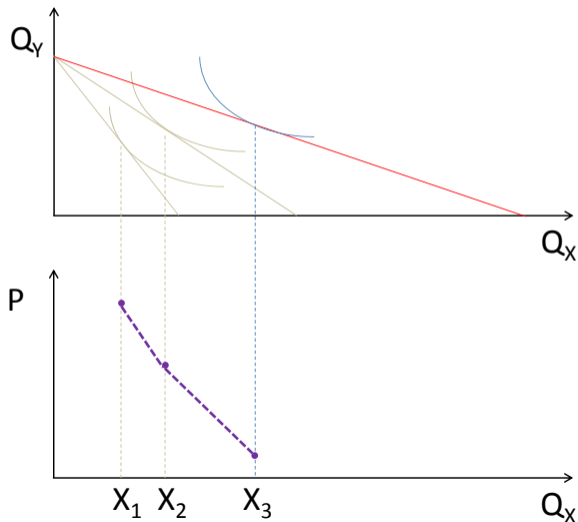
Using Income and Utility to Find Your Demand Curve



Using Income and Utility to Find Your Demand Curve



Using Income and Utility to Find Your Demand Curve



What Shifts Your Demand Curve?

What Shifts Your Demand Curve?

- Changes in price move us along the demand curve

What Shifts Your Demand Curve?

- Changes in price move us along the demand curve
- Changes in tastes or income or prices of other goods may shift the demand curve
- How would we change the preferences in the previous example?

Individual Demand and Market Demand

Finally, Getting to Market Demand!

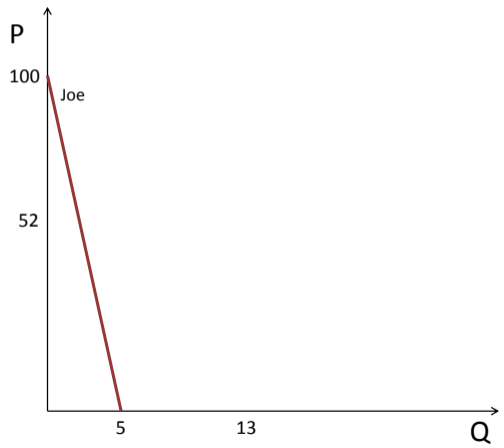
- Market demand is the sum of all individual demands
- Add individual demands **horizontally**
- For any price, add the quantities

Using Algebra To Do This

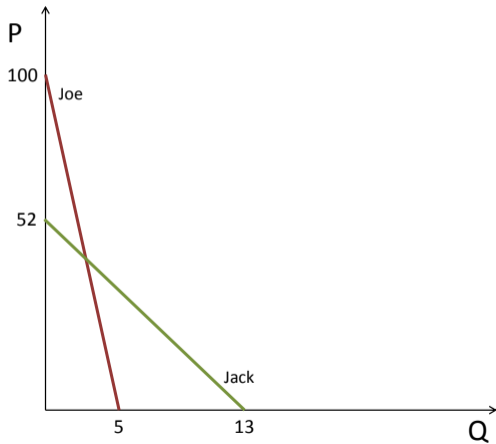
Suppose we have two demand curves

- $Q_{Joe} = 5 - 0.05P$
- $Q_{Jack} = 13 - 0.25P$

Joe's Demand in Pictures

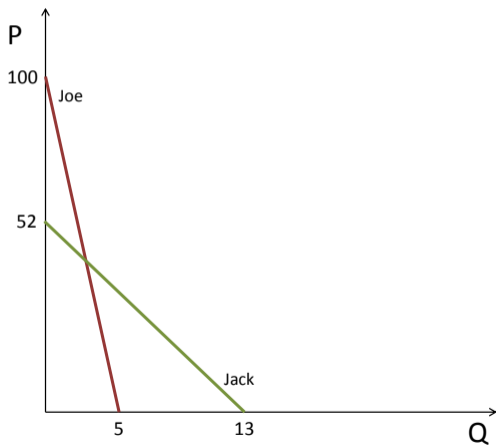


Joe and Jack's Demand In Pictures



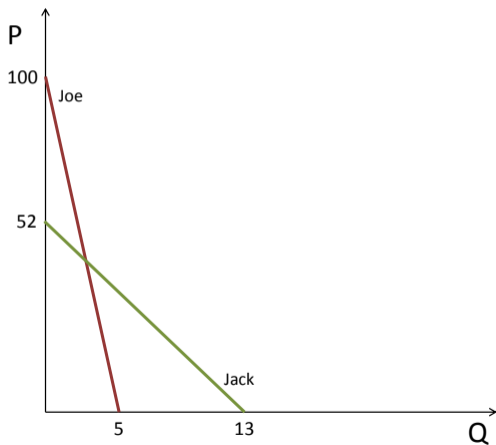
- For which prices is there only one person in the market?

Joe and Jack's Demand In Pictures



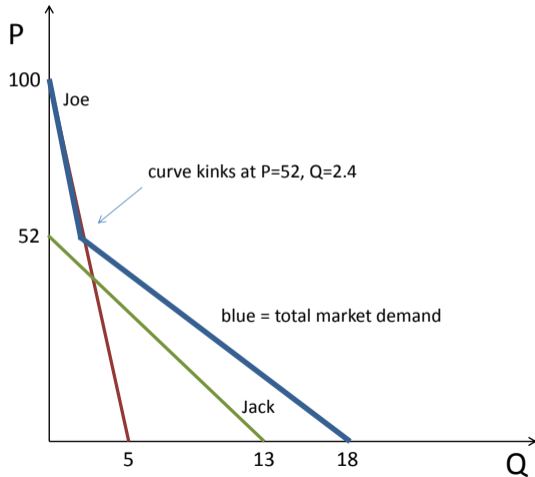
- For which prices is there only one person in the market? Joe, prices 52 to 100
- For which prices are both Joe and Jack in the market?

Joe and Jack's Demand In Pictures



- For which prices is there only one person in the market? Joe, prices 52 to 100
- For which prices are both Joe and Jack in the market? prices 0 to 52

Market Demand in Pictures



- A kinked demand has an economic meaning
- Not everyone is in the market for all prices

The Algebra of Demand Curve Addition

- At $P > \$52$, Jack doesn't want any more
- At $P > \$100$, Joe doesn't want any more
- No one wants to pay more than \$100
- The maximum total quantity demanded is $Q = 18$

The Algebra of Demand Curve Addition

- At $P > \$52$, Jack doesn't want any more
- At $P > \$100$, Joe doesn't want any more
- No one wants to pay more than \$100
- The maximum total quantity demanded is $Q = 18$

We write this as

$$Q_M = \begin{cases} Q_{Joe} + Q_{Jack} = 18 - 0.3P & \text{if } 0 < P \leq 52 \\ Q_{Joe} = 5 - 0.05P & \text{if } 52 < P \leq 100 \end{cases}$$

Adding Demand Curves

In a very small town, only Jim and Alice want gasoline. Jim's demand is $Q_J = 15 - 3P$ and Alice's is $Q_A = 30 - 5P$.

1. Draw individual demand curves
2. Find the equation for the market demand for gas
3. Draw the market demand curve

Answer: Adding Demand Curves

1. Draw demand curves – your job!
2. Equation for market demand
 - Find maximum willingness to pay, or price at $Q = 0$
 - For Alice, $0 = 30 - 5P$, or $P = 6$
 - For Jim, $0 = 15 - 3P$, or $P = 5$
 - \rightarrow for prices 0 to 5, add the curves: $Q_M = 15 - 3P + 30 - 5P = 45 - 8P$
 - for prices 5 to 6, only Alice is in the market, and her curve is market demand

$$Q_M = \begin{cases} 45 - 8P & \text{if } 0 < P < 5 \\ 30 - 5P & \text{if } P > 5 \end{cases}$$

3. Market demand curve picture: your job!

Use Numbers 2 of 3 Recap

Discuss with your group

- Q3
 - a. Which station has higher ridership? Give two explanations why.
 - b. Which station has a greater change in ridership after the pandemic. Why?
- Use data to show another dimension of demand.

Recap of Today

- Changes in Income and Utility Maximization
- Changes in Prices and Utility Maximization
- Market Demand

Next Class

- Taxes!
 - Reading packet: Gruber, Chapter 19, selected pages
 - skim GLS 19.4
 - Read introductions of two papers linked on course website