

Economics 102	Name <u>ANNOTATED KEY for</u>
Fall 2015	TA Name _____
October 12, 2015	Discussion Section # _____
First Midterm	Student ID # _____

8:50

EXAM

Version 1

**DO NOT BEGIN WORKING UNTIL THE INSTRUCTOR TELLS YOU TO DO SO  
READ THESE INSTRUCTIONS FIRST.**

You have 50 minutes to complete the exam, **including filling in your scantron**. The exam consists of **10 binary choice questions worth 2 points each** and **19 multiple choice questions worth 4 points each**. Please accurately and completely provide your **name, ID number, discussion section number, version number, and TA name** on the scantron sheet and the exam booklet. Writing all this information correctly is worth **4 points**. Answer all questions on the scantron sheet with a **#2 pencil**. There are **15 printed pages** in this exam, including this cover sheet. **DO NOT PULL THE EXAM APART OR REMOVE THE STAPLE.**

**WARNING: NO COMMUNICATION OR CALCULATING DEVICES, OR FORMULA SHEETS ARE ALLOWED. NO CONSULTATION AND CONVERSATION WITH OTHERS ARE ALLOWED WHILE YOU ARE TAKING THE EXAM OR IN THE EXAM ROOM. ACADEMIC MISCONDUCT IS A SERIOUS OFFENSE AND PUNISHABLE TO THE FULLEST EXTENT. PICK THE BEST ANSWER FOR EACH QUESTION.**

**How to fill in the scantron sheet and other information:**

1. Print your last name, first name, and middle initial in the spaces marked "Last Name," "First Name," and "MI." Fill in the corresponding bubbles below.
  2. Print your student ID number in the space marked "Identification Number." Fill in the bubbles.
  3. Write the number of the discussion section you've been attending under "Special Codes" spaces ABC, and fill in the bubbles. At the bottom of this page you will find the discussion numbers.
  4. Write the version number of your exam booklet under "Special Codes" space D, and fill in the bubble. The version number is at the top of this page.
- If there is an error on the exam or you do not understand something, make a note on your exam booklet and the issue will be addressed **AFTER** the examination is complete. No questions regarding the exam can be addressed while the exam is being administered.
  - When you are finished, please get up quietly and bring your scantron sheet and this exam booklet to the place indicated by the instructors.

Saiah Lee	Omer Baysal	Carlos Yevenes
<u>335</u> Fri 9:55 AM Van Hise 487	<u>337</u> Fri 9:55 AM Van Hise 475	<u>330</u> Thurs 3:30 PM Van Hise 387
<u>340</u> Fri 11:00 PM Van Hise 495	<u>341</u> Fri 12:05 PM Ingraham 223	<u>331</u> Thurs 2:25 PM Ingraham 224
	<u>342</u> Fri 11:00 AM Van Hise 491	<u>332</u> Fri 2:25 PM Van Hise 367
		<u>333</u> Fri 1:20 PM Van Hise 386

I, \_\_\_\_\_, agree to neither give nor receive any help on this exam from others. I understand that the use of a calculator or communication device on this exam is academic misconduct. I also understand that providing answers to questions on this exam to other students is academic misconduct, as is taking or receiving answers to questions on this exam from other students. Thus, I will cover my answers and not expose my answers to other students. It is important to me to be a person of integrity and that means ALL ANSWERS on this exam are my answers. Any violation of these guidelines will result in a penalty of at least receiving a zero on this exam.

Signed \_\_\_\_\_

**Binary Choice (worth 2 points each)**

*Definitional*

1) Which of the following statements is a normative statement?

*→ subjective, value-oriented, what should be, what ought to be*

- a. Government-provided healthcare increases public expenditures. *X This is testable*  
b. Government should provide basic healthcare to all citizens. *An opinion, a value*

*Definitional*

2) What do we call data on the 2015 income of 100 million households?

*Data collected at one pt. in time*

- a. Cross-sectional data  
b. Time-series data

*Data Review*

3) You are the fourth tallest person in a group of 20 students. That means you are at the:

- a. 20<sup>th</sup> percentile  
b. 80<sup>th</sup> percentile

*Tallest person is at 100% of the group*

*Definitional*

4) The determining factors behind the central bank's interest rate policy is investigated primarily in:

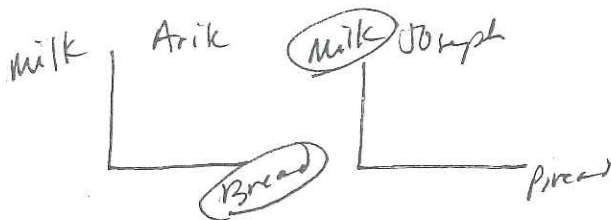
- a. Microeconomics  
b. Macroeconomics

*Definitional*

5) In the circular flow diagram, factors of production include:

- a. Land, Labor and Capital  
b. Goods and Services





Application

- 6) Arik and Joseph produce only bread and milk. Arik has the comparative advantage over Joseph in the production of bread while Joseph has the comparative advantage over Arik in the production of milk. Given that there is NO trade between these two individuals, and that Arik and Joseph currently produce both of these two goods, we can conclude that their joint production is:

- a. efficient.  
 b. not efficient.

They could expand their total production by specializing according to comp adv of then trading w/ one another

Harder: some analysis required

- 7) Consider a market with 4 consumers. The demand curve for each of these consumers is given by the following equations where P is the price per unit in dollars and Q is the quantity of the good:

- Consumer 1:  $P = 10 - Q_1$   
 Consumer 2:  $P = 15 - Q_2$   
 Consumer 3:  $P = 5 - Q_3$   
 Consumer 4:  $P = 20 - Q_4$

→ see next page

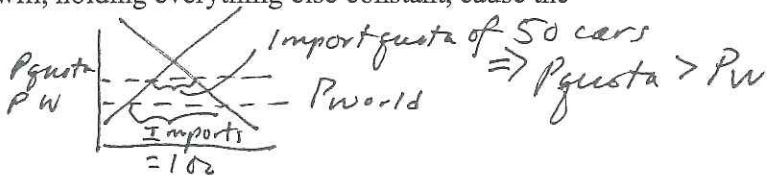
- Given the above information and holding everything else constant, the slope of the aggregate demand curve when the price is between \$5 and \$10 is:

- a.  $-1/2$   
 b.  $-1/3$

Conceptual understanding

- 8) Suppose that a country currently imports 100 cars per month. The imposition of an import quota of 50 cars per month will, holding everything else constant, cause the country's price for a car to be:

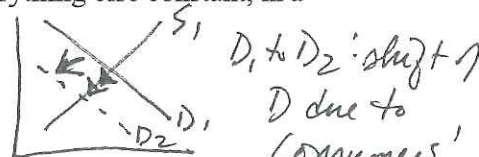
- a. above the world price.  
 b. below the world price.



Basic Supply and Demand

- 9) Consider the United States market for oil that is initially in equilibrium. Suppose people in the United States expect their future incomes to decrease and that oil is a normal good. Then, given this information and holding everything else constant, in a graph of demand and supply we should see:

- a. A movement along the supply curve.  
 b. A shift of the supply curve.



$D_1$  to  $D_2$ : shift -  
 D due to consumers' price expectations:  
 causes a movement along supply curve

GDP method 2 conceptual understanding

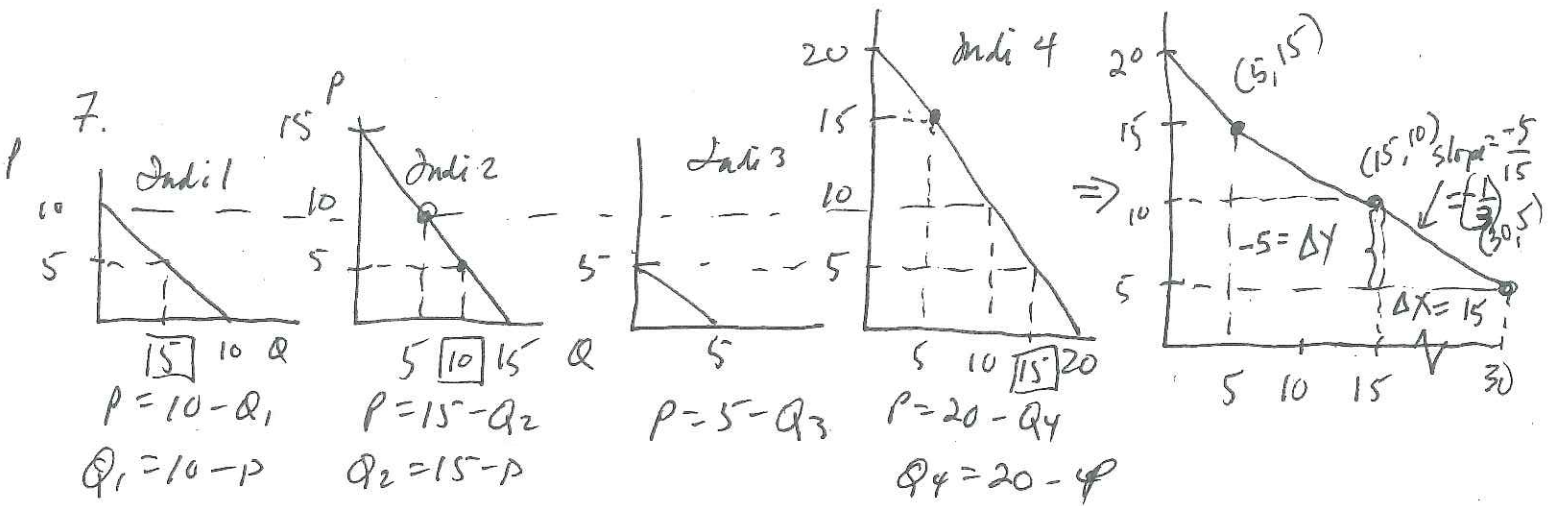
- 10) Suppose that in an economy there is an increase in the consumption of imported goods. Given this information and holding everything else constant, then in this economy:

- a. GDP will decrease.  
 b. This change will have no effect on GDP.

$$GDP = C + I + G + (X - IM)$$

if  $IM \uparrow$  by \$10, so does  $C \Rightarrow$  net effect on GDP is zero!

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or  $Q_T$  for  $P$  between 5 & 10:

$$Q_1 + Q_2 + Q_4 = [10 - P] + [15 - P] + [20 - P]$$

$$Q_T = 45 - 3P$$

$$3P = 45 - Q$$

$$P = 15 - \frac{1}{3}Q \Rightarrow \boxed{m = -\frac{1}{3}} !$$

**Multiple Choice (worth 4 points each)**

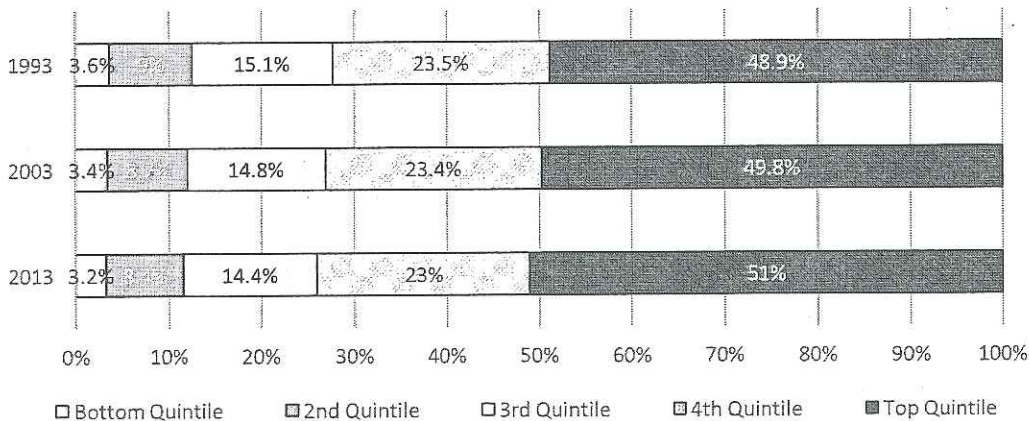
11) Which of the following statements might be scientifically tested using time series data?

- I. Output and unemployment tend to move together. *Yes*
- II. Higher income allows people to satisfy their needs better and one would expect that consumption levels of goods and services would be higher in richer countries at a given point in time. *No: not looking at data over time*
- III. Free lunches improve individual student performance. *Yes*
- IV. Average economic growth rates of US declined over time compare to other OECD countries. *Yes*

- a. I only
- b. I and III
- c. I, III, and IV
- d. I, II, III, and IV

12) The figure below is the Quintile Shares of Total Income 1993-2013 that is created based on data from the U.S. Census Bureau. According to this figure, which of the following statements is NOT true?

Share of Total Household Income (%)



- a. The graph compares quintile income shares across 1993, 2003 and 2013. *True*
- b. It reveals growing concentration of U.S. household income at the top of the distribution. *True 48.9 to 49.8 to 51*
- c. The shares of total income held by the four lowest quintiles fell between 1993 and 2003. *True*
- d. The shares of total income held by the four highest quintiles fell between 2003 and 2013. *FALSE*

*Handwritten calculations and notes:*

*1993 =>*

3.6
9
15.1
23.5
<u>51.2%</u>

*2003 =>*

3.4
8.7
14.8
23.4
<u>50.3%</u>

*2013 =>*

3.2
8.4
14.8
23.4
<u>50.8%</u>

*2003 =>*

49.8
23.4
14.8
8.7
<u>96.7</u>

*or from graph bottom 96.7*

*96.8*

*3.2% 2013 vs 3.4% 2003*

*Reading comp - 11) Which of the following statements might be scientifically tested using time series data?*

*Looking for the FALSE statement; reading graph*



PPF analysis: need to be careful, but this is not hard

13) Eric needs to solve the 462 problems in the Econ 102 textbook. Suppose the relationship for Eric between hours spent solving questions and the number of questions solved is linear. You also know the following information: yesterday, Eric spent 2 hours solving 44 problems and today, he solved 176 problems in 8 hours. If he continues to solve the problems at the same rate, how many additional hours will it take for Eric to solve all the questions in the textbook?

- a. 11 hours
- b. 15 hours
- c. 19 hours
- d. 21 hours

2 hours to solve 44 problems  $\Rightarrow$  1 hour for 22 problems  
 8 hours to solve 176 problems  
 220 problems solved  
 $462 - 220 = 242$  problems left to solve  
 $242 / 22 = \#$  of hours he needs = 11 hours

%  $\Delta$  formula: did you apply it correctly? Not hard.

14) In a recent article in The Economist it was noted that "passenger cars made by Ford and G.M. averaged 40 miles per gallon, according to federal rankings, compared with 36 m.p.g. [miles per gallon] a decade ago." The percentage change in gas mileage for these cars over this decade is approximately equal to:

- a. 9%
- b. 10%
- c. 11%
- d. 12%

36 = initial value  
 40 = new value  
 $\% \Delta$  in gas mileage =  $\left[ \frac{40 - 36}{36} \right] (100\%)$   
 $= \left( \frac{1}{9} \right) 100\% = \frac{100}{9}\%$

11.11%  
 $9 \overline{) 100}$   
 $\underline{9}$   
 $10$   
 $\underline{9}$   
 $1$

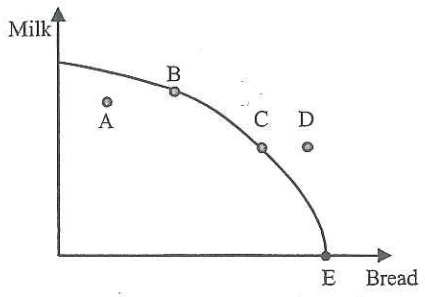
Definitional: Reminders about existence of market failure

15) If a market generates a side effect or externality, then free market solutions in this market:

- a. maximize producer surplus.
- b. are efficient.
- c. are inefficient.
- d. are equitable.

Reading graph & applying PPF basic concepts

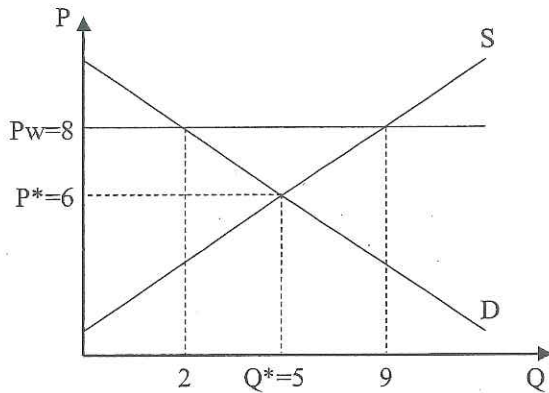
16) Given the PPF in the figure below, which of the following statements is true?



- a. A, is not feasible, but it is an efficient production point. ~~X~~ A is feasible, but inefficient
- b. B is a more efficient production point than C. ~~X~~ All points on PPF are efficient
- c. Both C and D are feasible production points. ~~X~~ D is not feasible
- d. E is a feasible and efficient production point.  $\checkmark$

- 17) The linear domestic supply and domestic demand curves are given as drawn in the figure below. The equilibrium price,  $P^*$ , is \$6 and the equilibrium quantity,  $Q^*$ , is 5. Under free trade the world price,  $P_w$ , is \$8. Given this information and holding everything else constant, which of the following statements is true?

Just reading  
the graph  
& understanding  
the concepts  
Easy question



- a. If this economy opens to trade, this economy will export 7 units of the good. ✓  
 b. If this economy opens to trade, this economy will import 4 units of the good. X  
 c. If this market opens to trade, domestic consumers will pay \$6 when they buy one unit of the good. X *If open to trade, price will be  $P_w = 8$  or more*  
 d. If this market opens to trade, domestic producers will receive \$2 less per unit than they would if this market was a closed market. X

a) At  $P_w$  :  $Q_{Dom}^D = 9$   
 $Q_{Dom}^S = 2$  } exports = 7

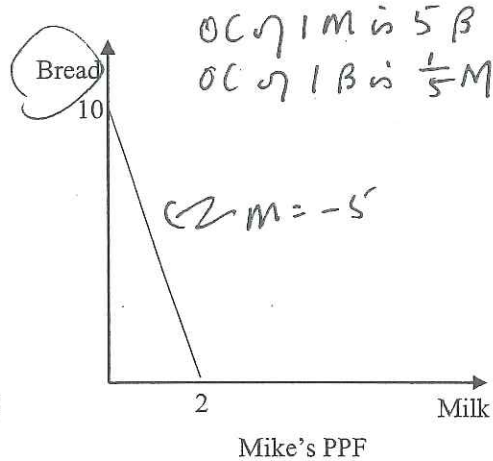
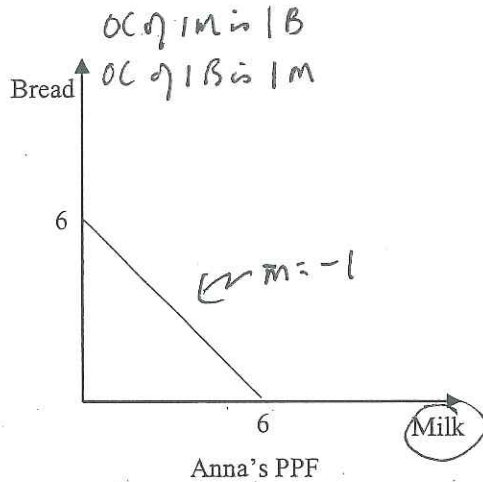
b) Since  $P_w > P_{e \text{ closed economy}}$

we know that if this economy open to trade it will export the good

c) If economy opens to trade domestic producers will sell the good at the world price which is \$2 more per unit than closed economy price of \$6/unit

Use the following information to answer the next two (2) questions.

Anna and Mike produce milk and bread. Their production possibility frontiers are shown in the graphs below.

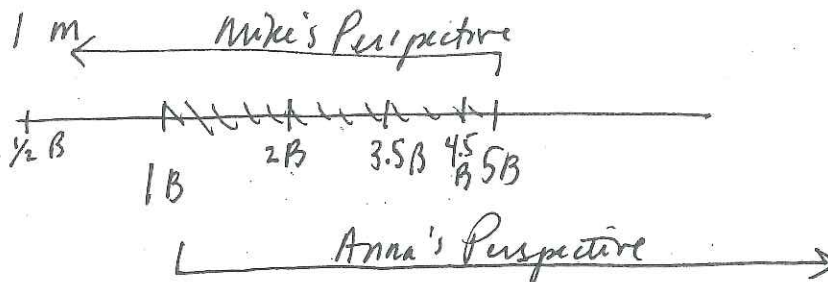


- 18) Anna's opportunity cost for producing an additional unit of bread or an additional unit of milk are 1M and 1B respectively, while Mike's opportunity cost for producing an additional unit of bread or an additional unit of milk are 1/5M and 5B respectively. Given these PPFs, Anna should specialize in producing milk while Mike should specialize in producing bread.

- Easy follows classroom example => you should be able to quickly eliminate answers (c) and (d)*
- a. 1 unit of milk; 1 unit of bread; 1/5 unit of milk; 5 units of bread; milk; bread
  - b. 1 unit of milk; 1 unit of bread; 1/5 unit of milk; 5 units of bread; bread; milk
  - c. 6 units of milk; 6 units of bread; 2 unit of milk; 10 units of bread; milk; bread
  - d. 6 units of milk; 6 units of bread; 2 unit of milk; 10 units of bread; bread; milk

- 19) Which of the following prices does NOT fall within the acceptable range of trading prices for Anna and Mike for one unit of milk?

- Easy if you can construct the acceptable range of trading prices*
- a. Half a loaf of bread
  - b. 2 loaves of bread
  - c. 3.5 loaves of bread
  - d. 4.5 loaves of bread





Use the following information to answer the next two (2) questions.

Consider the small, closed economy. In the market for cheese in this country you know the following where  $P$  is the price in dollars per unit of cheese and  $Q$  is the number of units of cheese:

Domestic Demand for cheese:  $Q = 55 - \frac{1}{2}P \Rightarrow P = 110 - 2Q$

Domestic Supply of cheese:  $Q = P - 20 \Rightarrow P = Q + 20$

Furthermore, you know that the world price per unit of cheese is \$30.  $P_w = 30$

20) The government of this country decides to open the cheese market to trade. Given this information and holding everything else constant, which of the following statements is true?

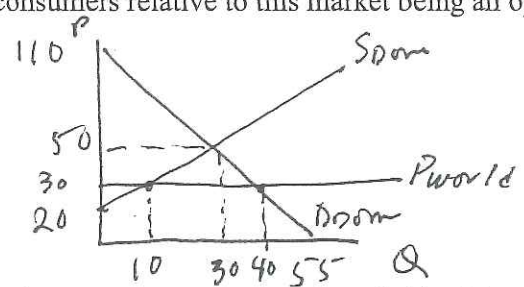
- a. The quantity of cheese supplied by domestic producers increases when this market is opened to trade. *X supply ↓ from 30 to 10 units*
- b. Cheese consumption in this economy increases when this market is opened to trade. *✓ demand & consumption ↑ from 30 to 40 units*
- c. The quantity of cheese supplied by domestic producers is greater than the quantity of cheese supplied by foreign producers when this market is opened to trade. *X Dom. producers supply 10 units, imports = 30 units*
- d. Domestic producers take most of the gains from trade when this market is opened to trade. *X Dom consumers gain from opening this mkt to trade*

21) Suppose that the market for cheese is opened in this economy, but the government also decides to impose an import quota of 15 units of cheese. Given this information and holding everything else constant, which of the following statements is true?

- a. Because of the import quota, the domestic price of cheese is now lower *X higher* than the world price of cheese. *X*
- b. With the imposition of this import quota, cheese consumption in this economy increases relative to the level of cheese consumption in this economy when it is an open economy. *X Since P ↑ w/ import quota, Q ↓*
- c. With the imposition of this import quota, the quantity of cheese supplied by domestic producers is greater than the quantity of cheese supplied by foreign producers.
- d. This import quota imposed by the government is a favorable policy for domestic consumers relative to this market being an open market. *X Import quota is favorable policy for domestic producers*

20)  
 $55 - \frac{1}{2}P = P - 20$   
 $75 = \frac{3}{2}P$   
 $P = 75(\frac{2}{3}) = 50$   
 $Q = 30$

Closed economy



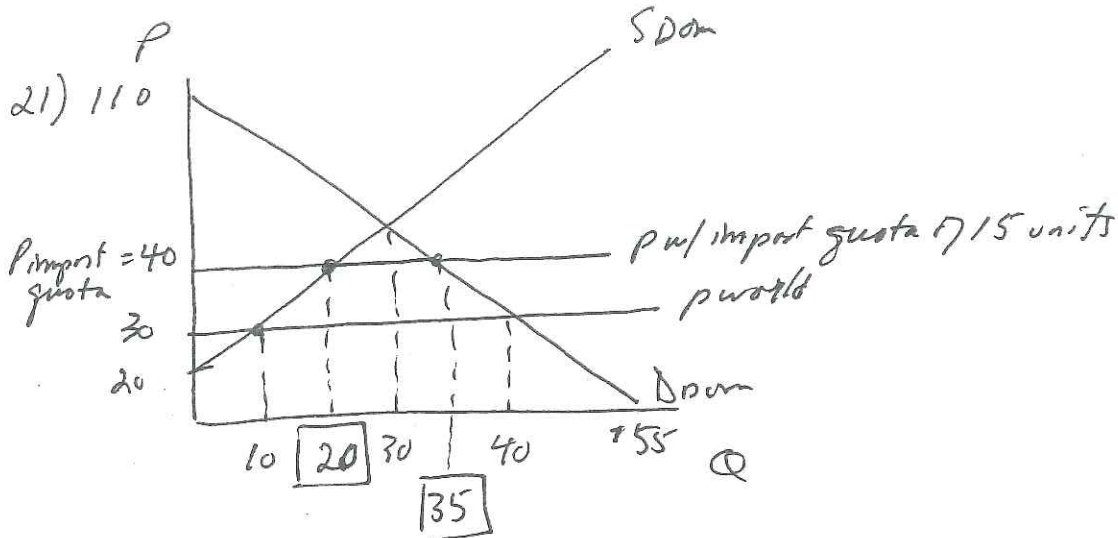
If mkt opens,  $P_w < P_{closed} \Rightarrow$  economy will import the good

If mkt opens,  $CS_{trade} \uparrow$  relative to  $CS_{closed}$   
 $PS_{trade} \downarrow$  relative to  $PS_{closed}$  } Dom. consumers gain from trade

Requires some analysis

A bit of thinking required here - but if you understand this topic, this is an easy question (see note next page)

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To answer (c) requires some work: I can easily eliminate answers (a), (b) and (d) — so if I am confident I can just assume that (c) is the correct answer! But, let's do the work!

With the import quota:

$$Q_{Dom}^{S\ w/\ quota} + \text{Import Quota} = Q_{Dom}^{D\ w/\ quota}$$

$$[P - 20] + 15 = 55 - \left(\frac{1}{2}\right)P$$

$$P - 5 = 55 - \left(\frac{1}{2}\right)P$$

$$\left(\frac{3}{2}\right)P = 60$$

$$P = 60 \left(\frac{2}{3}\right) = 40$$

$$Q_{Dom}^{S\ w/\ quota} = P - 20$$

$Q_{Dom}^{S\ w/\ quota} = 40 - 20 = 20 \Rightarrow$  so quantity of cheese supplied by domestic producers in this example when there is an import quota is 20 units and 20 units is  $>$  15 units of the import quota

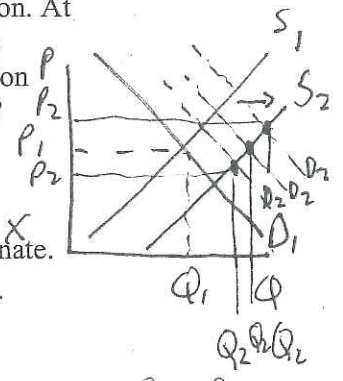


Basic supply & demand analysis

- 22) Suppose the equilibrium price of an inferior good decreases and the equilibrium quantity of that same good also decreases. A possible explanation for this outcome is:
- Income decreased.
  - The price of an important input used in the production of the good decreased.
  - The price of a complement good in consumption increased.
  - The price of a substitute good in consumption increased.

Basic indeterminacy analysis

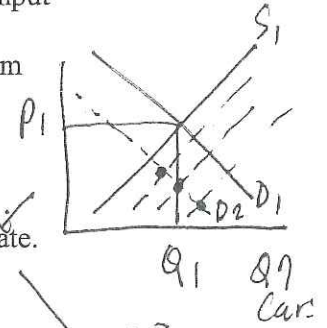
- 23) Consider the market for personal computers that is initially in equilibrium. Assume that a new technology is discovered which lowers the marginal cost of production. At the same time, users of these personal computers find that they want the newest model because of its ability to allow the user to multi-task. Given this information and holding everything else constant, which of the following statements is true? Relative to the initial equilibrium price and equilibrium quantity, the new equilibrium:



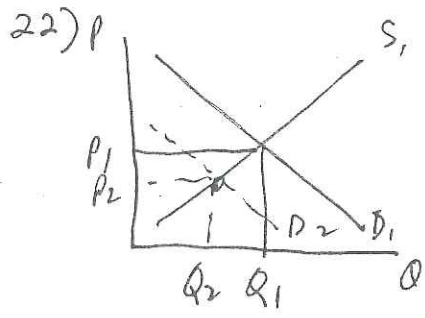
- Price is indeterminate and the new equilibrium quantity is indeterminate.
- Price increases and the new equilibrium quantity increases.
- Price is indeterminate and the new equilibrium quantity increases.
- Price decreases and the new equilibrium quantity is indeterminate.

More indeterminacy

- 24) Consider the market for automobiles that is initially in equilibrium. People suddenly start using more public transportation in order to reduce the amount of pollution produced by driving cars. At the same time, automobile producers substitute an input of production that is cheaper than the input they have been using. Given this information and holding everything else constant, relative to the initial equilibrium price and quantity, the new equilibrium:



- Price increases but the new equilibrium quantity is indeterminate.
- Price increases and the new equilibrium quantity increases.
- Price is indeterminate and the new equilibrium quantity is indeterminate.
- Price decreases and the new equilibrium quantity is indeterminate.



- If income ↓, then  $D_2$  shifts to the right of  $D_1$  X
- This causes  $S_1$  to shift to the left ⇒ will not give us the result we have ⇒  $P \uparrow$  while  $Q \downarrow$  X
- If price of complement good in consumption ↑, then buy less of this good ⇒ will demand less of its complement ⇒  $D_1$  shifts left to  $D_2$  ✓
- If price of sub-good in consumption ↑, then demand for other good will shift right ⇒  $P \uparrow, Q \uparrow$  X



Need to know formulas & then do the work (see below)

25) In the following economy two goods are produced: Apples and Bananas. Suppose 2014 is the base year for purposes of calculating real GDP. *BY = 2014*

	Quantities		Prices	
	Apples	Bananas	Price per Apple	Price per Banana
2013	10	5	\$2	\$10
2014	12	7	\$3	\$12

← prices use!

According to the data above, the approximate change in real GDP in percentage terms between 2013 and 2014 is:

- a. 33%
- b. 25%
- c. 30%
- d. 50%

Application of GDP definition

26) Suppose that John gets a loan of 100 dollars for the year. The bank doesn't charge any interest on the loan but it does charge John a fee of \$1 for the financial service it has provided to him. Given this information, what is the contribution of this transaction to this year's GDP?

- a. \$100
- b. \$1
- c. \$101
- d. \$99

$$25) \text{ real GDP} = \sum_{i=1}^n P_i^{BY} Q_i^{CY}$$

$$\text{real GDP}_{2013} = (10 \text{ apples})(\$3/\text{apple}) + (5 \text{ Bananas})(\$12/\text{banana})$$

$$= \$30 + \$60 = \$90$$

$$\text{real GDP}_{2014} = (12 \text{ apples})(\$3/\text{apple}) + (7 \text{ bananas})(\$12/\text{bananas})$$

$$= \$36 + \$84 = \$120$$

$$\% \Delta \text{ in real GDP} = \left[ \frac{120 - 90}{90} \right] (100\%)$$

$$= \left( \frac{30}{90} \right) (100\%) = 33\%$$

Use the following information to answer the next three (3) questions.

Consider a market that has a market demand equation where  $P$  is the price per unit and  $Q$  is the quantity of units of the good:

Market Demand:  $P = 10 - Q$

Furthermore, in this market there are only two firms whose individual firm supply curves are given as:

Supply Curve for Firm A:  $P = 2Q_A$

Supply Curve for Firm B:  $P = 2Q_B + 4$

where  $Q_A$  is the quantity supplied by Firm A and  $Q_B$  is the quantity supplied by Firm B.

27) Given the above information, what is the equation for the market supply curve?

- a.  $P = 2Q$  when  $Q$  is between 0 and 2 and  $P = 2 + Q$  when  $Q$  is higher than 2.
- b.  $P = 2Q$  when  $Q$  is between 0 and 2 and  $P = 1 + 2Q$  when  $Q$  is higher than 2.
- c.  $P = 1Q$  when  $Q$  is between 0 and 2 and  $P = 3 + Q$  when  $Q$  is higher than 2.
- d.  $P = 1Q$  when  $Q$  is between 0 and 2 and  $P = 1 + Q$  when  $Q$  is higher than 2.

28) What is the value of producer surplus when this market is in equilibrium? *See work next page*

- a. \$12
- b. \$10
- c. \$11
- d. \$9

29) Now, assume that a third firm enters the market and its owner announces "I will supply 1 unit of the good no matter the price". Find the coordinates,  $(Q, P)$  of the "kink point" of the new market supply curve given this information.

- a.  $(Q, P) = (2, \$4)$
- b.  $(Q, P) = (2, \$5)$
- c.  $(Q, P) = (3, \$5)$
- d.  $(Q, P) = (3, \$4)$

*Alternatively, writing equation for this segment of mkt S:*

$$m = \frac{\Delta y}{\Delta x} = \frac{4}{4} = 1$$

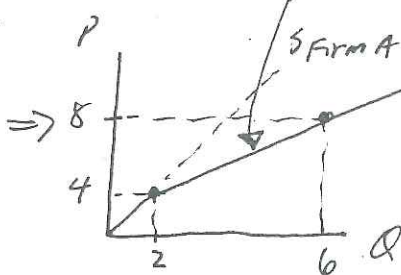
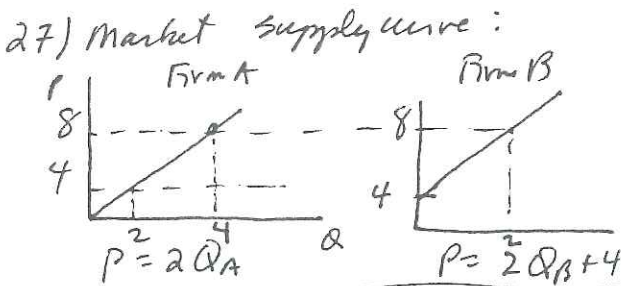
$$P = 7Q + b$$

$$8 = 6 + b$$

$$b = 2$$

$P = Q + 2 \text{ for } Q \geq 2$

*See work next page*



Mkt supply curve: For  $Q \leq 2 \Rightarrow P = 2Q$   
 For  $Q \geq 2 \Rightarrow P = Q + 2$

**X ANSWER w/ 2 methods provided**

$\frac{1}{2}P = Q_A$   
 $P - 4 = 2Q_B$   
 $Q_B = \frac{1}{2}P - 2$

*Use these to get equation for mkt supply when  $Q \geq 2$*

$$Q_A + Q_B = \left(\frac{1}{2}\right)P + \left(\frac{1}{2}\right)P - 2$$

$$Q_{TOTAL} = P - 2 \text{ or } P = Q + 2 \text{ when } Q \geq 2$$

END OF EXAM

(This page is intentionally left blank as an extra work sheet.)  
DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!

28) Find mkt eq.  
 $P = 10 - Q$

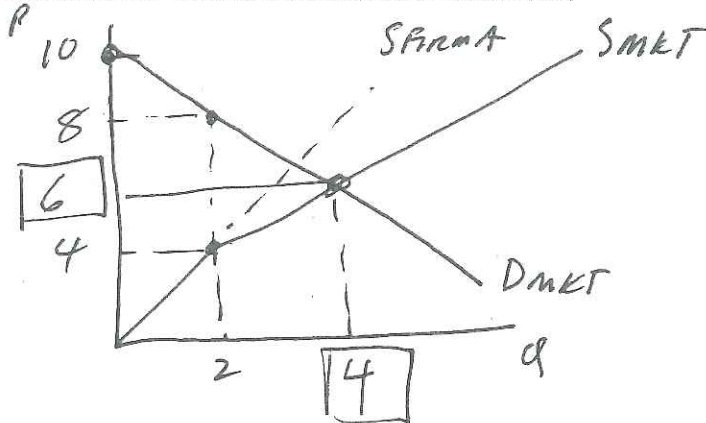
First identify the mkt  
Supply equation you need  $\Rightarrow$   
if  $Q = 2 \Rightarrow$  then  $P$  from  
demand equation is  $8 \Rightarrow$  we  
need  $P = Q + 2$  as the mkt  
supply equation

D:  $P = 10 - Q$   
S:  $P = Q + 2$

$$\left. \begin{array}{l} 10 - Q = Q + 2 \\ 8 = 2Q \\ 4 = Q \end{array} \right\}$$

if  $Q = 4$ , then  $P = 10 - Q$   
 $P = 10 - 4 = 6$

$\& \quad P = Q + 2$   
 $P = 4 + 2 = 6 \checkmark$



PS = a funny shaped object!

PS = + +

$PS = (\frac{1}{2})(4-0)(2) + (6-4)(2-0) + (\frac{1}{2})(6-4)(4-2)$

$PS = 4 + 4 + 2 = \$10$

29)

