Economics 101	Name *ANNOTATED KEY*
Fall 2016	TA Name _____
November 22, 2016	Discussion Section #_____
Second Midterm	Student ID # _____

Version 1

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

You have 75 minutes to complete the exam, **including filling in your scantron.** The exam consists of **9 binary choice questions worth 2 points each** and **20 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 2 points.** Answer all questions on the scantron sheet with a #2 pencil. There are 14 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. The discussion numbers can be found at the bottom of this page.
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.**

Iuliia (Yulia) Dudareva	Taehoon Kim	Xiaoye (Phoebe) Tian	Wenqi Wu
301 Thurs 3:30 PM Ingraham 116	**302** Fri 2:25 PM Ingraham 225	**303** Fri 1:20 PM Van Vleck B219	**308** Fri 8:50 AM Sterling 1407
304 Fri 12:05 PM Van Hise 386	**305** Fri 12:05 PM Van Hise 207	**307** Fri 11:00 AM Van Hise 391	**310** Fri 11:00 AM Sterling 2403
312 Fri 9:55 AM Van Hise 219	**306** Thurs 4:35 PM Social Sciences 6322	**311** Fri 9:55 AM Van Hise 240	
314 Fri 1:20 PM Van Hise 209	**309** Fri 11:00 AM Sterling 2319	**313** Fri 8:50 AM Van Hise 123	

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 <u>at least</u> receiving a zero on this exam.

Signed _____
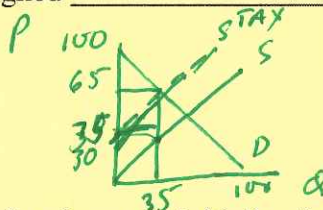
Binary Choice (worth 2 points each)

SOME WORK & THOUGHT REQUIRED HERE

1. Suppose that the supply and demand for cigars are initially given by the following equations:
   Demand: $P = 100 - Q$
   Supply: $P = Q$

Suppose that an excise tax of $30 per cigar is implemented in this market. The government then realizes that it is not maximizing its revenue from taxing cigars. Should the government increase or decrease the amount of the excise tax to maximize revenues?

   (a.) The government should increase the amount of the excise tax per unit.
   b. The government should decrease the amount of the excise tax per unit.

Handwritten work:
P 100, 65, 35, 30, STAX, S, D, Q, 35, 100
$100 - Q = Q + 30$
$70 = 2Q$
$35 = Q$
TAX REV initially $= 30(35) = \$1050$

if $T \uparrow t.40 \Rightarrow$ $100 - Q = Q + 40$, $60 = 2Q$, $30 = Q_T'$, TAX REV = $(40)(30) = 1200$

if $T \downarrow$ to 20 $\Rightarrow 100 - Q = Q + 20$, $80 = 2Q$, $Q = 40$, Tax Rev" $= (40)(20) = 800$

JUST APPLYING THE FORMULA

2. Suppose that the CPI, measured in 1990 dollars, increased from 80 to 120 between the year 1985 and the year 1995. Based on this information and holding everything else constant, what do we know about the nominal price and real price of a certain good in 1985?

   a. The nominal price is higher than the real price.
   (b.) The nominal price is lower than the real price.

Handwritten work:

Year	CPI BY 1990	nom	real
1985	80	100*	125
1995	120		

real $= \frac{nom}{CPI}$ (scale)
real $= \frac{100}{80}(100) = \frac{25}{2}(10) = 125$

* made up #

EASY: DEFINITIONAL

3. Suppose that Donald buys 5 oranges and 5 pumpkins under the current market prices. If the price of oranges increases by 10%, then he buys no oranges and 10 pumpkins. Based on this information, for Donald oranges and pumpkins are _____.

   (a.) substitutes.
   b. complements.
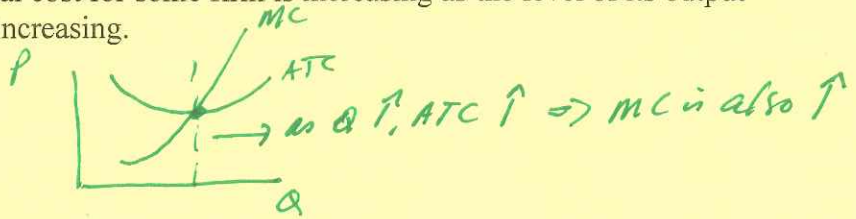
Handwritten work:
P oranges $\uparrow$
Q^D oranges $\downarrow$
Q^D pumpkins $\uparrow$

A price of good X $\uparrow$, the Q^D of good Y $\uparrow$ $\Rightarrow$ X & Y must be substitutes

4. **True or False:** If the average total cost for some firm is increasing as the level of its output increases, then its marginal cost is increasing.

MC

P | *ATC*

→ as $Q \uparrow$, $ATC \uparrow$ ⇒ MC is also $\uparrow$

a. True.
b. False.

Q

EASY!
DEFINITIONAL

5. In a perfectly competitive market

a. The demand curve that any individual firm faces is perfectly elastic ✓ and the market demand is also perfectly elastic. ✗

b. Each firm makes zero economic profit in the long run.

EITHER
EASY
OR
QUITE
HARD

6. The following equation describes the demand for Cranberries, where P is the price per pound for cranberries, I is the average income and Q is the quantity in pounds:
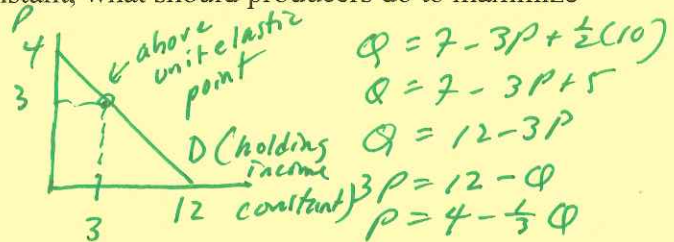
$$Q = 7 - 3P + 0.5I$$

⇒ $Q = 7 - 3(3) + \frac{1}{2}(10)$
$Q = 7 - 9 + 5 = 3$

You are told that average income is $10 and that the price of a pound of cranberries is $3. Given this information and holding everything else constant, what should producers do to maximize their total revenue?
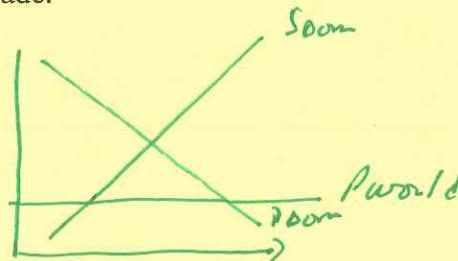
P

4
3 — above unit elastic point

a. Producers should increase price.
b. Producers should decrease price.

3   12

D (holding income constant)

$Q = 7 - 3P + \frac{1}{2}(10)$
$Q = 7 - 3P + 5$
$Q = 12 - 3P$
$3P = 12 - Q$
$P = 4 - \frac{1}{3}Q$

VERY
EASY

7. **True or False:** If the world price of a certain good is lower than the domestic equilibrium price, then the domestic consumer surplus under free international trade must be larger than the domestic consumer surplus without international trade.

Sdom

a. True.
b. False.

Ddom   Pworld

8. Based on the following graph, which of the statements is **TRUE**?

Crime in America
Rate per 100,000 people

Violent crime | Murder | Property crime, '000

(handwritten annotations on graph: 600, 375, 5.75, 3.6, 2.5)

Source: FBI

Economist.com

    a. The percentage change in the rate of property crimes between 2000 and 2015 is the greatest, while the percentage change in the rate of murders between 2000 and 2015 is the smallest.

    b. The rate of the total number of crimes per 100,000 declines more than 60% between 1980 and 2015.

(handwritten): Consider answer (b) first ⇒ less to analyze

$$\% \text{ in violent crime} = \left[\frac{375-600}{600}\right](100\%) = \left(\frac{225}{600}\right)(100\%) = \frac{22.5}{6} = 37.5\% < 60\%$$

(b) is false ⇒ can stop here & conclude (a) is correct answer

9. The following table shows Portugal's trade with Sweden in the late 1700s. All the numbers are measured in millions of *Real* (the Portuguese currency at the time).

(handwritten left margin): Exports − (Imports)

(handwritten left margin, vertical): all negative #'s

	Imports (1)	Exports (2)
1776	155	28
1777	183	55
1783	456	98
1787	270	30
1789	382	16
1796	673	165
1797	634	159
1798	302	205
1799	1,496	237
1800	1,164	148

(handwritten): But consider (a)

$$\left(100\%\right)\left(\frac{-.75}{5.75}\right) = \left(\frac{5-5.75}{5.75}\right)100\% \quad \uparrow \text{smaller} \quad \% \Delta \text{ in property crime}$$

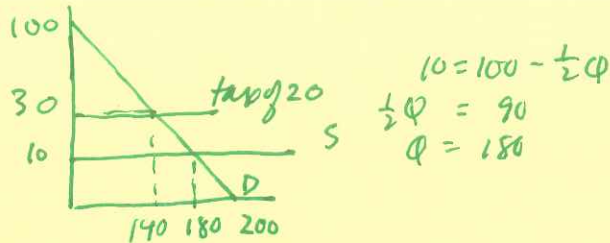$$100\%\left(\frac{-1.1}{3.6}\right) = \frac{2.5-3.6}{3.6}(100\%) \quad \uparrow \text{larger} \quad \% \Delta \text{ in murder}$$

Which of the following is true in this period?

    a. Portugal's net imports per year were always growing over the years given in the table. *(handwritten X)*

    b. Portugal's annual trade surplus (the difference between exports and imports) for the years provided was negative. ✓

(handwritten graph, top right)

100

30

10 ...... $tax \ 20$ ...... S

D

$140 \ 180 \ 200$

$10 = 100 - \frac{1}{2}Q$
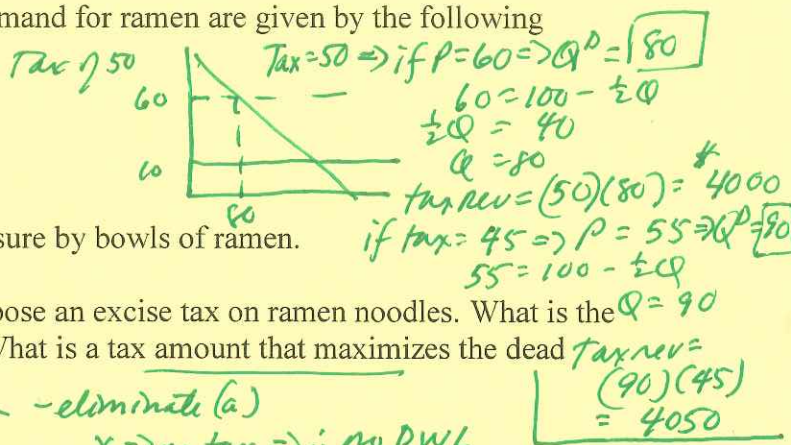$\frac{1}{2}Q = 90$
$Q = 180$

Multiple Choice (worth 4 points each)

Use the following information to answer the next <u>two (2)</u> questions:

In the ninja village of Konoha, the supply and demand for ramen are given by the following equations:

Supply: P = 10
Demand: P = 100 − 0.5Q

P is measured by Japanese yen (¥), and Q is measure by bowls of ramen.

(handwritten, right)
$Tax \ 50$
60
60

$Tax = 50 \Rightarrow if \ P = 60 \Rightarrow Q^D = \boxed{80}$
$60 = 100 - \frac{1}{2}Q$
$\frac{1}{2}Q = 40$
$Q = 80$
$tax \ Rev = (50)(80) = 4000$
$if \ tax = 45 \Rightarrow P = 55 \Rightarrow Q^D = \boxed{90}$
$55 = 100 - \frac{1}{2}Q$
$Q = 90$
$Tax \ rev = (90)(45) = 4050$

*(handwritten left margin)* SOME WORK HERE

10. Hokage , the ruler of Konoha, decides to impose an excise tax on ramen noodles. What is the tax amount that maximizes Hokage's revenue? What is a tax amount that maximizes the dead weight loss (DWL)? *(handwritten: → start w/ this question – eliminate (a))*

(handwritten left: 45 / 90 / 40 50)

a. ¥50 per bowl of ramen; ¥0 per bowl of ramen. *(X ⇒ no tax ⇒ ∴ no DWL)*
b. ¥45 per bowl of ramen; ¥100 per bowl of ramen. *(⇒ tax of ¥100 ⇒ DWL = CS without tax)*
c. ¥50 per bowl of ramen; ¥100 per bowl of ramen. *(⇒ tax of ¥100 ⇒ DWL = CS without tax)*
d. ¥45 per bowl of ramen; ¥45 per bowl of ramen. *(X ⇒ DWL w/ tax of ¥45 < DWL w/ tax of ¥100)*

(answer b circled)

11. Suppose that Hokage decides on a tax amount of ¥20 per bowl of ramen. What is the tax's economic incidence on consumers, and what is the tax's economic incidence on producers, respectively?

(handwritten left margin) EASY IF YOU UNDER-STAND CONCEPT & CAN READ THE GRAPH

(handwritten right)
$tax \ of \ 20 \Rightarrow P = 30 \Rightarrow Q^D = \boxed{140}$
$30 = 100 - \frac{1}{2}Q$
$\frac{1}{2}Q = 70$
$Q = 140$
$CTI = all \ the \ tax \ rev$
$CTI = (20)(140) = 2800$
$PTI = \$0$

a. ¥0 on consumers, ¥2800 on producers. *(X)*
b. ¥4900 on consumers, ¥1400 on producers. *(X)*
c. ¥1400 on consumers, ¥1400 on producers. *(X)*
d. ¥2800 on consumers, ¥0 on producers. ✓ *(circled)*
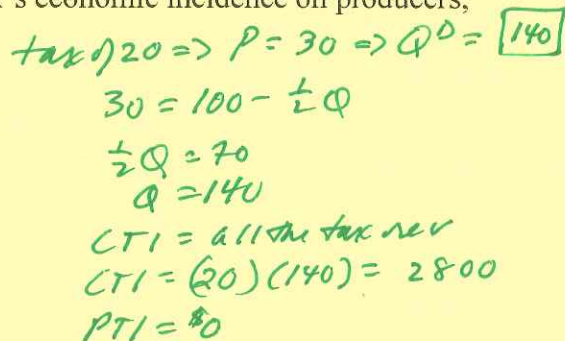
12. The initial price for hot chocolate was \$2 and Sarah bought 4 cups of hot chocolate per week. Later the price increased by 50%. The arc elasticity of Sarah's demand for hot chocolate between these two prices is 5/3. Given this information and holding everything else constant, how many cups of hot chocolate does Sarah buy after the price change?

(handwritten left margin) MORE CHALLENGING

(handwritten)
$(Q_1, P_1) = (4, 2)$
$P \uparrow by \ 50\% \Rightarrow P_2 = 3$
$(Q_2, P_2) = (Q_2, 3)$

$E_D = \frac{5}{3} = \left| \frac{\frac{Q_2 - Q_1}{Q_2 + Q_1}}{\frac{P_2 - P_1}{P_2 + P_1}} \right|$

$\frac{5}{3} = \left| \frac{\frac{Q_2 - 4}{Q_2 + 4}}{\frac{3-2}{5}} \right| = \left| \frac{\frac{Q_2 - 4}{Q_2 + 4}}{\frac{1}{5}} \right|$

a. 6 cups *(X)*
b. 5 cups *(X)*
c. 2 cups *(circled)*
d. 1 cup *(X)*

(handwritten bottom)
$\frac{5}{3} = \ldots \ P \uparrow so \ Q^D \downarrow \Rightarrow eliminates \ (a) \& (b)$
only (c) & (d) ⇒

(c) $\frac{5}{3} = \left| \frac{\frac{2-4}{2+4}}{\frac{1}{5}} \right| = \left| \frac{\frac{-2}{6}}{\frac{1}{5}} \right| = \frac{\frac{1}{3}}{\frac{1}{5}} = \frac{1}{3} \div \frac{1}{5} = \frac{1}{3} \times \frac{5}{1} = \frac{5}{3}$ ✓

(a) $\frac{5}{3} = \left| \frac{\frac{1-4}{1+4}}{\frac{1}{5}} \right| = \left| \frac{\frac{-3}{5}}{\frac{1}{5}} \right| = \frac{3}{5} \div \frac{1}{5} = \frac{3}{5} \times \frac{5}{1} = \frac{3}{1}$

Use the following information to answer the next <u>five (5)</u> questions:

Consider a fictional country, Rosa, which produces rose-infused cosmetic products. The domestic demand and supply for cosmetics are:

Domestic Demand: $Q_d = 20 - 2P$

Domestic Supply: $Q_s = 3P$

The price is measured in Rosarian Dollars ($).

Previously, its cosmetic market was not open to international trade. Suppose now that Rosa decides to open its cosmetic market to imports (i.e. free trade), so that people can buy unlimited quantities of cosmetics from abroad. The world price of cosmetics is $2 per unit.

EASY:
INTER-
PRETATION
OF GRAPH

13. Which of the following statements is <u>**WRONG**</u> about the interpretation of the labeled areas in the following graph?

↳ LOOKING FOR FALSE

$20 - 2P = 3P$
$20 = 5P$
$4 = P_{Dom}$
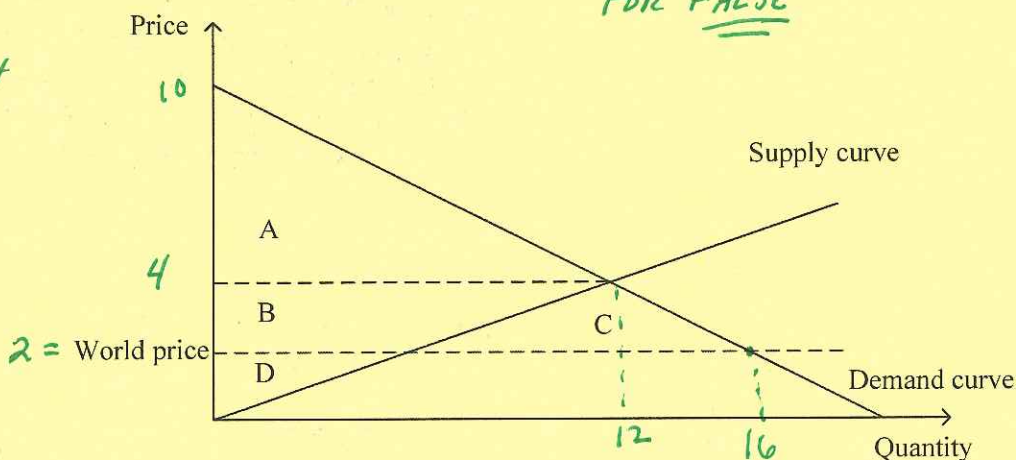
a. Area A is the consumer surplus before free trade is implemented. *TRUE*
b. Area A+B is the consumer surplus after free trade is implemented. *✗ A+B+C = CS_trade FALSE*
c. Area C is the increase in total surplus due to the implementation of free trade. *TRUE*
d. Area B is the surplus that consumers "capture" from producers after free trade is *TRUE* implemented.

(Continue on next page)

14. Due to complaints from domestic producers, the government of Rosa is considering imposing a tariff on imported cosmetics that will increase the price of cosmetics in Rosa to $3. What will be the change in consumer surplus due to the implementation of this tariff?

a. Consumer surplus will decrease by $15.
b. Consumer surplus will decrease by $49.
c. Consumer surplus will increase by $64.
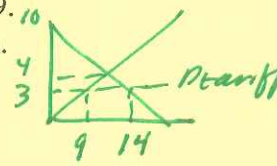d. Consumer surplus will decrease by $8.

Handwritten:

if $P=3 \Rightarrow Q^D = 20-2(3) = 14$

$Q^S = 3(3) = 9$

Imports $= 5$

Ptariff

$CS_{tariff} = \frac{1}{2}(7)(14) = 49$

$CS_{open} = \frac{1}{2}(8)(16) = 64$

$\Delta \text{ in } CS = \downarrow $ \$15

10

4
3

9 14

15. Suppose that the government has successfully implemented the tariff from the last question. What is the government's revenue from this tariff?

a. $5
b. $7.50
c. $15
d. $14

*Handwritten:* tariff rev $= (3-2)(5) = $5

16. Alternatively, the government can implement a quota to achieve their goal of increasing producer surplus by the same percentage as they accomplished with the tariff. What quota level should the government implement if it wishes to replace the tariff with an import quota that results in the same impact on domestic producers? The import quota should be:

a. 7 units
b. 3 units
c. 5 units
d. 2 units

17. What is the value of the deadweight loss resulting in switching from the more efficient foreign producers of the good to the less efficient domestic producers of the good when the import quota described in the last question is implemented?

a. $3.00
b. $1.50
c. $0.75
d. $2.50

Handwritten graph:

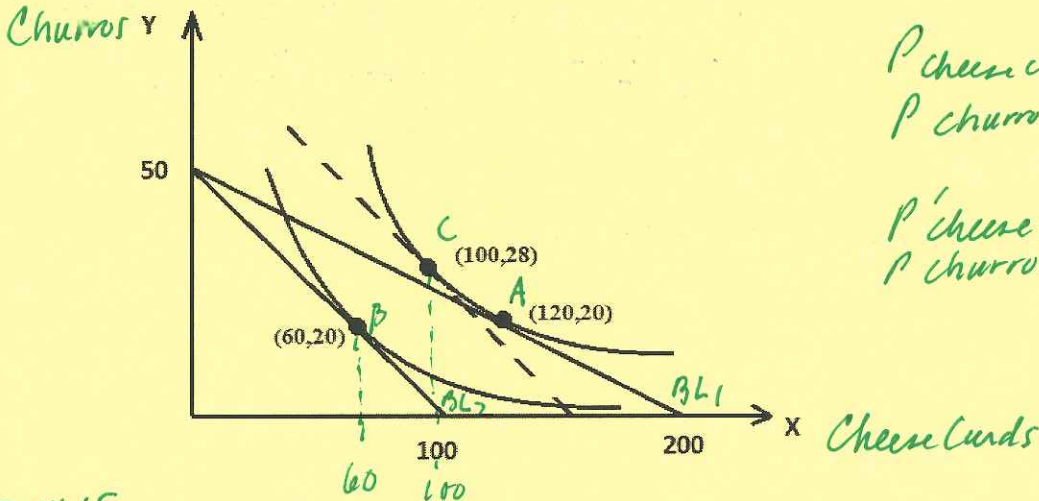10   Son

4
3
2   Pworld
             PDom

6 9
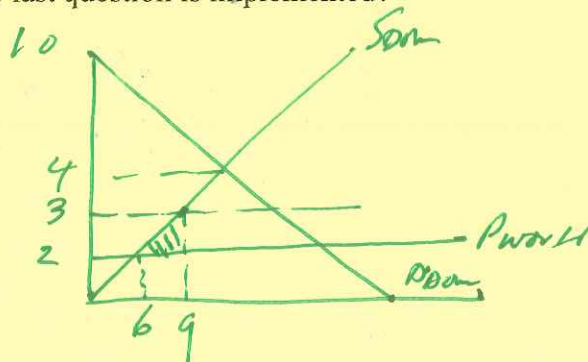
DWL of less efficient producer

$= \frac{1}{2}(3-2)(9-6)$

$= \frac{1}{2}(1)(3) = 1.50

Use the following information to answer the next <u>three (3)</u> questions:

Jerry has 100 dollars that he can only spend on two goods: cheese curds (X) and churros (Y).
Each cheese curd costs $0.50, and each churro costs $2.
Suppose that the price of one cheese curd increases to $1, and the following graph depicts the change in Jerry's optimal bundle due to the price change.
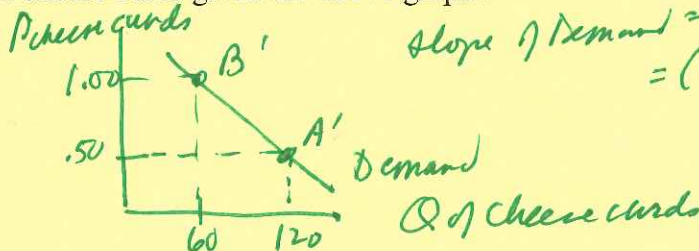
Churros Y

50

C (100,28)

A (120,20)

B (60,20)

BL₂

BL₁

X *Cheese Curds*

100   200
60   100

$P\text{ cheese curds} = 50¢$ } BL₁
$P\text{ churro} = \$2$

$P'\text{ cheese curds} = \$1$ } BL₂
$P\text{ churro} = \$2$

EASY IF YOU HAVE THE CONTE

18. Based on the graph above, find the income effect on cheese curds associated with this price change.

a. -20 for cheese curds
b. 20 for cheese curds
c. 40 for cheese curds
(d.) -40 for cheese curds

Moving from point C to point B : Income Effect
↓ of 40 units of cheese

PREDICTABLE:
EASY IF YOU HAVE THE CONTENT

19. Assume that the demand curve for cheese curds is a straight line. Which of the following equations represents the demand for cheese curds given the above graph?

(a.) P = 1.5 - (1/120)Q ✓
b. P = 3.5 - (1/40)Q X
c. P = 1.75 - (1/80)Q X
d. P = 2.25 - (1/16)Q X

wrong slope

P cheese curds

1.00 — B'

.50 — A' *Demand*

60   120   *Q of cheese curds*

Slope of Demand $= \dfrac{-.5}{60}$
$= \left(-\dfrac{1}{2}\right)\left(\dfrac{1}{60}\right) = \dfrac{-1}{120}$

NOT THAT HARD

20. Given the new price levels and the above graph, what is the minimum total amount of income that Jerry needs in order to return to his original utility level before the price change?

a. $160
(b.) $156
c. $106
d. $100

What is Cost of Bundle C?
Bundle C ⇒ 100 units of X at $1/unit = $100
28 units of Y at $2/unit = 56

Total Income = $156
Needed to Buy Bundle C

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

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

Below is a table depicting the relationship between different output levels and the total cost of producing those output levels for a watch manufacturing company.

Quantity	Total Cost
0	$40
1	$50
2	$62
3	$78
4	$100

(handwritten annotations)
FC   VC
$\Rightarrow Q=0 \Rightarrow TC=FC=40$
40   10
     22
     38
     60

NOT HARD IF YOU KNOW CONTENT

21. If this firm produces 4 watches, what is the average variable cost (AVC) at this production level?

   a. $10 per watch
   b. $15 per watch
   c. $20 per watch
   d. $25 per watch

(handwritten)
When $Q=4$, $VC=60$
$AVC = \dfrac{VC}{Q} = \dfrac{60}{4} = \$15/watch$

EASY

22. What is the average fixed cost when the firm makes 2 watches?

   a. $10 per watch
   b. $20 per watch
   c. $30 per watch
   d. $40 per watch

(handwritten)
$FC = 40$
$Q = 2$
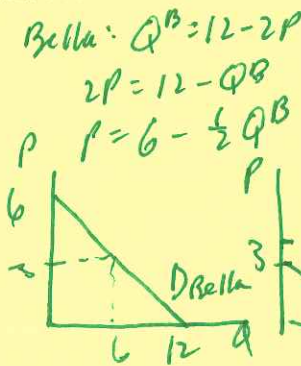$AFC = \dfrac{40}{2} = \$20/watch$

SOME THINKING AND WORK INVOLVED HERE!

23. The market for ice cream consists of two consumers, Bella and Joe. Their individual demand curves for ice cream are given by the following equations where Q is the quantity of ice cream measured in cups and P is the price for each cup of ice cream measured in dollars.
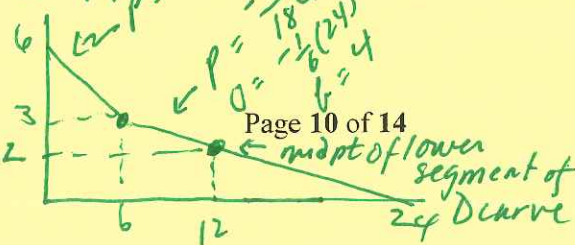
   Bella's demand for ice cream: $Q^B = 12-2P$
   Joe's demand for ice cream: $Q^J = 12-4P$

For what price range is the market demand for ice-cream elastic?

   a. P < $2
   b. $1 < P < $3
   c. $2 < P < $6
   d. P > $6

(handwritten work)
Bella: $Q^B = 12-2P$
$2P = 12-Q^B$
$P = 6 - \frac{1}{2}Q^B$

Joe: $Q^J = 12-4P$
$4P = 12-Q^J$
$P = 3 - \frac{1}{4}Q^J$

$P = 6 - \frac{1}{2}Q^B$
$P = -\frac{3}{18}Q + \frac{1}{18}(24)+6$
$P = 4 - \frac{3}{18}Q$

$P = -\frac{1}{6}(24)+6 = 4$
$Q = b = 4$

D Bella, D Joe, mid pt of lower segment of 24 D curve

24. The following figure shows the cost information for a representative firm selling baseball hats in a perfectly competitive market.
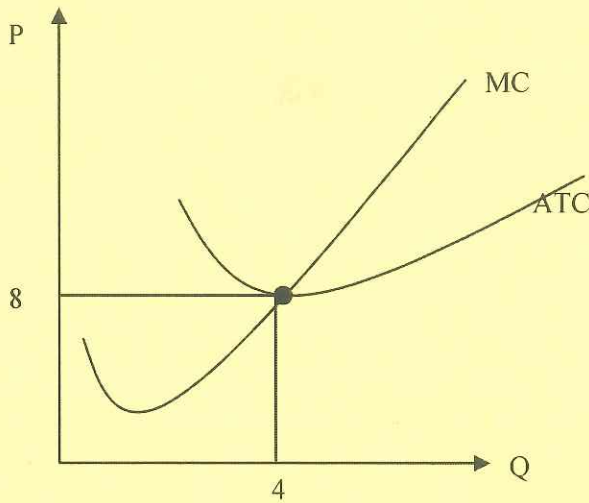
Which of the following statements is **TRUE**?

a. If market price of the baseball hat is $8, firms are making positive economic profit. *Econ Π = 0*

b. In the long run, each firm's production level is greater than 4 baseball hats. *q in LR = 4*

c. If the market price of a baseball hat is currently $10, new firms will enter the market. *True since $\Pi_{SR} > 0$*

d. Firms never produce at a production level lower than 4 baseball hats because that would generate negative economic profit for the firms. *In the short run they will produce provided $P \geq AVC$*

TOUGH
ONE:
ONE OF
THE
HARDETT
ON
EXAM

25. Market research shows that the income elasticity of demand for iPhones is 4, and the price elasticity of demand for iPhones is 2. The cross-price elasticity between iPhones and Samsung Notes is 3.

Per experts' forecasts, the average income level will increase by 5% this year. The price for an iPhone will increase by 5%, while the price for a Samsung Notes will decrease by 5%. Given thsi information and holding everything else constant, what will be the percentage change in the quantity demanded for iPhones this year?

a. Quantity demanded for iPhones will increase by 15%.

b. Quantity demanded for iPhones will decrease by 5%.

c. Quantity demanded for iPhones will increase by 25%.

d. Quantity demanded for iPhones will decrease by 15%.

Start w/ 100 phones for example:

i) $\uparrow$ due to Δ in income = 20% (100) = 20

$$\epsilon_I = \frac{\% \Delta Q_A^D}{\% \Delta Income} = 4 \qquad \frac{\uparrow 20\%}{\uparrow 5\%}$$

$$\epsilon_D = \left| \frac{\% \Delta Q_A^D}{\% \Delta P_A} \right| = 2 \qquad \left| \frac{\downarrow 10\%}{5\%} \right| = 2$$

$$\epsilon_{xy} = \frac{\% \Delta Q_x^D}{\% \Delta P_y} = 3$$

ii) $\downarrow$ due to $\uparrow$ in price of iPhone = (-10%)(100) = -10

$$\frac{-15\%}{-5\%} = 3$$

iii) $\downarrow$ due to $\downarrow$ in price of Samsung Note = (-15%)(100) = -15

$\downarrow$ in Q° overall is 5 phones or 5% ✓

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

In the computer industry, each firm's cost functions are given by the following equations where q is the quantity produced by the firm:

$$TC = \frac{1}{2}q^2 + 32$$
$$MC = q$$

Assume that the industry is perfectly competitive, and that all firms are identical.
The market demand for computers is P = 80 - Q where P is the price per computer and Q is the quantity demanded in the market.

CAN YOU FIND MARKET SUPPLY?

26. Suppose the computer industry is in short run equilibrium, and there are currently seven firms competing in the market. Given this information and holding everything else constant, what is the short run equilibrium market price?

    a. $5 per computer
    b. $10 per computer
    c. $15 per computer
    d. $20 per computer

SOME WORK

27. Suppose the computer industry is operating at its long run equilibrium. How many firms will be in this industry if the industry is in long run equilibrium?

    a. 7 firms
    b. 8 firms
    c. 9 firms
    d. 10 firms

Handwritten work:

SR Equilibrium:
D: P = 80 − Q
S: P = $\frac{1}{7}$Q

80 − Q = $\frac{1}{7}$Q
80 = $\frac{8}{7}$Q
Q = 80($\frac{7}{8}$) = 70
P = $\frac{1}{7}$(70) = 10

S_{mkt} P = $\frac{1}{7}$Q

7 firms → 2 ... 2(7) = 14
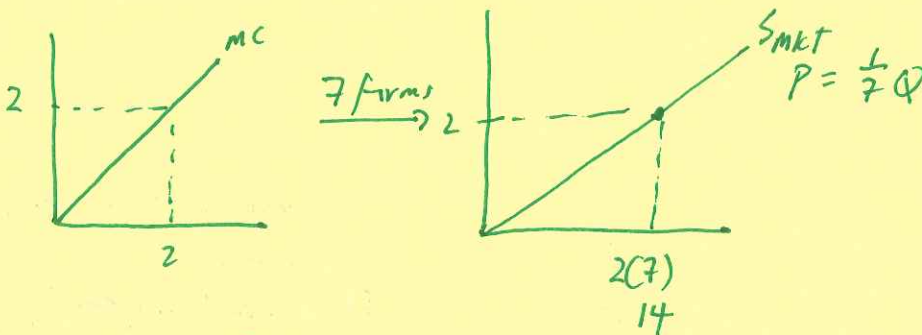
LR Equilibrium
MR = MC = ATC for the firm
MC = q
ATC = $\frac{1}{2}$q + $\frac{32}{q}$

q = $\frac{1}{2}$q + $\frac{32}{q}$
$\frac{1}{2}$q = $\frac{32}{q}$

q² = 64
q = 8
MC = 8 = P
if P = 8 ⇒ P = 80 − Q
8 = 80 − Q
Q_{mkt} = 72

Q_{mkt} = # of firms
$\frac{Q_{firm}}{72}$ ... $\frac{72}{8}$ = 9 = # of firms

Use the following information to answer the next <u>two (2)</u> questions:

The prices for certain goods from 2007 to 2009 are described in the table below:

Year	Price of one egg	Price of one apple	Price of one melon	Price of one avocado
2007	$0.30	$1.00	$2.00	$1.00
2008	$1.50	$0.50	$4.00	$2.00
2009	$0.50	$1.00	$3.00	$2.00

Suppose that a typical consumer consumes a basket of 10 eggs, 6 apples, 5 melons and 5 avocados. Use the year 2007 as the base year to answer the next two questions.

A LOT OF WORK, BUT NOT HARD

28. What is the CPI for the year 2009 when measuring the CPI on a 100 point scale?

   #29

   a. 3600
   b.)150
   c. 120
   d. 90

   $\%\Delta \text{ in nom income} = \left[\dfrac{360-100}{100}\right] 100$

   $= 260\%$

SOME WORK, BUT NOT HARD

29. Suppose that real income grows by 20% from 2007 to 2008, and then by 100% from 2008 to 2009. What is the percentage increase in nominal income from 2007 to 2009?

   a. 115%
   b. 80%
   c. 360%
   d.)260%

$\begin{array}{r}2\\24\\15\\\hline120\\24\\\hline360\end{array}$

Year	Cost of Mkt Basket
2007	$(10)(.3) + 6(1) + 5(2) + 5(1) = 3 + 6 + 10 + 5 = 24$
2008	$(10)(1.5) + 6(.5) + 5(4) + 5(2) = 15 + 3 + 20 + 10 = 48$
2009	$(10)(.5) + 6(1) + 5(3) + 5(2) = 5 + 6 + 15 + 10 = 36$

#29

Year	CPI BY 2007
2007	$\frac{24}{24}(100) = 100$
2008	$\frac{48}{24}(100) = 200$
2009	$\frac{36}{24}(100) = \frac{3}{2}(100) = 150$

END OF EXAM

Year	nom Income	real Income
2007	100	100
2008		120
2009	360	240

↓ ↑20%
↓ ↑100%

$real = \dfrac{nom}{CPI}(scale)$

$240 = \dfrac{nom}{150}(100)$ → $\dfrac{240(150)}{100} = nom$

$360 = nom$

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DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!