Economics 101	Name ___ANNOTATED KEY___
Fall 2016	TA Name _____
November 22, 2016	Discussion Section Number _____
Second Midterm	Student ID Number _____

Version 1
READ THESE INSTRUCTIONS CAREFULLY.
DO NOT BEGIN WORKING UNTIL THE PROCTOR TELLS YOU TO DO SO

You have 75 minutes to complete this exam. The exam consists of 9 binary response questions worth 2 points each and 20 multiple choice questions worth 4 points each for a total of 98 points. You will receive two points if you accurately and completely provide your name, ID number, discussion section number, version number, and TA name on the scantron sheet AND this exam booklet. Thus, the total number of points on the exam is 100. Answer all questions on the scantron sheet with a #2 pencil. There are 20 printed pages in this exam, including this cover sheet.

WARNING: NO COMMUNICATION OR CALCULATING DEVICES, OR FORMULA SHEETS ARE ALLOWED. NO CONSULTATION AND CONVERSATION WITH OTHERS ARE ALLOWED WHILE YOU ARE TAKING EXAM OR IN THE EXAM ROOM. PLAGIARISM IS A SERIOUS ACADEMIC MISCONDUCT AND PUNISHABLE TO THE FULLEST EXTENT.

PICK ONLY ONE 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. You can find the discussion numbers below on 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 on the top of this page.

- If you believe 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 proctors.

Discussion Sections (Sorted by TA):

Section Number	Time	Room	TA	Section Number	Time	Room	TA
335	F 11:00 – 11:50	Van Hise 379	Hans Schwarz	332	Th 15:30 – 16:20	Soc. Sci. 6322	Sam Schreiber
339	F 12:05 – 12:55	Van Hise 205	Hans Schwarz	336	F 11:00 – 11:50	VanVleck B219	Sam Schreiber
331	F 9:55 – 10:45	Van Hise 395	Saber Ahmadi	341	F 12:05-12:55	VanVleck B325	Sam Schreiber
333	F 13:20 – 14:10	Van Hise 207	Saber Ahmadi	344	F 9:55 – 10:45	Ingraham 215	Sam Schreiber
337	F 14:25 – 15:15	Soc. Sci. 5231	Saber Ahmadi	334	F 13:20 – 14:10	Van Hise 140	Shuhei Otani
346	F 12:05-12:55	Sterling 2425	Saber Ahmadi	340	F 14:25 – 15:15	Soc. Sci. 6203	Shuhei Otani
330	F 8:50 – 9:40	Sterling 2329	Yixi Yang	342	F 9:55 – 10:45	Sterling 2319	Shuhei Otani
338	F 9:55 – 10:45	Sterling 2333	Yixi Yang	343	F 11:00 – 11:50	Sterling 2333	Shuhei Otani
345	F 11:00 – 11:50	Sterling 2425	Yixi Yang				

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DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!

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 QUESTIONS (9 QUESTIONS WORTH 2 POINTS EACH)

NOT HARD

1. Assume that the market for milk is perfectly competitive in Wisconsin and that it is currently in its long-run equilibrium. A recent study proves that drinking milk reduces the risk of a cardiovascular disease, so the demand for milk increases permanently. Given this information and holding everything else constant, what happens to the price of milk in the short run and in the long run? *returns to original level* *↦ PS*

    a.) The price of milk increases in the short run, but the price will return to the original long run equilibrium level over time.

    b. The price of milk increases in both the short run and the long run *X* relative to the initial long run equilibrium price.

EASY

2. Consider the market for electricity in Madison. The demand for electricity is relatively inelastic due to the lack of substitutes available. The price elasticity of supply is 3.1. Given this information, if the government decides to implement a $5 excise tax on Madison electricity companies, who will bear more of the economic burden of this excise tax?

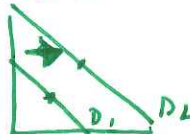   a. Producers

    b.) Consumers
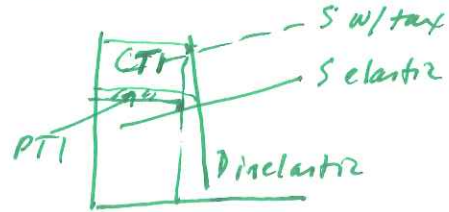
3. Imagine that you have been hired as the new CEO of Budget Bicycle Center in Madison, WI and that you must set up a new sale price for the bicycles. The demand for bicycles is linear and given by the equation:

Demand: $Q^d = 25 - P - 0.2\ I$

where Q^d is quantity demanded, P is price, and I is the mean income of households in Madison. You also know that the old price of the bicycles was maximizing total revenue one year ago, and that the income of households in Madison has decreased throughout 2016. What should you do to the sale price of bicycles if you want to maximize total revenue for Budget Bicycle Center?

a. Increase the price of the bicycles.

b. Decrease the price of the bicycles.

as $I\downarrow$, $Q^d\uparrow$ ⟹ bikes are inferior good

4. Molly is an economics student and needs to calculate the real price of a pound of coffee in 2001 using 1995 as the base year. She collects information on the cost of the market basket in 1995 through 2001 and obtains the nominal price of a pound of coffee in 2001. She then calculates the real price of coffee, using 100 as her scale. After turning in her assignment, the professor tells her that she understated the market basket cost in 1995. Will her calculated real price increase or decrease with this adjustment?

a. Increase

b. Decrease

$$CPI_{2001} = \frac{\text{Cost of mkt basket in 2001}}{\text{Cost of mkt basket in 1995}} = \#$$

$$CPI'_{2001} = \frac{\text{Cost of mkt basket in 2001}}{\text{Cost of mkt basket in 1995}\uparrow} = \#\#$$

$$\#\# < \#$$

$$\text{real} = \frac{\text{nom (scale)}}{CPI}$$

$$\text{real initially} = \frac{\text{nom (scale)}}{\#} \quad vs \quad \text{real after correction} = \frac{\text{nom (scale)}}{\#\#}$$

$$\text{real}\uparrow \text{ after correction}$$

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5. Assess whether the following statement is true or false: "A firm will not choose to produce if the price of its product is lower than the average variable cost of producing the product."

   a. **True.**
   b. False.

perfect substitutes

6. Yixi only eats energy bars or bowls of cereal in the morning. Either one bowl of cereal or three energy bars will make him equally happy. Assume that the price for one bowl of cereal is 5 dollars and the price for one energy bar is 2 dollars. Given this information and holding everything else constant, what will he buy for breakfast this month?

   a. **Yixi will buy only cereal this month for breakfast.**
   b. Yixi will buy only energy bars this month for breakfast.

Yixi will choose the cheaper alternative since the two goods are perfect substitutes

INTERPRETING
DATA IN
THE
CONTEXT
OF CONTENT:
EASY IF
YOU
HAVE THE
CONTENT #7

7. Consider the market for mushrooms in Japan. The world price is $x for each pound of mushrooms. If the market is open to trade, then Japan imports y pounds of mushrooms. However, if an import quota is set at z pounds, the domestic price will be $w per pound. Assume that the domestic demand and supply curves are linear, and that x, y, z, and w are all positive numbers. Given the above information, the domestic price of mushrooms if the market is closed to trade <u>must</u> be:

   a. Between $x and $w.
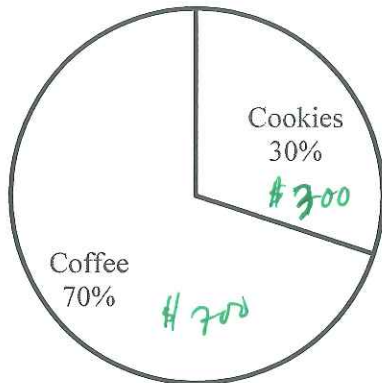   b. **Above $w.**

energy bars

10 IC
5 BL₁

2 4 5   10 cereal

*$w
$x   Pworld
z
y*
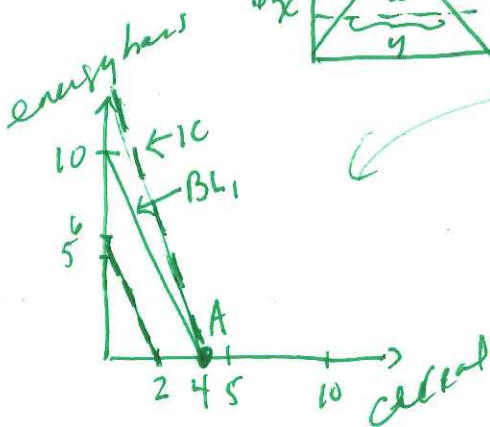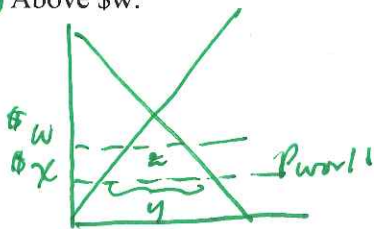
*For example
I = $20
P cereal = $5
P energy bar = $2   } BL₁*
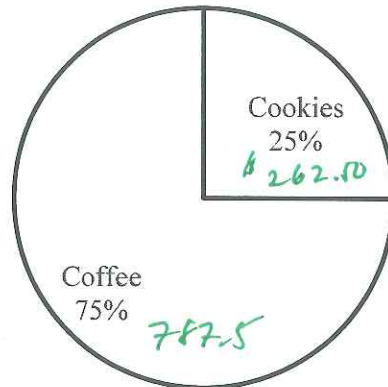
EASY IF YOU DO THE WORK

8. In the following graphs, you are presented with the percentage of total revenue in 2014 and 2015 that was generated by the two main products that a local cafeteria sells: coffee and cookies.

Percentage of total revenue, 2014   Percentage of total revenue, 2015

Cookies 30% $300
Coffee 70% $700

Cookies 25% $262.50
Coffee 75%   787.5

Total Revenue 2014: $ 1,000   Total Revenue 2015: $ 1,050

$$\frac{262.50}{4} = 262.50 \quad \times 3$$
$$787.5$$

Given all the information presented above, which product had the biggest percentage change between 2014 and 2015 in terms of revenue, in absolute value?

a. Coffee.

b. Both products had the same percentage change in revenue when measured in absolute value.

$$\%\Delta cookies = \left|\frac{262.50 - 300}{300}\right| (100\%)$$

$$= \left|\frac{-37.5}{3}\%\right|$$

$$= 12.5\%$$

$$\%\Delta coffee = \left|\frac{787.5 - 700}{700}\right| (100\%)$$

$$= \left|\frac{87.5}{7}\%\right|$$

$$= 12.5\%$$

They are equal

9. The Gini coefficient is an index that is used to measure income inequality in a nation. The Gini coefficient can take the values in the range between 0 and 1. As the value of the Gini coefficient increases toward 1, this represents more income inequality in a given country. In the following scatter plot, the GDP per capita (on the X-axis) is measured in U.S. dollars and the Gini coefficient (measured on the Y-axis and using a 100 point scale rather than a 1 point scale) in the year 2010 are graphed as dots for 73 countries. The dotted line in the graph provides a linear relationship indicating the "best fit" for this data if you are describing it with a single linear line.

GDP per capita and Gini coefficient for a sample of countries, 2010

more income inequality

less income inequality
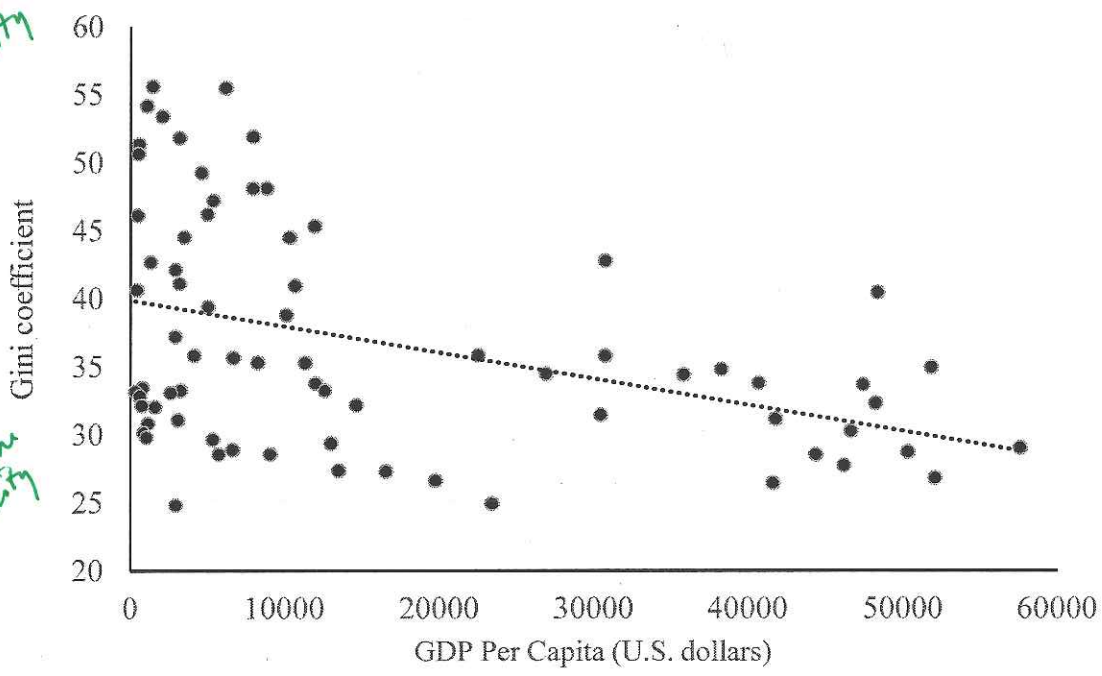

According to the graph, there appears to be:

a. A positive relationship between degree of income inequality and GDP per capita.

b. A negative relationship between degree of income inequality and GDP per capita.

MULTIPLE CHOICE QUESTIONS (20 QUESTIONS WORTH 4 POINTS EACH)

The following graph depicts Noel's optimal consumption problem under three different budget constraints. Initially, his budget constraint was given by BL1. A change in the price of X caused his budget line to pivot to BL2; his income remained the same. In the diagram, BL stands for budget lines and IC stands for indifference curve.
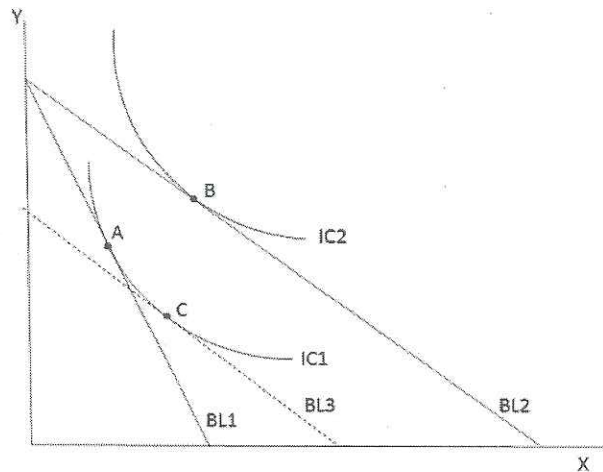
Use the provided graph and information to answer the next TWO (2) questions.

EASY

10. Moving from BL1 to BL2, the price for good X ___↓___. The income effect of the change in the price of X is captured by the movement from bundles _C to B_.

    (a.) decreases; C to B.

    b. decreases; A to C✗

    c. increa✗es; A to B.

    d. increa✗es; C to B.

NOT HARD

11. Which of the following statements is **false**?

    a. After the change in the price of X, Noel achieves a higher level of utility. *TRUE*

    b. Bundles B and C were not affordable at the original prices. *tRUE*

    (c.) Considering only the substitution effect, Noel would consume more of Y and less of X. *FALSE*

    d. Considering only the income effect, both X and Y are normal goods for Noel. *TRUE*

Use the following information for the next __TWO (2)__ questions:

Anthony is writing a research paper on consumer spending habits and wants to analyze the price of a tennis racquet throughout the previous 20 years. Anthony gathered the following information:

Year	CPI	Nominal Price of Tennis Racquet	*Real price*
1996	100	$300	300
2006	150	$350	$\frac{350}{150}(100) = \frac{700}{3} = 233\frac{1}{3}$
2016	200	$400	$\frac{400}{200}(100) = 200$

NOT HARD 12. Which of the following statements is true?

    a. The real price of a tennis racquet decreased from 2006 to 2016. T

    b. The real price of a tennis racquet increased from 1996 to 2006. F

    c. The real price of a tennis racquet increased from 1996 to 2016. F

    d. The real price of a tennis racquet might have increased or decreased depending on the determination of the base year. F

NOT HARD ? PREDICTABLE 13. Suppose you want to use 2006 as the base year in your calculations. What is the real price of a tennis racquet in 2016 using 2006 as the base year?

    a. The real price of a tennis racquet in 2016 using 2006 as the base year is $200.

    b. The real price of a tennis racquet in 2016 using 2006 as the base year is $266.66.

    c. The real price of a tennis racquet in 2016 using 2006 as the base year is $300.

    d. The real price of a tennis racquet in 2016 using 2006 as the base year is $533.33.

Year	CPI BY 1996	CPI BY 2006
1996	100	
2006	150	$\frac{150}{150}(100) = 100$
2016	200	$\frac{200}{150}(100) = \frac{400}{3}$

$\frac{350}{150}(100)$ → 3

$\text{real price in 2016} = \frac{400}{\left(\frac{400}{3}\right)}(100)$

$= (400)(100)\left(\frac{3}{400}\right) = 300$

10

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Use the following information for the next TWO (2) questions:

PLUG Y
CHUG :
REVIEW OF
HOMEWORK
#4 WORK

14. Jake can decide whether to consume pizzas (x) or hamburgers (y). The marginal utility that Jake receives from consuming pizza and hamburgers is given by the following equations:

$$MUx = 2/x$$
$$MUy = 1/y$$

Consider that Jake's income is $72, the price of x is $2 and the price of y is $6. Which of the following consumption bundles is optimal for Jake?

a. (x, y) = (0, 12)
b. (x, y) = (12, 8)
c. (x, y) = (24, 4) *(circled)*
d. (x, y) = (36, 0)

$$\left|\frac{MUx}{MUy}\right| = \left|\frac{P_x}{P_y}\right|$$

slope of IC = slope of BL at optimal consumption bundle

$$\frac{\frac{2}{x}}{\frac{1}{y}} = \frac{2}{6}$$

EASY

15. Jake's income decreases to $48 while the price of x and the price of y are unchanged from the previous question. Given this information, which of the following consumption bundles (x, y) can Jake **NOT** afford?

a. (9, 5)
b. (5, 6)
c. (4, 7) *(circled)*
d. (0, 8)

$$\left(\frac{2}{x}\right)(6) = 2\left(\frac{1}{y}\right)$$
$$\frac{12}{x} = \frac{2}{y}$$
$$12y = 2x$$
$$\boxed{6y = x}$$

$I = P_x X + P_y Y$ equation for BL
$$72 = 2X + 6Y$$
$$\boxed{36 = X + 3Y}$$

$I = 48$
$P_x = 2$
$P_y = 6$

use these 2 equations to solve for (X, Y)

a) (9, 5) ⇒ 9(2) + 5(6) = 18 + 30 = 48
   affordable

b) (5, 6) ⇒ 5(2) + 6(6) = 10 + 36 = 46
   affordable

c) (4, 7) ⇒ 4(2) + 7(6) = 8 + 42 = 50
   NOT AFFORDABLE

d) (0, 8) ⇒ 0(2) + 8(6) = 48
   affordable

$$36 = 6Y + 3Y$$
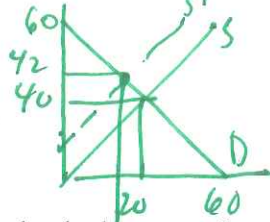$$36 = 9Y$$
$$4 = Y$$
$$6(4) = X$$
$$X = 24$$
$$(X, Y) = (24, 4)$$

Use the following information for the next __TWO (2)__ questions:

In an attempt to reduce the number of trees cut down in Dane, Wisconsin the local government has proposed the implementation of an excise tax on paper. The market demand and market supply for paper are given by the following equations, where P is the price of a ream of paper and Q is the quantity:

> Demand: P = 60 - Q
>
> Supply: P = 2Q

[handwritten graph with axes labeled 60, 42, 40 on vertical and 20, 60 on horizontal; curves S and D]

[handwritten:]
$$60 - Q = 2Q$$
$$60 = 3Q$$
$$20 = Q$$
$$P = 2(20) = 40$$
$$CS_{Before\ tax} = \tfrac{1}{2}(20)(20) = \$200$$

NOT HARD 16. If the proposed excise tax is $6, what is the new value of consumer surplus after the imposition of this excise tax?

   a. $150

   b. $162 *(circled)*

   c. $184

   d. $324

[handwritten:]
$$60 - Q = 2Q + 6$$
$$54 = 3Q$$
$$18 = Q$$
$$P = 60 - 18 = 42$$
$$CS_{after\ tax} = \tfrac{1}{2}(60 - 42)(18)$$
$$= \frac{(18)(18)}{2} = 9(18)$$

[right margin handwritten:]
$$\begin{array}{c} 18 \\ \underline{\times\ 9} \\ 162 \end{array}$$

NOT HARD 17. Instead of specifying the excise tax amount, suppose now that the policy calls for an excise tax that will reduce the consumption of paper to 15 reams. What is the size of the excise tax required to reach this consumption goal?

   a. $6 per ream of paper

   b. $8 per ream of paper

   c. $11 per ream of paper

   d. $15 per ream of paper *(circled)*

[handwritten graph with S and D curves, values 60, 40, $P_e^T = 45$ (circled), $P_{net} = 30$ (circled), 15, 20, 60 on axis]
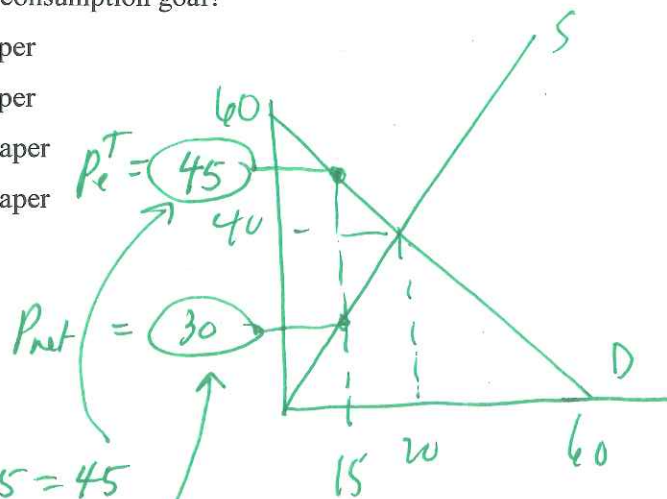
[handwritten:]
$$\text{if } Q = 15$$
$$D: \Rightarrow P = 60 - 15 = 45$$
$$S: \Rightarrow P = 2(15) = 30$$
$$P_e^T - P_{net} = \text{amount of tax}$$
$$45 - 30 = \$15/\text{unit} = \text{amt of tax}$$

13

Handwritten at top:
$60 - Q = \frac{1}{2}Q + 15$
$45 = \frac{3}{2}Q$
$\frac{2}{3}(45) = Q$
$30 = Q$

Handwritten graph labeled with axis values 60, 30, 15, 10 and 30, 50, 60; curves labeled S_{dom}, D_{dom}, P_{world}
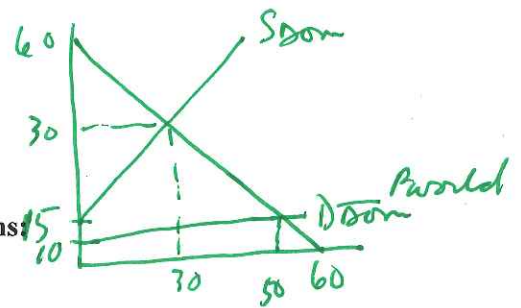
Use the following information for the next THREE (3) questions:

Consider the market of soy beans in the U.S. The world price of soy beans is $10. The domestic demand and supply curves are given as follows, where Q is the number of units of soy beans and P is the price per unit:

Handwritten:
$TS \text{ w/ free trade} = \frac{1}{2}(60-10)(50)$
$= \frac{1}{2}(50)(50)$
$= \frac{2500}{2} = \$1250$

Domestic demand: P = 60 – Q

Domestic supply: P = 1/2 Q + 15

Handwritten:
$\frac{1}{2}Q = P - 15$
$Q = 2P - 30$

Left margin handwritten: SOME WORK OR IF YOU UNDERSTAND CONCEPTS FAIRLY EASY

18. Which of the following statements is **true**?

   a. Total surplus with free trade in this economy is equal to $2,500. *X = $1250*

   b. The government tariff revenue will be equal to $375 if the government implements a tariff of $25 per unit of soy beans in this economy. *This is a lot of work, I'm checking other answers first X*

   c. A tariff of $5 on soy bean imports will not cause any deadweight loss in the domestic soy bean market. *will cause some DWL*

   (d.) A subsidy of $5 per unit of soybeans to domestic producers in this market will not cause any deadweight loss in the domestic soy bean market. *True*

Left margin handwritten: NOT TOO BAD

19. The government imposes a tariff to restrict the amount of imports to 15 units of soy beans. How much is the government tariff revenue when this policy is implemented?

Handwritten:
$Q^D - Q^S = 15$
$(60 - P) - (2P - 30) = 15$
$90 - 3P = 15$
$75 = 3P$
$25 = P_{tariff}$
$\text{Tariff Rev} = (25 - 10)(15) = \$225$

Handwritten right side:
#18 (b):
if tariff ↑ $25 ⟹ P = 35
$Q^S_{dom} = 40$
$Q^D_{dom} = 25$ ⟹ WAIT! NO IMPORTS
P @ $35 > P_{closed} ↑ @ $30
∴ No tariff revenue !!

   a. $0

   b. $150

   (c.) $225

   d. $375

Left margin handwritten: HARDER

20. Unexpected bad weather in Africa and Japan cause the world price of soy beans to rise to $75. Given this statement and assuming the initial situation, which of the following statements is **false**?

   a. U.S. will now export 120 units of soy beans to the rest of the world. *TRUE*

   b. Total surplus in the domestic soy bean market will increase to $3,600. *TRUE*

   c. The implementation of a tariff of $15 on soy bean imports will not cause any deadweight loss in the domestic soy bean market. *TRUE*

   (d.) A subsidy of $15 per unit to local producers will not cause any deadweight loss in the domestic soy bean market. *FALSE*

Handwritten graph labeled 75, 60, Import, S_{dom}, D_{dom}, 15, 90 120, "Not to scale"
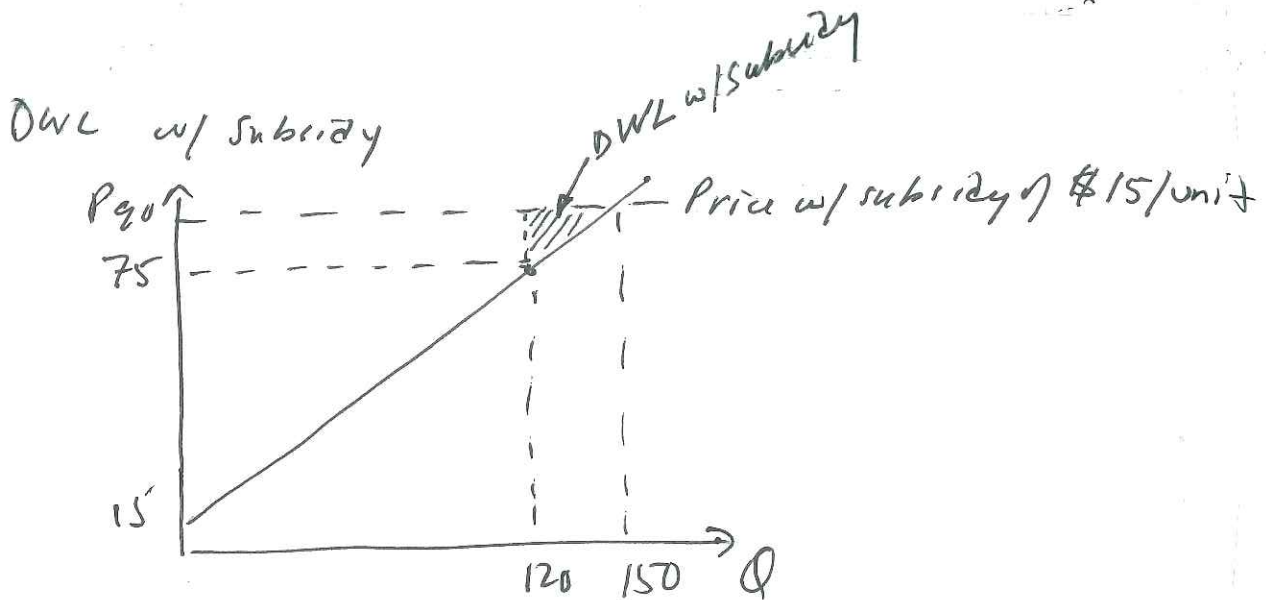
14

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$$TS = 15(90) + \tfrac{1}{2}(15)(30) + \tfrac{1}{2}(60-15)(90)$$

$$= 1350 + 225 + (45)(45) +$$

$$= 1350 + 225 + 2025$$

$$
\begin{array}{r}
45 \\
45 \\
\hline
225 \\
188 \\
\hline
2025 \\
1350 \\
\hline
3375 \\
225 \\
\hline
3600
\end{array}
$$

DWL w/ Subsidy

At $P_{world} = 75 \Rightarrow$

Price $\uparrow$ 75 $\Rightarrow Q^D$ by all
consumers $= 120$

$Q^S = 120$

if $P \uparrow$ due to gov't intervention
then too much is produced $\Rightarrow$
DWL

15

21. An economic analyst has concluded that the cross-price elasticity of good X with respect to Y is 0.5 and that the income elasticity of good X is 1.5. Then, the analyst can conclude that:

    a. X is a normal good, and X and Y are substitutes.
    b. X is an inferior good, and X and Y are substitutes.
    c. X is a normal good, and X and Y are complements.
    d. X is an inferior good, and X and Y are complements.

(handwritten annotations:) $E_{xy} > 0$ as $P_y \uparrow$, $Q_x^0 \uparrow$ x & y are substitutes
$E_I > 0$ as $I \uparrow$, $Q_x^0 \uparrow$ X is normal

(margin: A FUN ONE!)

22. Liam always consumes shoes in pairs (left shoes and right shoes are **perfect complements** in consumption for him) and in Liam's world all the pairs of shoes are the same style. Liam has recently inherited 2 left shoes from his one-legged uncle. Assume the unit price for left shoes is $6, while the unit price for right shoes is $2. If his budget for shoes is $12, which of the following bundles is an optimal purchase plan for Liam?

    a. 2 left shoes.
    b. 6 right shoes.
    c. 3 right shoes and 1 left shoe.
    d. 2 right shoes and 2 left shoes.

(handwritten annotations:) Already has 2 L shoes — So he starts by getting 2 R shoes → cost $4
He has $8 leftover → he can buy 1 L & one more R
⇒ 3 R shoes, 1 L shoe

(margin: SOME THOUGHT: NOT TOO BAD)

23. A shoe factory has a total cost function given by the following equation:
$$TC = 5q^2 + 4q$$
where q represents the number of shoes produced in the factory. Assume that partial units of pairs of shoes can be produced.

The only input of production is labor, and the wage of each worker is $7. Using this information and the total cost function, how many workers does the factory need to produce 2 shoes?

    a. 2 workers
    b. 3 workers
    c. 4 workers
    d. There is not enough information provided to solve this question.

(handwritten annotations:) $q = 2 \Rightarrow TC = 5(2)^2 + 4(2)$
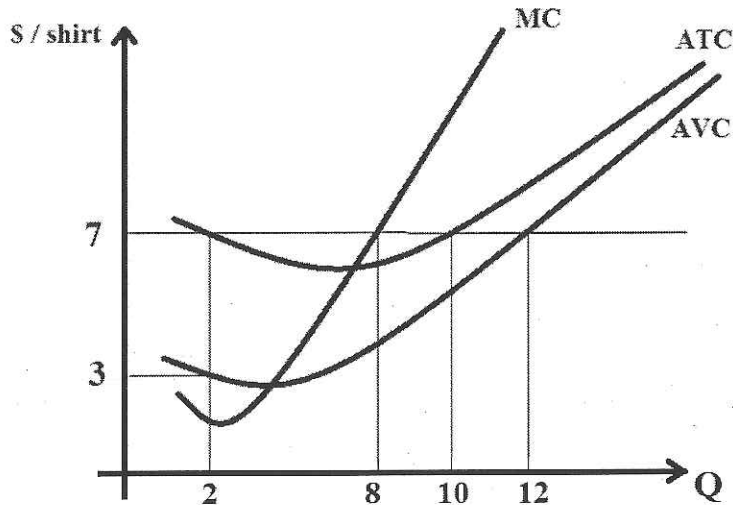$= 5(4) + 8$
$= 28$
So if TC = 28 & each worker costs $7 ⇒ then firm hired 4 workers

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DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!

Use the following information for the next <u>THREE (3)</u> questions:

The following graph presents the MC, ATC, and AVC curves of a factory that produces shirts in a perfectly competitive market.

24. The current price of shirts is $7. Which is the optimal production of shirts in the short run?

    a. 2 shirts
    b. 8 shirts
    c. 10 shirts
    d. 12 shirts

25. The price of shirts is still $7. What will happen to the price, to the number of firms in the industry, and to the individual production of each firm in the long run compared to the short run?

    a. The price of shirts, the number of firms in the industry and the individual production of each firm will increase.
    b. The price of shirts will not change, the number of firms in the industry will increase and the individual production of each firm will decrease.
    c. The price of shirts will not change, the number of firms in the industry will decrease and the individual production of each firm will increase.
    d. The price of shirts and the individual production of each firm will decrease, while the number of firms in the industry will increase.

    $P_{LR} \downarrow, q_{LR} \downarrow, Q_{LR} \uparrow, \# \text{ of firms} \uparrow$

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26. Using the graph, what are the total costs of the firm at Q = 12?

   a. $84

   b. $92

   c. $96

   d. There is not enough information provided to answer this question.

At Q = 12

$$TC = FC + VC$$
$$TC = 8 + 12(7)$$
$$TC = 8 + 84 = {}^{\$}92$$

Can find FC at Q = 2 $\Rightarrow$ AFC = ATC - AVC
                                AFC = 7 - 3 = 4

$$FC = AFC \cdot Q$$
$$FC = 4(2) = 8$$

FC is constant at every Q!

28. (b) $\left| \dfrac{\frac{40-20}{60}}{\frac{10-20}{30}} \right| = \left| \dfrac{\frac{1}{3}}{-\frac{1}{3}} \right| = 1$ X

(c) $\left| \dfrac{\frac{4-20}{24}}{\frac{40-20}{60}} \right| = \left| \dfrac{\frac{-16}{24}}{\frac{20}{60}} \right| = \left| \dfrac{-\frac{2}{3}}{\frac{1}{3}} \right| = \frac{2}{3} \div \frac{1}{3} = \frac{2}{3}\left(\frac{3}{1}\right) = 2$ ✓

(d) $\left| \dfrac{\frac{10-20}{30}}{\frac{100-20}{120}} \right| = \left| \dfrac{\frac{-10}{30}}{\frac{80}{120}} \right| = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{3} \div \frac{2}{3} = \frac{1}{3}\left(\frac{3}{2}\right) = \frac{1}{2}$ X

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NOT HARD

27. Fill in the blanks in the following statements with the appropriate words. Note that your answer to (i) must be the same for each of the blanks with this designation.

Consider the market for coffee in a closed, small country where the domestic price of coffee is lower than the world price of coffee. Suppose that the country opens to trade. Then, the country (i) _Exports_ coffee. If the government of the country imposes a quota to reduce the amount of (i) _Exports_ , the producer surplus will (ii) _↓_ compared to the case without the quota.
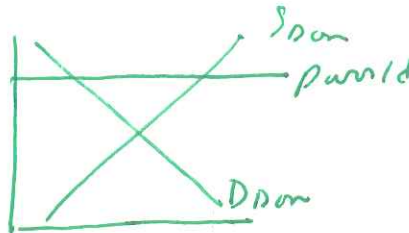
a. (i) imports; (ii) increase
b. (i) imports; (ii) decrease
c. (i) exports; (ii) increase
d. (i) exports; (ii) decrease ✓

S_dom
P_world
D_dom

IF YOU CAN ELIMINATE (a), THEN THIS IS NOT HARD!

28. The arc-elasticity between points X and Y on a demand curve is equal to 2. Suppose that you know that point X is (Q, P) = (20, 20). Which of the following points may be point Y?

a. (Q, P) = (4, 10)   *upward sloping X*
b. (Q, P) = (40, 10)
c. (Q, P) = (4, 40)
d. (Q, P) = (10, 100)

$$2 = \left| \frac{Q_2 - Q_1}{Q_2 + Q_1} \right| \div \left| \frac{P_2 - P_1}{P_2 + P_1} \right|$$

(a) is not downward sloping
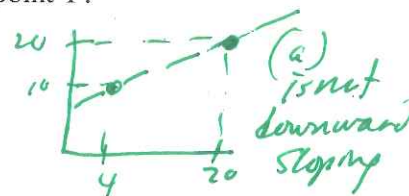
IF YOU KNOW THE FORMULA, THIS IS NOT HARD

29. Find the point (Q, P) in the linear demand curve given by Q = 30 − 2P where the point elasticity of demand is equal to 2.

a. (Q, P) = (7.5, 11.25)
b. (Q, P) = (10, 10)
c. (Q, P) = (15, 7.5)
d. (Q, P) = (20, 5)

$$\text{point } E_D = \left[\frac{1}{-\text{slope}} \right] \left[\frac{P}{Q} \right]$$

$$Q = 30 - 2P$$
$$2P = 30 - Q$$
$$P = 15 - \tfrac{1}{2}Q$$

$$\text{point } E_D = 2 = \left[\frac{1}{\tfrac{1}{2}} \right] \left[\frac{P}{Q} \right]$$

END OF THE EXAM

$$1 = \frac{P}{Q}$$

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DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!