Economics 101	Name _ANNOTATED KEY_
Fall 2014	TA Name _____
November 18, 2014	Discussion Section Number _____
Second Midterm Morning Lecture	Student ID Number _____

Version 4
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 14 binary response questions worth 2 points each and 20 multiple choice questions worth 3.5 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 <u>a #2 pencil</u>. There are <u>18 printed pages</u> in this exam, including this cover sheet.

<u>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.</u>

<u>PICK ONLY ONE BEST ANSWER FOR EACH QUESTION.</u>

<u>How to fill in the scantron sheet and other information:</u>

1. Print your <u>last name, first name,</u> and <u>middle initial</u> in the spaces marked "Last Name," "First Name," and "MI." Fill in the corresponding bubbles below.
2. Print your <u>student ID number</u> in the space marked "Identification Number." Fill in the bubbles.
3. Write <u>the number of the discussion section you've been attending</u> under "Special Codes" spaces ABC, and fill in the bubbles. You can find the discussion numbers below on this page.
4. Write the <u>version number</u> 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 Time):

Section Number	Time	Room	TA
DIS 301	R 3:30-4:20PM	6310 Sewell Social Sciences	Zhihao
DIS 304	R 3:30-4:20PM	4314 Sewell Social Sciences	Chenlai
DIS 306	R 4:35-5:25PM	6112 Sewell Social Sciences	Zhihao
DIS 307	R 4:35-5:25PM	6314 Sewell Social Sciences	Yoshi
DIS 317	F 8:50-9:40AM	222 Ingraham Hall	Adam
DIS 318	F 8:50-9:40AM	1333 Sterling Hall	Emilio
DIS 311	F 9:55-10:45AM	391 Van Hise Hall	Yoshi
DIS 312	F 9:55-10:45AM	386 Van Hise Hall	Adam
DIS 309	F 11:00-11:50AM	B313 Van Vleck Hall	Yoshi
DIS 310	F 11:00-11:50AM	B337 Van Vleck Hall	Zhihao
DIS 315	F 12:05-12:55PM	1407 Sterling Hall	Emilio
DIS 316	F 12:05-12:55PM	222 Ingraham Hall	Yoshi
DIS 305	F 1:20-2:10PM	B313 Van Vleck Hall	Chenlai
DIS 314	F 1:20-2:10PM	B329 Van Vleck Hall	Emilio
DIS 319	F 1:20-2:10PM	383 Van Hise Hall	Zhihao
DIS 302	F 2:25-3:15PM	116 Ingraham Hall	Chenlai
DIS 313	F 2:25-3:15PM	115 Ingraham Hall	Emilio

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 (14 QUESTIONS WORTH 2 POINTS EACH)

1. Suppose a market is initially in equilibrium. At this equilibrium the absolute value of the price elasticity of demand is larger than the absolute value of the price elasticity of supply. If the government imposes an excise tax, then a larger fraction of tax revenue comes out of the _____ surplus.
   a. Consumer
   b. Producer
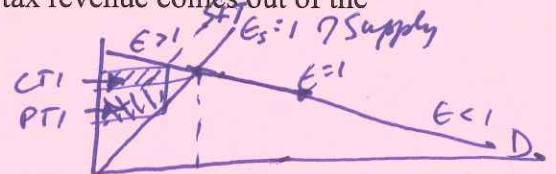
2. Economists can be so obsessive about signs and percentages. Which of the following statements <u>best</u> captures why economists have developed the <u>arc price elasticity of demand formula?</u>
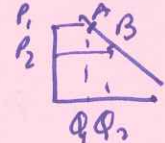   (I) Percentages are so unreliable since your choice of starting point can generate different measures: let's alter the formula so that the calculation is <u>always a positive number.</u>
   (II) Percentages using the same set of numbers can be different depending upon choice of starting point: let's alter the formula to stabilize our measure so that choice of starting point is immaterial.
      a. Statement I is the best statement about the arc elasticity formula.
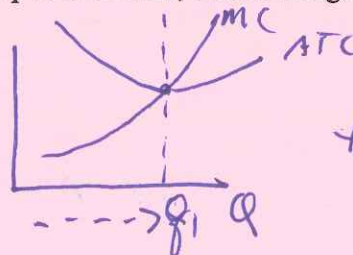   b. Statement II is the best statement about the arc elasticity formula.

3. If marginal cost is below average total cost as output increases, then average total cost is
      a. Decreasing as output increases.
      b. Increasing as output increases.

3

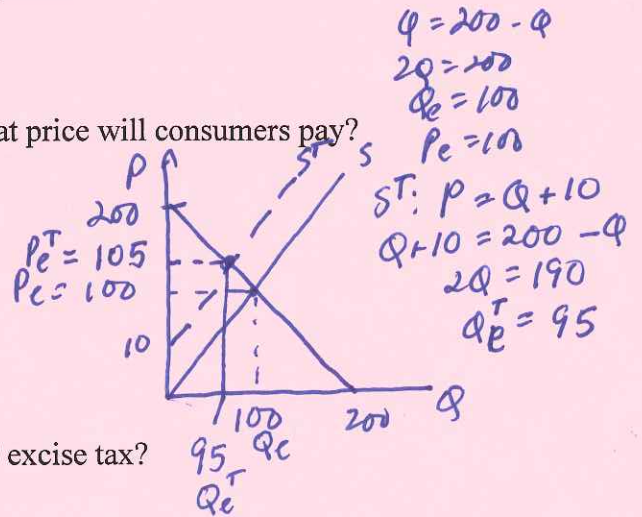Use the following information to answer the next **TWO (2)** questions

Demand and supply in the market for silver plates are given by the following equations where P is the price per silver plate and Q is the quantity of silver plates:

Supply: $P^S = Q$
Demand: $P^D = 200 - Q$

$Q = 200 - Q$
$2Q = 200$
$Q_e = 100$
$P_e = 100$

4. If the government imposes an excise tax of $10, what price will consumers pay?
   a. $105 per silver plate
   b. $110 per silver plate

$S^T: P = Q + 10$
$Q + 10 = 200 - Q$
$2Q = 190$
$Q_e^T = 95$

P
200
$P_e^T = 105$
$P_e = 100$
10

$100 \quad 200 \quad Q$
$95 \quad Q_e$
Q_e^T

5. What is the government's tax revenue under the $10 excise tax?
   a. $1000
   b. $950

Govt tax revenue = [amt $\uparrow$tax/unit][# q units]
govt tax revenue = [$10/unit][95 units]
   = $950

6. Consider a small economy currently closed to trade in the market for wine. The domestic market price is currently below the international price. If the small economy opens to trade with the rest of the world in the wine market, the consumer surplus will __↓__ and producer surplus will __↑__.
   a. Increase; Decrease
   b. Decrease; Increase

CS closed   P   CS trade   S dom
         S dom   P world
                                    PS trade
P dom
ps closed   D dom   D dom
                                    Q
        Q dom
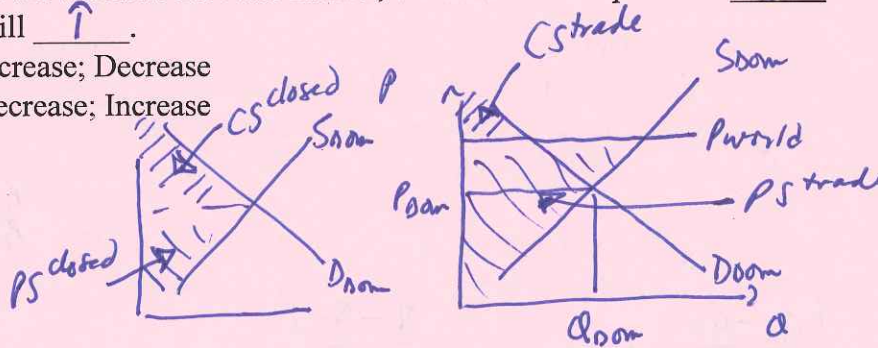
7. Karl runs a factory in a perfectly competitive industry. His engineers tell him his last unit of output cost $50 to produce. The market price for this product is currently $100. Given this information and holding everything else constant, then Karl should
   a. Increase the production of this product.
   b. Decrease the production of this product.

P
       MC
100
50 MR = P   4

q_1 q
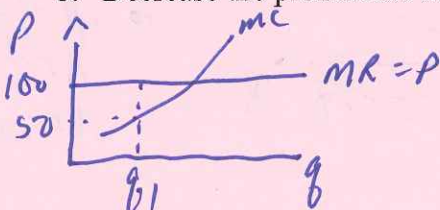
MC of last unit = $50
P = $100

Since MC < P, the firm should
   $\uparrow$ production
At q_1, last unit costs $50 to produce &
         adds $100 to Total Revenue

8. The income elasticity of demand for a product is -2. Then if income decreases by 10%, the quantity demanded for this product
   a. Increases by 20%.
   b. Decreases by 5%.

$$\varepsilon_I = \frac{\% \Delta Q^{\Delta}}{\% \Delta I}$$

$$-2 = \frac{20\%}{-10\%} \Rightarrow \% \Delta Q^D \uparrow \text{ by } 20\%$$

9. Attia can consume olives and wine and has "bowl shaped" (i.e. smooth) indifference curves over these goods. At her current consumption bundle her marginal utility of an extra olive is 2, her marginal utility of an extra cup of wine is 5, the price of an olive is $1 and the price of a cup of wine is $2.50. Atia is also spending all her income. Given this information and holding everything else constant, is Atia maximizing her utility at her current consumption bundle?
   a. Yes
   b. No

$$MU_{olive} = 2 \quad, \quad P_{olive} = \$1 \quad \Rightarrow \quad \frac{MU_{olive}}{P_{olive}} = \frac{2}{1} = 2$$

$$MU_{wine} = 5 \quad, \quad P_{wine} = \$2.50 \quad \Rightarrow \quad \frac{MU_{wine}}{P_{olive}} = \frac{5}{\$2.50} = 2$$

at optimal bundle : $\frac{MU_{olive}}{P_{olive}} = \frac{MU_{wine}}{P_{wine}}$

10. The following table contains data on various percentiles of the salary distribution of two occupations, statistician and professional athlete. Which occupation will give you the higher salary, assuming you are both an "about average" statistician and an "about average" professional athlete?

	Exactly 10% of workers earn less than	Exactly 25% of workers earn less than	The median worker earns	Exactly 75% of workers earn less than	Exactly 90% of workers earn less than
Statistician	$50,000	$75,000	$100,000	$125,000	$150,000
Professional athlete	$20,000	$35,000	$65,000	$150,000	$5,000,000

   a. Statistician
   b. Professional athlete

11. You have been given information about the cost of a typical consumption basket in the years 1990, 2000 and 2010. The cost of the basket went up between 1990 and 2000 and also went up between 2000 and 2010. Then if we use 2000 as the base year,
    a. Real prices (in year 2000 dollars) in 1990 will be lower than nominal prices in 1990.
    b. Real prices (in year 2000 dollars) in 1990 will be higher than nominal prices in 1990.

for example

Year	Cost of mrket basket	CPI	nom	real
1990	$80	$\frac{80}{100}(100) = 80$	80	100
BY 2000	$100	100	100	100
2010				

$real = \frac{nom}{CPI}$ [scale]

$real = \frac{80}{80}(100)$

12. Consider a perfectly competitive market in which all firms have identical cost curves. Firms will stop entering or exiting the market when the market price reaches the _____ of the representative firm.
    a. Shut-down price
    b. Break-even price

Entry and Exit of firms continues in LR until all firms earn zero economic profit ⇒ This occurs when
$$P = MR = MC = min \ ATC$$
min ATC is the Break-even point ⇒ tells us the break-even price

13. You are running a gummy bear factory and know that the cross price elasticity of gummy bears with respect to the price of whiskey is negative. If you see that the price of whiskey increases then you should anticipate that the demand for gummy bears will
    a. Increase.
    b. Decrease.

$Exy = \frac{\% \Delta Q^0 \ gummy \ bears}{\% \Delta P \ whiskey} < 0$

$Exy = \frac{\% \Delta Q^0 \ gummy \ bears}{↑ \ so \ ⊕ \ \%} < 0$

For Exy to be negative, there must be ↓ so ⊖ % in % ΔQ⁰ gummy bears

14. Ray enjoys consuming cheese curds with beer. However, Ray is very particular about his eating habits: he only drinks a glass of beer if he has an ounce of cheese curds to go with it, and vice versa. Then glasses of beer and ounces of cheese curds are _____ for Ray.
   a. Perfect complements
    b. Perfect substitutes

1 glass of beer must go with 1 ounce of cheese curds ⇒ perfect complements

MULTIPLE CHOICE QUESTIONS (20 QUESTIONS WORTH 3.5 POINTS EACH)

15. A market is initially in equilibrium and in this market there has been no government intervention. Then the government imposes an excise tax. Under which of the following conditions will the price consumers pay under the excise tax exactly equal the previous market price plus the excise tax amount?
    a. This described outcome occurs when supply is upward sloping. ✗
    (b.) This described outcome occurs when demand is perfectly inelastic. ✓
    c. This described outcome is always the outcome with an excise tax. ✗
    d. This described outcome can never happen. ✗
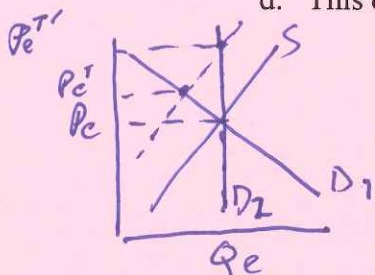
$$P_e^{T'} = P_e + \text{excise tax/unit}$$
$$\Rightarrow D_2 \text{ gives us result we are looking for}$$
$$\Rightarrow D_2 \text{ perfectly inelastic}$$

16. Suppose the demand for fried chicken is given by $Q = 1900 - 45P$. The point price elasticity at $P = 20$ is
    a. 2
    b. -0.5
    c. 0.5
    (d.) 0.9

$$Q = 1900 - 45P$$
$$45P = 1900 - Q$$
$$P = \frac{1900}{45} - \frac{1}{45}Q$$

slope of demand $= -\frac{1}{45}$

Point Price $\epsilon = \left[\frac{-1}{\text{slope}}\right]\left[\frac{P}{Q}\right]$

$= [45]\left[\frac{20}{Q}\right]$

$= [45]\left[\frac{20}{1000}\right]$

$= \frac{90}{100} = .9$

When $P = 20$, what is Q?

$Q = 1900 - 45(20)$
$Q = 1900 - 900$
$Q = 1000$

17. The consumers living in New York City have observed inflation of 10% every year. The average nominal wage in 2013 was $10 per hour. In 2014 the average wage is $10.50 per hour. Then
    a. The average New Yorker is better off in 2014 since the average New Yorker's purchasing power has increased. No
    (b.) The average New Yorker is worse off in 2014 since the average New Yorker's purchasing power has decreased. Yes
    c. The average New Yorker is neither worse off nor better off in 2014. No real wage ✓
    d. It is impossible to make a prediction about the plight of the average New Yorker's real wage given this information. ✗

	nom	CPI BY 2013	real
2013	$10	100	$10
2014	$10.50	110	$9....

real wage 2014 $= \frac{10.50}{110}[7\,10\cancel{0}]$

$= \frac{105}{11} < \$10$

$11\overline{)105}$ → 9 ... 99   no need to go further!

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

Lea can buy two goods, x and y. Her income is $800. Initially the price of x is $40 and the price of y is $10. Lea's budget line under these prices is BL1 in the diagram below and at these prices Lea consumes bundle A which lies on indifference curve IC1. The price of x then decreases to $10, which shifts Lea's budget constraint to BL2. Lea then consumes bundle B on IC2. Point C represents the bundle she would consume if her income were adjusted to force her to be on IC1 while paying the new prices for x and y.

Handwritten left margin:
$I = 800$
$P_x = \$40$ } BL1
$P_y = \$10$

$I = 800$
$P_x' = \$10$ } BL2
$P_y = \$10$

Handwritten below graph: sub. eff.   inc. eff.
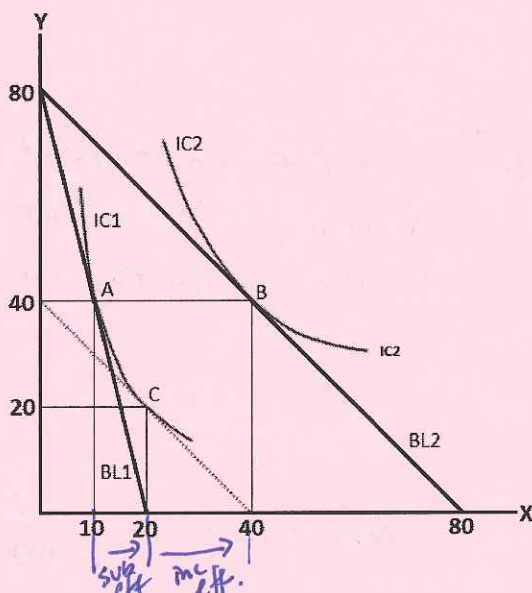
18. Which of the following summarizes Lea's preferences over A, B and C?
    a. A is better than B and B is better than C. *No A is on lower IC than B*
    b. A and C are equally good and are both better than B. *No A & C are on lower IC*
    c. A and C are equally good and are both worse than B. *Yes* ← (circled)
    d. B is better than C and C is better than A.

19. Lea consumes ___10___ more units of x due to the substitution effect of the fall in price. Lea consumes _20_ more units of x due to the income effect of the increase in real income.
    a. 30, 0
    b. 20, 10   *See graph*
    c. 10, 20 ← (circled)
    d. 0, 30

20. After the price decrease in good x, how much would Lea's income have to change to return her to her initial level of utility?
    a. Lea's income would have to fall by $400 to return her to her initial utility level. *Yes* ← (circled)
    b. Lea's income would have to increase by $400 to return her to her initial utility level. *No*
    c. Lea's income would have to fall by $200 to return her to her initial utility level. *No*
    d. Lea's income would have to increase by $200 to return her to her initial utility level. *No*

Handwritten bottom:
At C = 20 units of x
       20 units of y

$P_x'X = (\$10/unit \, of \, x)(20 \, units \, of \, X) = \$200$
$P_y Y = (\$10/unit \, of \, Y)(20 \, units \, of \, Y) = \$200$
Bundle C costs = $400
↓ Income by $400!

8

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DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!

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

Consider the tomato market in the small economy of Econland. In Econland, the market for tomatoes is described by the following equations where P is the price of tomatoes in dollars and Q is the quantity of tomatoes:
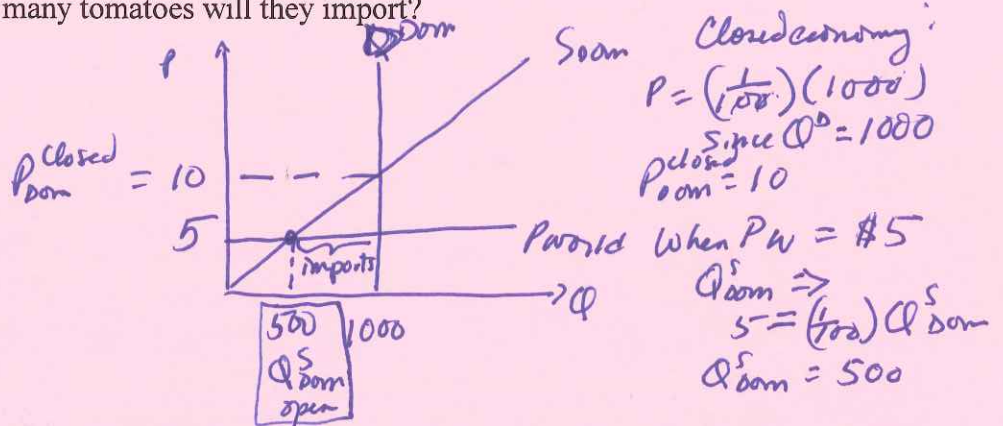
Domestic Demand: Q = 1000
Domestic Supply: P = (1/100)Q

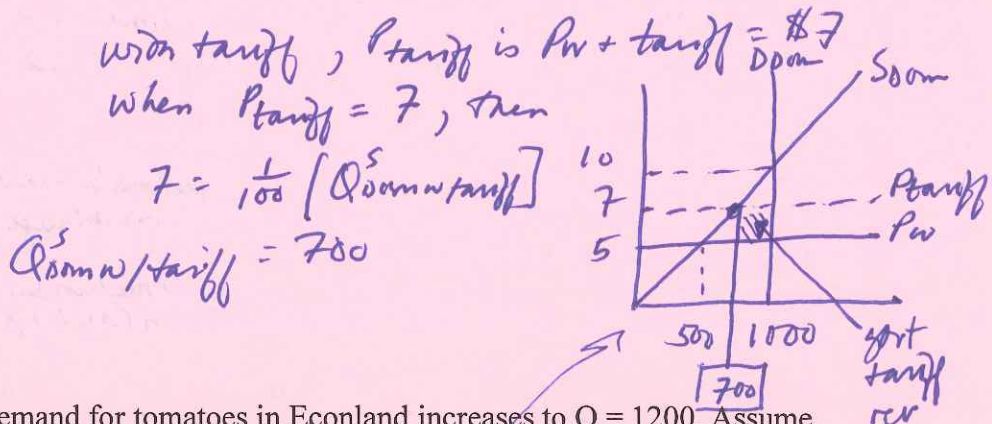Furthermore, suppose you know that the world price of tomatoes is $5.

21. Given the above information and holding everything else constant, if Econland opens to trade in the tomato market, how many tomatoes will they import?
    a. 300 tomatoes
    b. 500 tomatoes *(circled)*
    c. 700 tomatoes
    d. 1000 tomatoes

Handwritten work:
$P_{Dom}^{Closed} = 10$
Closed economy:
$P = \left(\frac{1}{100}\right)(1000)$
Since $Q^D = 1000$
$P_{Dom}^{Closed} = 10$

P_{world} when $P_W = \$5$
$Q_{Dom}^S \Rightarrow$
$5 = \left(\frac{1}{100}\right) Q_{Dom}^S$
$Q_{Dom}^S = 500$

Graph with Q_{Dom}^{open}: imports between 500 and 1000

22. If a $2 tariff is then imposed by Econland in the market for tomatoes, how many tomatoes will Econland import?
    a. 100 tomatoes
    b. 300 tomatoes *(circled)*
    c. 500 tomatoes
    d. 700 tomatoes

Handwritten work:
With tariff, P_{tariff} is P_W + tariff $= \$7$
Q_{Dom}^D
when $P_{tariff} = 7$, then
$7 = \frac{1}{100}\left[Q_{Dom}^S w/tariff\right]$
$Q_{Dom}^S w/tariff = 700$

Graph with S_{Dom}, P_{tariff}, P_W levels 10, 7, 5; values 500, 1000, 700; gov't tariff rev

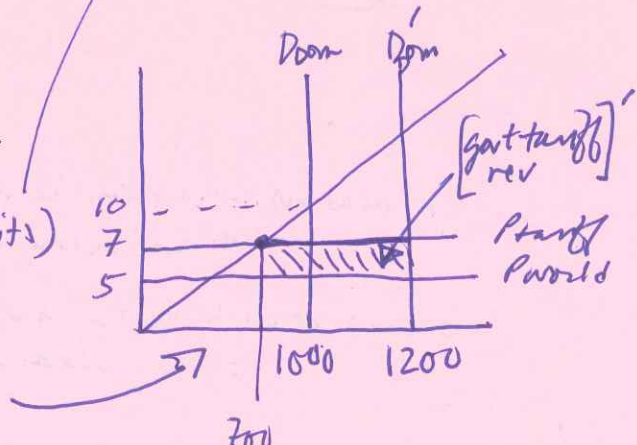23. Suppose that the domestic demand for tomatoes in Econland increases to Q = 1200. Assume that the world price does not change and that Econland still has a $2 tariff implemented on tomatoes. Given this information and holding everything else constant, Econland's government revenue from the $2 tariff
    a. Increases by exactly $200.
    b. Increases by exactly $400. *(circled)*
    c. Increases by an amount between $200 and $400.
    d. Is indeterminate.

Handwritten work:
gov't tariff rev initially = ($2/unit)(300 units)
= $600

gov't tariff rev' = ($2/unit)(500 units)
= $1000

Δ in gov't tariff rev = $1000 - $600 = $400

Graph with D_{Dom}, D_{Dom}', levels 10, 7, 5; values 1000, 1200, 700; gov't tariff rev; P_{tariff}, P_{world}

11

Use the table below to answer the following **TWO (2)** questions.

Spiculus is beginning his career as a gladiator and is trying to decide whether to work in Rome or in Carthage. Gladiators are paid different amounts in these two cities: the table below contains information about the distribution of salaries in each city (measured in denarii, the Roman currency). Furthermore, prices of goods and services are also different in the two cities, so the table below also contains a price index using Rome as the base location.

nom · *real*

	Exactly 10% of gladiators in this city earn less than	Exactly 25% of gladiators in this city earn less than	The median gladiator in this city earns	Exactly 75% of gladiators in this city earn less than	Exactly 90% of gladiators in this city earn less than	Price index with Rome as the base location	
Rome	50 denarii	100 denarii	125 denarii	175 denarii	500 denarii	100	$\frac{125}{100}(100) = 125$
Carthage	20 denarii	30 denarii	50 denarii	100 denarii	150 denarii	50	$\frac{50}{50}(100) = 100$

24. Using Rome as the base location, the real median salary of a gladiator in Rome is __125__ denarii and the real median salary of a gladiator in Carthage is __100__ denarii.
    a. 125 denarii, 25 denarii
    b. 125 denarii, 100 denarii
    c. 67.5 denarii, 50 denarii
    d. 67.5 denarii, 25 denarii

Since Rome is base location,
nom median salary in Rome = real median salary in Rome

$$\text{real median salary in Carthage} = \left[\frac{\text{nom. median salary in Carthage}}{\text{price index in Carthage}}\right](\text{scale})$$

$$\text{real median salary in Carthage} = \frac{50}{50}[100] = 100$$

25. Spiculus knows the gladiators in Rome are very good, so 75% of gladiators in Rome will earn more than Spiculus will if he works there. The gladiators in Carthage are not so good: Spiculus will be able to beat many of them and so will earn a salary higher than 75% of the gladiators in Carthage. Assuming Spiculus only cares about his real salary, Spiculus
    a. Should work in Carthage. *real salary in Carthage > real salary in Rome*
    b. Should work in Rome.
    c. Will be indifferent between working in Rome and working in Carthage.
    d. Has insufficient information to answer this question.

Spiculus works in Rome his nominal salary is 100 denarii
$$\rightarrow \text{real salary in Rome} = \left[\frac{\text{nom}}{\text{price index}}\right](\text{scale}) = \left[\frac{100}{100}\right](100) = 100$$

Spiculus works in Carthage his nominal salary is 100 denarii
$$\rightarrow \text{real salary in Carthage} = \left[\frac{\text{nom}}{\text{price index}}\right](\text{scale}) = \left[\frac{100}{50}\right]100 = 200$$

12

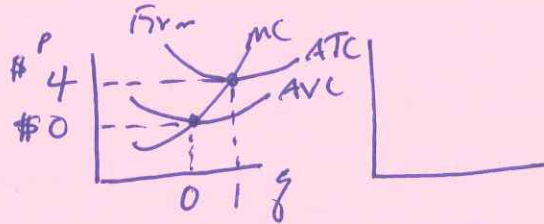*Remember since Rome is base location $\rightarrow$ nominal salary = real salary in Rome*

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

Assume that the market for ice cream on the Terrace at UW-Madison is perfectly competitive. Each ice cream cart on the Terrace has the same total cost function curve and marginal cost curves. These cost curves are given by the following equations where q is the number of servings of ice cream:

Total Cost Curve for Representative Ice Cream Cart: $TC = q^4 + 3$
Marginal Cost Curve for Representative Ice Cream Cart: $MC = 4q^3$

26. The break-even price of a serving of ice cream is _____ and the shut-down price of a serving of ice cream is _____.
    a. $1, $0
    b. $1, $3
    c. $4, $3
    d. $4, $0 ← (circled)

Handwritten work:

Break-even price: when $MC = ATC$
$$4q^3 = \left[\frac{q^4 + 3}{q}\right]$$
$$4q^4 = q^4 + 3$$
$$3q^4 = 3$$
$$q^4 = 1 \Rightarrow q = 1$$

$\Rightarrow MC = 4q^3$ so
$MC = P = 4$
when $q = 1$

Shut down price: When $MC = AVC$
$TC = FC + VC$
When $q = 0$, $TC = FC \Rightarrow$ so $VC = q^4$
$MC = AVC$
$4q^3 = \frac{q^4}{q}$
$4q^4 = q^4 \Rightarrow q = 0$
$MC = P = 0$

27. Suppose now that the market demand for ice cream is given by the following equation where Q is the market quantity of ice cream servings and P is the price per serving:
    Market Demand Curve: $Q = 100 - 2P$ $\Rightarrow$ $2P = 100 - Q$
    $P = 50 - \frac{1}{2}Q$
    How many servings of ice cream are supplied when this market is in long run equilibrium? Assume that all of the above information is still true and that everything has been held constant.
    a. 100 servings of ice cream
    b. 94 servings of ice cream
    c. 92 servings of ice cream ← (circled)
    d. 98 servings of ice cream

Handwritten work:
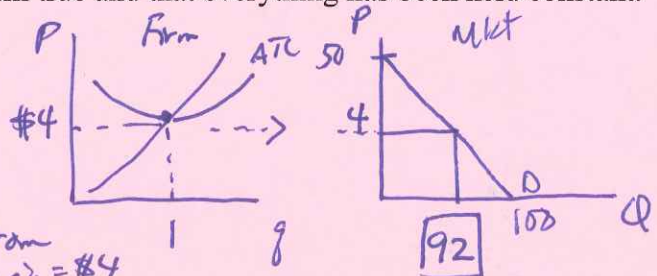
LR eq. price is breakeven price $\Rightarrow$ from previous question we know breakeven price = $4
So, if $P = 4, what is Q in mkt? $\Rightarrow$ $P = 50 - \frac{1}{2}Q$
$4 = 50 - \frac{1}{2}Q$
$\frac{1}{2}Q = 46$ $\Rightarrow$ $Q = 46(2) = 92$ units

28. How many ice cream carts will be present when this market is in long run equilibrium?
    a. 25 ice cream carts
    b. 23 ice cream carts
    c. 92 ice cream carts ← (circled)
    d. 94 ice cream carts

Handwritten work:

since $q = 1$ for one cart and
$Q_{mkt} = 92$ servings
$\#$ firms $= \frac{Q_{mkt}}{q_{firm}} = \frac{92}{1} = 92$ firms

13

The Next **Two (2)** questions are related to one another.

29. Donald Zurcher is operating a bus company. One day he raises the price of a bus ticket by a small amount and finds that his revenue increases. Then Zurcher
    a. Was initially charging a price on the inelastic part of the demand curve. ✔
    b. Was initially charging a price on the elastic part of the demand curve. ✗
    c. Will definitely make more revenue if he increases the price even more. *Not necessarily - may enter elastic region*
   d. Will definitely make less revenue if he increases the price even more. *Not necessarily - may still be in inelastic region*
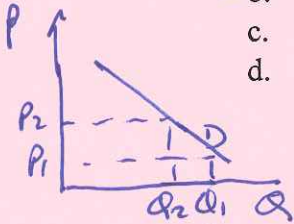
*↑P from P_1 to P_2, TR↑ ⟹ D is inelastic b/w P_1 & P_2*

30. Suppose the demand curve for Zurcher's buses is linear. If Zurcher is charging a price that maximizes revenue, the point price elasticity of demand is
    a. Strictly greater than one.
    b. Equal to one.
    c. Strictly smaller than one.
    d. Indeterminate.

midpt max, TR ⟹ at midpoint $E_D = 1$
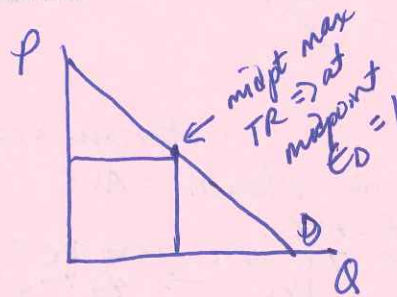
31. Which of the following statements about cost functions is **incorrect**?
    a. Total cost consists of total fixed cost and total variable cost. ✔ *TC = FC + VC yes*
    b. The marginal cost curve (MC) intersects the average variable cost curve (AVC) at the lowest point of the average variable cost curve (AVC). ✔ *yes - see diagram*
    c. The marginal cost curve (MC) intersects the average total cost curve (ATC) at the lowest point of the average total cost curve (ATC). ✔ *yes - see diagram*
    d. The average fixed cost curve is always upward sloping.

FC is constant for firm in SR.
AFC = $\frac{FC}{q}$ as q ↑, $\frac{\overline{FC}}{q}$ must ↓

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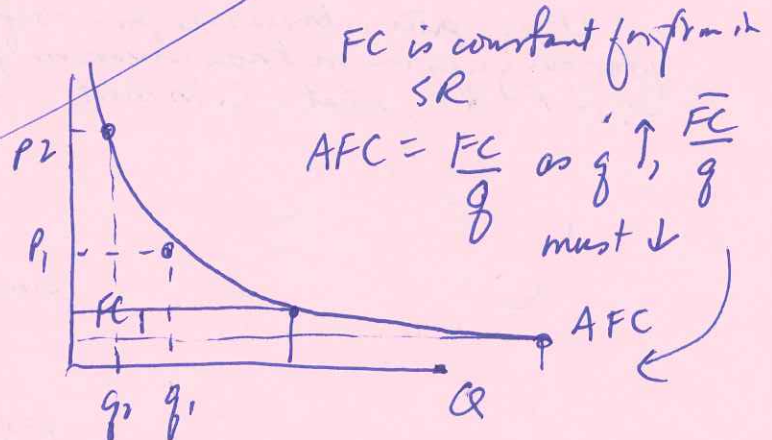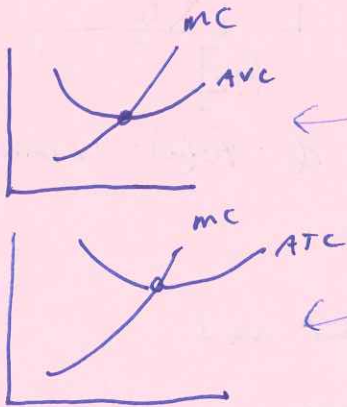
32. Consider the following table that contains data on the nominal and real price of a loaf of bread in ancient Byzantium over time, where the price is in denarii and the base value of the price index is 100.

	Nominal price of loaf of bread	Real price of loaf of bread, measured in year 50 AD denarii	Price index
25 AD	6 denarii	10 denarii	60
50 AD	20 denarii	20 denarii	100
75 AD	40 denarii	30 denarii	133.3333

Inflation between 25 AD and 50 AD was ~67% and inflation between 50 AD and 75 AD was 33%.

a. 60%, 33.33%
b. 66.67%, 33.33% ✓ (circled)
c. 60%, 25%
d. 66.67%, 25%

(Handwritten work:)

in 25 AD:

real price $= \left[\dfrac{\text{nom price}}{\text{price index}}\right](\text{scale})$

$10 = \left[\dfrac{6}{\text{price index}}\right]100$

price index $= \dfrac{(6)(100)}{10} = 60$

inflation b/w 25 AD & 50 AD:

inflation rate $= 100\% \cdot \dfrac{\text{Price Index in 50AD} - \text{Price Index in 25AD}}{\text{Price Index in 25 AD}}$

infl. rate $= (100\%)\left[\dfrac{100-60}{60}\right] = \left[\dfrac{40}{60}\right](100\%)$

infl rate $= 67\%$

inflation rate b/w 50 AD & 75 AD:

infl. rate $= \left[\dfrac{133.33-100}{100}\right](100\%) = 33.33\%$

33. Suppose demand and supply for widgets are given by the following equations where P is the price of a widget in dollars and Q is the quantity of widgets:

Demand: $P^d = 110 - (1/2)Q$
Supply: $P^s = (1/2)Q + 10$

Suppose the government imposes an excise tax of $20 per widget. Given this information and holding everything else constant, what is the resulting deadweight loss due to the imposition of this excise tax?

a. There is no deadweight loss.
b. $1600
c. $400
d. $200 (circled)

(Handwritten work:)
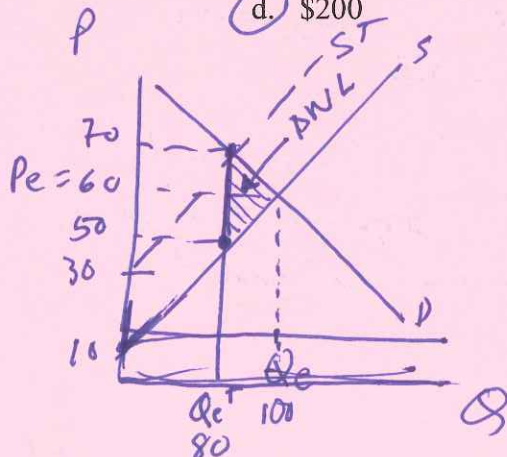
No tax: $110 - \frac{1}{2}Q = \frac{1}{2}Q + 10$

$100 = Q_e$

$P_e = 110 - \frac{1}{2}(100) = 60$

or $P_e = \frac{1}{2}(100) + 10 = 60$

w/tax: $S^T \Rightarrow P = \frac{1}{2}Q + 30$

$110 - \frac{1}{2}Q_e^T = \frac{1}{2}(Q_e^T) + 30$

$80 = Q_e^T$

$P_e^T = 110 - \frac{1}{2}(Q_e^T) = 110 - \frac{1}{2}(80) = 70$

DWL $= \frac{1}{2}(\$70/\text{unit} - \$50/\text{unit})(100\text{ units} - 80\text{ units})$
$= \frac{1}{2}(\$20/\text{unit})(20\text{ units}) = \$200$

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34. The government is considering imposing an excise tax of $2 per unit on a good. If the suppliers collect the tax for the government, which of the following statements about the economic incidence of this excise tax is true?

    a. Consumers do not bear any of the economic burden of the excise tax.
    b. Suppliers bear most of the economic burden of the excise tax.
    c. The economic burden of the excise tax is split equally between consumers and suppliers.
    d. We need more information to know who bears the economic burden of the excise tax.

End of exam. Check you have filled in your scantron correctly!
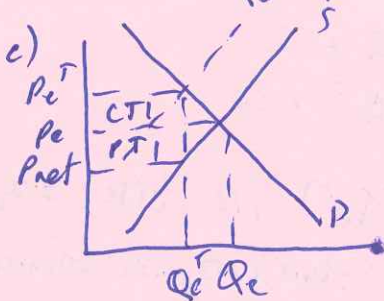
→ Answers (a), (b) and (c) are not absolutely true given the info:

a) $P_e^T = P_e$

P_{net}

Q_e^T Q_e
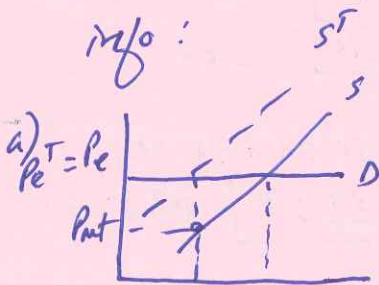
No CTI if D is perfectly elastic ⟹ **BUT** we are not told this, so we cannot assume this

b) P_e^T, P_e, P_{net}, CTI, PTI

Q_e^T Q_e
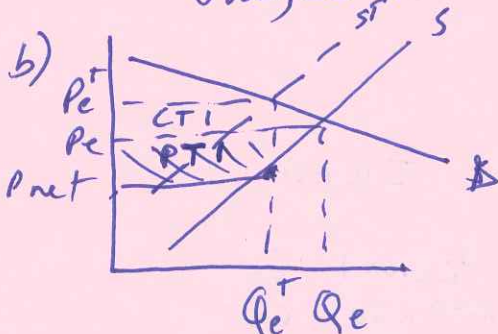
$PTI > CTI$ if $|\epsilon_D| > |\epsilon_S|$
(see question 1 of this exam)
So (b) is true provided $|\epsilon_D| > |\epsilon_S|$ ⟹
BUT we are not told this, so we cannot assume this

c) P_e^T, P_e, P_{net}, CTI, PTI

Q_e^T Q_e

$CTI = PTI$ if $|slope\ of\ D| = |slope\ of\ S|$
So (c) is true provided $|slope\ of\ D| = |slope\ of\ S|$ ⟹
BUT we are not told this, so cannot assume this

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