Economics 101 Spring 2019 April 16, 2019 Midterm Exam 2	Name _ANNOTATED KEY_ TA Name _____ Discussion Section # _____ 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 **33 multiple choice questions worth 3 points each for a total of 99 points**. The last point is administrative and earned by accurately and completely providing your **name, ID number, discussion section number, version number, and TA name** on the scantron sheet and the exam booklet. Answer all questions on the scantron sheet with a #2 pencil. There are 20 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 and first name in the spaces marked "Last Name," and "First Name". 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.
   > **Example:** If you are registered for section 361 and it says "VERSION 2" at the top of this page, your "Special Codes" should read 3612.
- **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.**

Zaure Aitkulova (April)	Daniel Chaves	Wenbo Min
361 F 9:55 – 10:45 am Van Hise 391	**363** F 12:05 – 12:55 pm Sterling 1339	**362** Tr 4:35 – 5:25 pm Soc Sci 5322
366 F 11:00 – 11:50 am Van Hise 483	**364** F 1:20 – 2:10 pm Soc Sci 6322	**368** F 8:50 – 9:55 am Van Hise 205
	360 F 2:25 – 3:15 pm Ingraham 115	**367** F 9:55 – 10:45 am Van Hise 574
		365 F 11:00 – 11:50 am Van Hise 487

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**DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET! EXAM
CONTINUES ON NEXT PAGE**

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 _____

EASY

1. (Just two choices here!) Consider a small, closed economy. If this economy opens its gadget market to trade and the domestic price of gadgets is less than the world price of gadgets then:

a. The total surplus in this market will increase if the market is opened to trade. ✓
b. The value of producer surplus in this small economy will decrease when this market is opened to trade. X
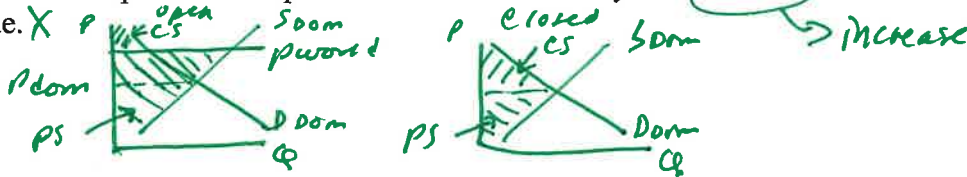
A LITTLE WORK

2. (Just two choices here!) Peter operates a factory and this year Peter decided to triple his employment of labor, his employment of raw materials, and his employment of capital. This decision to increase the amount of labor, raw materials and capital that he uses did not affect the price of any of these inputs. Peter only uses labor, raw materials and capital to produce his product. At the end of the year Peter realized that he had managed to produce two and a half times as much output as he had prior to this increase hiring of labor, raw materials, and capital. From this information we can conclude that:

a. Peter's factory experienced decreasing costs per unit and decreasing returns to scale. False
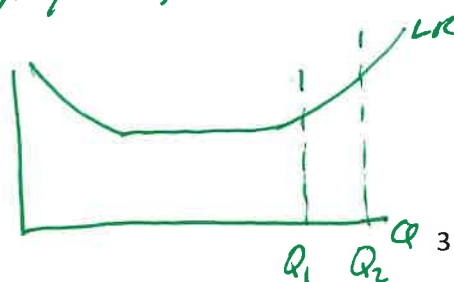b. Peter's factory experienced increasing costs per unit and decreasing returns to scale.
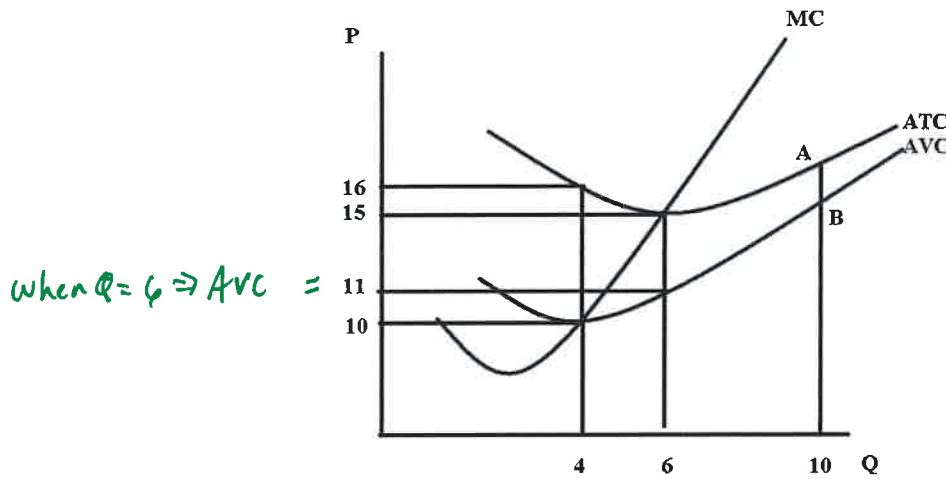
Initially
$$ATC = \frac{TC}{Q}$$

Then
$$TC' = 3TC$$ Since he triples his employment of labor, raw materials, capital

$$ATC' = \frac{3TC}{2.5Q} \implies ATC' > ATC$$

3

Use the graph below of a firm's cost curves to answer the next THREE (3) questions.

when Q = 6 ⇒ AVC = 11

if Q = 6
P = 15
TR = P·Q = 15(6) = $90
TC = ATC·Q = 15(6) = $90
π = 0

SOME WORK

3. Suppose this firm produces 6 units of output and sells these units for $15 per unit. How many of the following statements are true given this information?

- At this price and output combination this firm earns zero economic profit. *T*
- This firm's average variable costs are equal to $11 per unit. *T*
- This firm's average total costs are equal to $90. *F*   *ATC = $15/unit; TC = $90*
- This firm's fixed costs are greater than its variable costs. *F*

wrong answer marked ⟶

a. One statement is true.
ⓑ Two statements are true.   *ANSWER IS (B)!! NOT C!!*
c. Three statements are true.
d. Four statements are true.

TC = 90
TC = VC + FC
TC = AVC·Q + FC
90 = 11(6) + FC
24 = FC

FC vs VC
‖   ‖
$24 $66
FC < VC

NOT HARD

4. (Only two choices here!) If this firm produces four units of output then:
ⓐ Its total costs are equal to $64. *T*   *TC = ATC·Q = 16(4) = $64*
b. Its average fixed cost is greater than its average variable costs if it produces 6 units of output.
   AFC = ATC − AVC ⇒ AFC = 16 − 10 = 6 ; AVC = 10   *AVC > AFC at Q = 4*

NOT HARD IF YOU KNOW THE CONTENT

5. Consider the distance from point B to point A in the above graph. What is this distance equal to?

a. The length of this distance cannot be determined from the provided information.
ⓑ This distance must be greater than $2 per unit and less than $3 per unit.
c. This distance must be greater than $3 per unit and less than $4 per unit.
d. This distance must be greater than $1 per unit and less than $2 per unit.

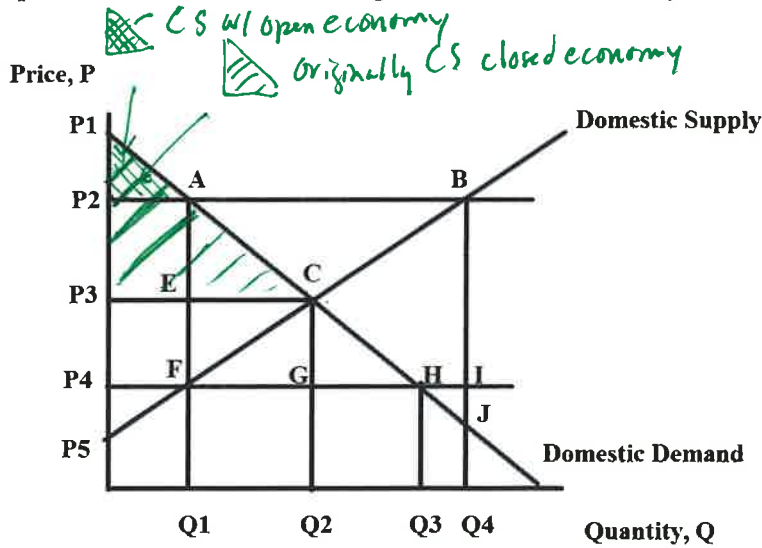*FC is constant in SR no matter the Q*
So Q = 4 ⇒ FC = (16 − 10)(4) = $24
Q = 6 ⇒ FC = (15 − 11)(6) = $24
When Q = 10 ⇒ FC = 24   ∴ AFC = 2.40 since
AFC·Q = FC
(2.40)(10) = FC ✓

4

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

The graph below represents the market for widgets in a small economy.

[Handwritten annotations on graph: "CS w/ open economy", "Originally CS closed economy"]

Price, P

P1

P2 — A ———————— B — Domestic Supply

P3 — E ——— C

P4 — F ——— G ——— H I
                           J

P5 — Domestic Demand

Q1   Q2   Q3 Q4   Quantity, Q

[Handwritten left margin: SOME THOUGHT: GRAPH READING SKILLS]

6. If this market is currently closed to trade and the world price of widgets is equal to P2, then we know that if this market opens to trade, then:

[Handwritten: "export"]
a. This economy will import (Q4 – Q1) units of the good. *F*
b. Producer surplus will be equal to area P2ACP5. *F P2 B P5*
c. The difference between the new area of consumer surplus with trade and the initial area of consumer surplus without trade will be area P2ACP3. *T*
d. The area of deadweight loss due to opening this market to trade will be area ABC. *F NO DWL w/ open economy*
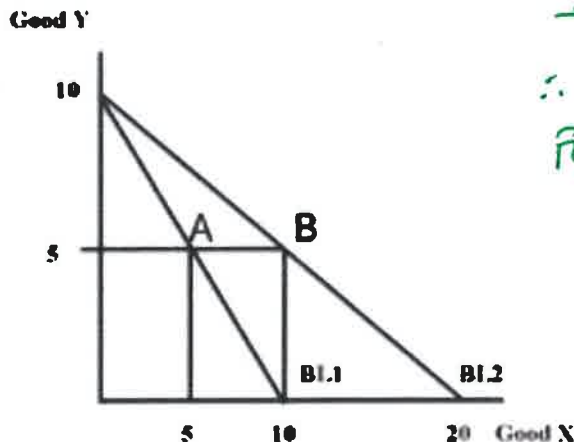
[Handwritten left margin: STRAIGHT FROM LECTURE]

7. If this market is currently closed to trade and the world price of widgets is equal to P4, then we know that if this market opens to trade, then:

a. Consumer surplus will be equal to the area P1HP4. *T*
b. Producer surplus will be equal to the area P2BP5. *F P4 F P5   P1 H F P5*
c. Total surplus will be equal to the area P1CP5. *F*
d. The deadweight loss from this market being closed to trade is equal to area CGF. *F C H F*

6

SOME WORK: STRAIGHT FROM LECTURE – BUT TO DO THIS EASILY REQUIRES PRACTICE

Figure is blurry

8. You are provided the following graph depicting George's budget line one, BL1, and George's budget line two, BL2. When George faces BL1 he maximizes his utility by consuming the consumption bundle designated as point A. When George faces BL2 he maximizes his utility by consuming the consumption bundle designated as point B. You are also told that the price of Y is \$2 per unit.

$$\frac{I}{2} = \frac{I}{P_y} =$$

Good Y graph with BL.1 and BL.2, points A and B. Axes: Good Y (10, 5), Good X (5, 10, 20).

$$\frac{I}{2} = 10, \therefore I = \$20$$
$$\therefore P_x = \$1 \text{ for } BL_1$$
$$\text{For } BL_2: \quad \text{Income} = \$20$$
$$P_x' = \$2$$
$$P_y = \$1$$

Given the above information and holding everything else constant, what is the equation for George's demand curve for good X that is consistent with the above graph? Assume that the George's demand curve for good X for quantities between 5 and 10 can be approximated with a linear demand equation.

a. $P = 3 - (1/5)Q$
b. $P = 3 - (1/10)Q$
c. $P = 10 - (1/5)Q$
d. $P = 20 - (1/10)Q$

Price of X
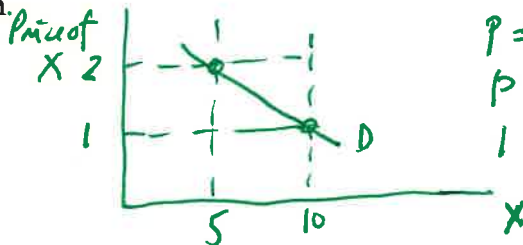
$$P = mQ + b$$
$$P = -\frac{1}{5}Q + b$$
$$1 = \left(-\frac{1}{5}\right)(10) + b$$
$$3 = b$$
$$\boxed{P = 3 - \left(\frac{1}{5}\right)Q}$$

A BIT MORE CHALLENGING – LECTURE INCLUDED THIS KIND OF EXAMPLE

9. Consider the market for roses. You know that the price elasticity of demand is given as 1.5 in this market. If your company which grows roses decides to put the roses on sale for 30% this week and you are currently selling 200 roses per week, how many roses will you sell during this sale week?

a. 110 roses
b. 260 roses
c. 290 roses
d. 450 roses

$$E_D = 1.5$$
$$E_D = \left| \frac{\% \Delta Q^D}{\% \Delta P} \right|$$
$$E_D = \left| \frac{\% \Delta Q^D}{-30} \right|$$
$$1.5 = \frac{\% \Delta Q^D}{30}$$
$$45.0 = \% \Delta Q^D$$

$$\% \Delta Q = \left[\frac{Q_2 - Q_1}{Q_1} \right] 100\%$$
$$45 = \left(\frac{Q_2 - 200}{200} \right)(100)$$
$$90 = Q_2 - 200$$
$$\boxed{290 = Q_2}$$

7

10. Cafe Starbags is a new coffee shop on State Street. After extensive market research, the owners of Café Starbags find that the income elasticity of frappuccinos is 0.5 and the cross-price elasticity of bagels and espresso is -0.8. Given this information and holding everything else constant, how many of the statements below are true?

- The income elasticity for frappucinos is less than one, so the demand for frappucinos is inelastic. *F If $E^D < 1$ this is true $E^I < 1$ does not tell us this* ✗
- Frappucinos are a normal good and bagels and espressos are inferior goods. *F* ✗
- Frappucinos are a normal good and bagels and espressos are substitutes. *F* ✗
- Since the cross-price elasticity of bagels and espresso is negative, Café Starbags should not sell these items. ✗

a. None of the statements are true.
b. One of the statements is true.
c. Two of the statements are true.
d. Three of the statements are true.

$E_I = .5 > 0 \Rightarrow$ Frappuccinos normal

$E_{xy} = -0.8 \Rightarrow$ Bagels & espresso complements

11. Which of the following statements is true about a normal indifference curves?

a. As you move downward along an indifference curve the absolute value of the slope of the indifference curve increases. *F*

b. Each point on the individual's indifference curve represents a point that is equally affordable for that individual. *F ⇒ each pt has same utility*

c. The total satisfaction of consuming two goods sometimes increases and sometimes decreases as we move down an indifference curve *F ⇒ each pt has same utility*

d. For a given indifference curve for an individual, the individual will get the same utility no matter what consumption bundle they choose to consume on that indifference curve. *T*
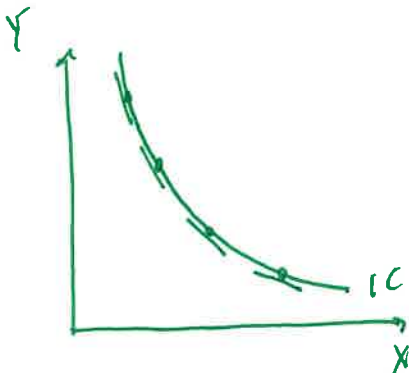
|slope| gets smaller ⇒ (a) not true

8

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

Consider the market for kiwis in the small open economy of Aussieland. This market is characterized by the following, where Q is quantity of kiwis, and P is the price of a unit of kiwis in dollars:

Domestic Demand: $P = 1,000 - (1/2)Q$
Domestic Supply: $P = 2Q$
World Price $= \$100$

[handwritten:] $\Rightarrow \boxed{\frac{1}{2}Q^D = 1000 - P \Rightarrow Q^D = 2000 - 2P}$
$\Rightarrow \boxed{Q^S = \frac{1}{2}P}$

[handwritten left margin:] EASY

12. What is the quantity of kiwis that will be imported or exported into Aussieland when the market for kiwis is completely open to trade in Aussieland?

a. 350 kiwis will be imported.
b. 1750 kiwis will be exported.
c. 1400 kiwis will be imported.
d. 700 kiwis will be imported.

[handwritten left margin:] LOT OF WORK: BUT NOT HARD

13. Suppose now that Aussieland's dictator has a vested interest in the domestic kiwi market and decides to impose an import quota of 250 kiwis. What is the deadweight loss associated with this policy?

a. $400,000
b. $180,000
c. $720,000
d. $450,000

[handwritten work, right side:]

$\rightarrow DWL = \frac{1}{2}(700-100)(350-50) +$
$\qquad\qquad \frac{1}{2}(700-100)(1800-600)$

$DWL = \frac{1}{2}(600)(300) + \frac{1}{2}(600)(1200)$
$DWL = 90,000 + 360,000$
$\boxed{DWL = \#450,000}$

[handwritten work, left bottom:]

12. If $Pw = \$100$

$P = 1000 - \frac{1}{2}Q^D$
$\frac{1}{2}Q^D = 900$
$Q^D = 1800$
$P = 2Q^S$
$100 = 2Q^S$
$Q^S = 50$

$Q^D - Q^S = Imports = 1800 - 50 = 1750$

13. 1000

$\boxed{Pquota = 700}$

$100 = Pw$

[handwritten graph with axis labels: 50, 350, 600, 1800, 2000 Q, DWL]

[handwritten work, bottom right:]
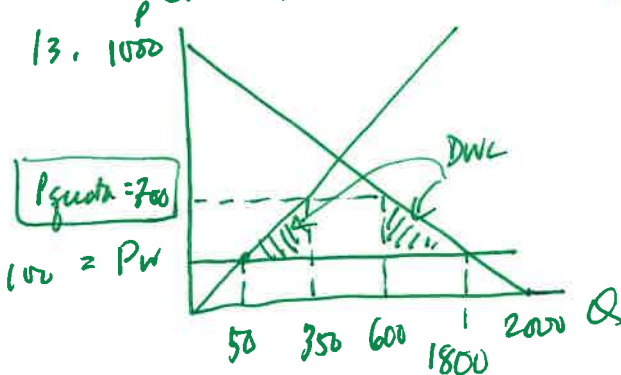
$Q^S_{Dom} + Import\ Quota = Q^D_{Dom}$

$(\frac{1}{2}P) + 250 = 2000 - 2P$

$\frac{5}{2}P = 1750$
$P = 1750(\frac{2}{5}) = 700$

if $P = 700$
$\Rightarrow Q^S = 350$
$\Rightarrow Q^D = 600$

9

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

Yuchi has $30 available to spend on hamburgers (H) and chips (C). The price of a hamburger is $6 and the price of a package of chips is $3.

Yuchi's Utility Function: $U = 3*(H)*(C)$
Marginal Utility of Hamburgers $= 3*(C)$
Marginal Utility of Chips $= 3*(H)$

HANDER:
SOME
WORK!

14. Given this information and holding everything else constant, what it the maximum utility that Yuchi can have from hamburgers and chips?

a. Utility $= 13.5$ utils
b. Utility $= 24$ utils
c. Utility $= 36$ utils
d. Utility $= 37.5$ utils

PROOF
REQUIRES
WORK

15. Suppose Yuchi's income increases to $45. Given this information and holding everything else constant, are hamburgers and chips normal or inferior goods for Yuchi?

a. hamburger is an inferior good and chips are a normal good
b. hamburger is a normal good and chips are an inferior good
c. both goods are normal goods
d. both goods are inferior goods

EASY

16. (Just two choices here!) Which of the following statements is true?

a. Trade is beneficial since trade increases total surplus. T
b. Open trade is always beneficial to domestic consumers. F (not if $P_{world} > P_{Dom}$)

14. BL: $\boxed{I = P_x X + P_y Y \\ 30 = 6H + 3C}$

slope of $BL =$ slope of IC

$$\frac{P_H}{P_C} = \frac{MU_H}{MU_C}$$

$$\frac{2\cancel{6}}{\cancel{3}_1} = \frac{3C}{3H}$$

$\boxed{2H = C}$

14. BL_1 : $I = P_H H + P_c C$

$$\boxed{30 = 6H + 3C}$$

$\left| \text{slope of } BL \right| = \left| \dfrac{P_H}{P_c} \right| = \left| \dfrac{6}{3} \right| = \left| -2 \right| = 2$

slope of $IC = \dfrac{MU_H}{MU_c} = \dfrac{3C}{3H} = \dfrac{C}{H}$

Consumer maximizes utility when

$\left| \text{slope of } BL \right| = \left| \text{slope of } IC \right|$

$$\dfrac{2}{1} = \dfrac{C}{H}$$

$$\boxed{2H = C}$$

So $\quad 30 = 3(2H) + 3C$

$30 = 3(C) + 3C$

$30 = 6C$

$$\boxed{5 = C}$$

∴ $\quad 2H = C$

$2H = 5$

$$\boxed{H = 2.5}$$

$U = 3HC$

$U = 3(2.5)(5)$

$U = 37.5$

15. $I' = 45$

BL_2 : $45 = 6H + 3C$

$\left| \text{slope of } BL \right| = 2$

slope of $IC = \dfrac{MU_H}{MU_c} = \dfrac{C}{H}$

$$\boxed{2H = C}$$

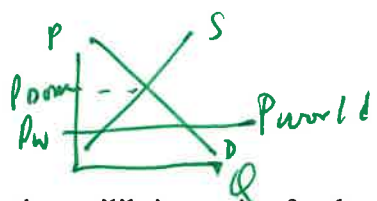$45 = 3(2H) + 3C$

$45 = 3(C) + 3C$

$45 = 6C$

$7.5 = C \quad$ as $I\uparrow, C\uparrow$ from 5 to 7.5

$C \Rightarrow$ normal good

$H = \dfrac{7.5}{2} = 3.75 \quad$ as $I\uparrow, H\uparrow$ from

2.5 to 3.75

$H \Rightarrow$ normal good

11

17. *(handwritten left margin: STRAIGHT FROM LECTURE)* Consider a specific market in a small economy where the domestic equilibrium price for the good is greater than the world price for that good. Suppose the small economy is debating three policies with regard to this specific market:

(1) opening this market to trade while simultaneously implementing either an import quota or tariff on this good,
(2) keeping this market completely closed from trade, and
(3) completely opening this market to trade with no implemented quotas or tariffs.

Which of the following statements is true? (Note: (1) > (2) > (3) means policy (1) is the most preferred, policy (2) is the second-most preferred, and policy (3) is the least-preferred.)

a. Consumers prefer (1) > (2) > (3). Producers prefer (3) > (2) > (1).
b. Consumers prefer (3) > (1) > (2). Producers prefer (2) > (1) > (3). ✓
c. Consumers prefer (1) > (3) > (2). Producers prefer (2) > (3) > (1).
d. Consumers prefer (2) > (3) > (1). Producers prefer (1) > (3) > (2).

(handwritten right side:)
Consumers ranking
#3
#1 } only (b) satisfies
#2 } this ⇒ if confident stop here!
Producers ranking
#2
#1
#3

18. *(handwritten left margin: EASY)* In the market for calendars the demand curve is given by the following equation where P is the price in dollars and Q is the quantity of calendars:

Market Demand Curve: $P = 2100 - (1/28)Q$

Suppose the goal of the firm providing calendars to this market is to maximize their revenue. Then given this information and holding everything else constant, this firm should produce:

a. (1050)(28) calendars.
b. 1050 calendars.
c. 28 calendars.
d. (75)(1050) calendars.

(handwritten:) 2100; 1050 = P; midpt maximizes revenue
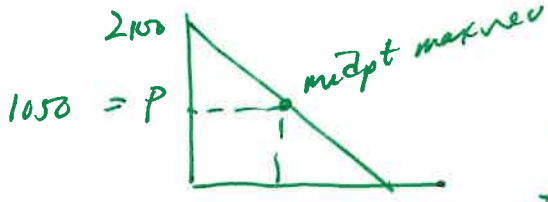
$\frac{2100}{2} = 1050 = P$

if P = 1050 ⇒
$1050 = 2100 - \frac{1}{28} Q$
$\frac{1}{28} Q = 1050$
$Q = (1050)(28)$

19. *(handwritten left margin: STRAIGHT FROM LECTURE)* Suzy reports that she prefers football to baseball and baseball to soccer. Then she tells us that she prefers soccer to football. Given this information and holding everything else constant, Suzy's preferences are:

(handwritten: F to B & B to S)

a. logically consistent.
b. inconsistent.
c. easily represented by normal indifference curves.
d. best captured by the way we draw her budget line.

(handwritten:) This is about ruling out IC crossing one another: Property that IC cannot intersect one another

CHALLENGING

20. The income elasticity of steak is positive. The cross-price elasticity between steak and hamburgers is positive. The cross-price elasticity between steak and potatoes is negative. Given this information and holding everything else constant, which of the following scenarios will definitely increase the demand for steak?

causes a movement along demand $\varepsilon^I_{steak} > 0 \Rightarrow$ steak normal good

a. An increase in the price of steak

$\varepsilon_{steak \& hamburgers} > 0 \Rightarrow$ steak & hamburgers are substitutes

b. A decrease in the price of hamburgers

c. **A decrease in the price of potatoes**

d. A decrease in consumer incomes

$\varepsilon_{steak \& potatoes} < 0 \Rightarrow$ steak & potatoes are complements

SEE BELOW

21. The demand curve for brushes is described by the following equation where P is the price per brush in cents and Q is the quantity of brushes:

Market Demand Curve: $Q = 25 - (1/5)P$

The current price of a brush is 90 cents. If the price decreases to 75 cents what is the price elasticity of demand? Use the arc elasticity or midpoint method to calculate this elasticity.

a. 17/33
b. 2/3
c. 33/17
d. 3/2

$P_1 = 90 \Rightarrow Q_1 = 25 - (\frac{1}{5})(90)$
$Q_1 = 25 - 18 = 7$

$P_2 = 75 \Rightarrow Q_2 = 25 - (\frac{1}{5})(75)$
$Q_2 = 25 - 15 = 10$

$$\varepsilon^D = \left| \frac{\frac{Q_2 - Q_1}{Q_2 + Q_1}}{\frac{P_2 - P_1}{P_2 + P_1}} \right| = \left| \frac{\frac{10-7}{17}}{\frac{75-90}{165}} \right| = \frac{\frac{3}{17}}{\frac{15}{165}}$$

$$\frac{3}{17} \left(\frac{165}{15} \right) = \frac{33}{17}$$

22. In the market for laundry detergent suppose that the price elasticity of demand is equal to 0.4. If prices decrease by 15% in this market this implies that the percentage change in the quantity demanded will be:

a. an increase of 37.5%.
b. a decrease of 37.5%.
c. **an increase of 6%.**
d. a decrease of 6%.

$$\varepsilon^D = 0.4 = \left| \frac{\% \Delta Q^D}{\% \Delta P} \right|$$

$$0.4 = \left| \frac{\% \Delta Q^D}{-15\%} \right|$$

$$\% \Delta Q^D = (15\%)(0.4) = 6.0\%$$

20. (a) this causes a movement along demand curve
(b) this causes a decrease in demand: demand for steaks shifts left
(c) this causes a rightward shift in the demand for steaks
(d) this cause a leftward shift in the demand for steaks

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

Marianna's utility from consuming pies (P) and tea (T) is described by the following information:

Utility = 4PT
Marginal utility of pies = MUp = 4T
Marginal utility of tea = MUt = 4P

Marianna's income is initially equal to $200 and the price of a pie is $5 per pie and the price of tea is $4 per unit.

Some work

23. Given the above information and holding everything else constant, what is the consumption bundle (P, T) that maximizes Marianna's utility?

a. (P, T) = (10, 37.5)
b. (P, T) = (20, 25)
c. (P, T) = (12, 25)
d. (P, T) = (16, 30)

Some work

24. Suppose that the price of a pie increases to $8 per pie. Given this information and holding everything else constant, what is Marianna's new utility if she maximizes her utility?

a. Utility = 1250
b. Utility = 125
c. Utility = 100
d. Utility = 312.5

HARD: Lots of steps to get HERE!

25. The price of a pie is still $8 per pie. Which of the following expressions accurately describes Marianna's substitution effect?

a. Martina's substitution effect is equal to $[12.5 - (5)(10^{1/2})]$.
b. Martina's substitution effect is equal to $[20 - (5)(10^{1/2})]$.
c. Martina's substitution effect is equal to $[(5)(10^{1/2}) - 12.5]$.
d. Martina's substitution effect is equal to $[20 - 12.5]$.

23. Slope of $IC = \dfrac{MU_P}{MU_T} = \dfrac{4T}{4P} = \dfrac{T}{P}$

Slope of $BL_1 = \dfrac{P_P}{P_T} = \dfrac{5}{4}$
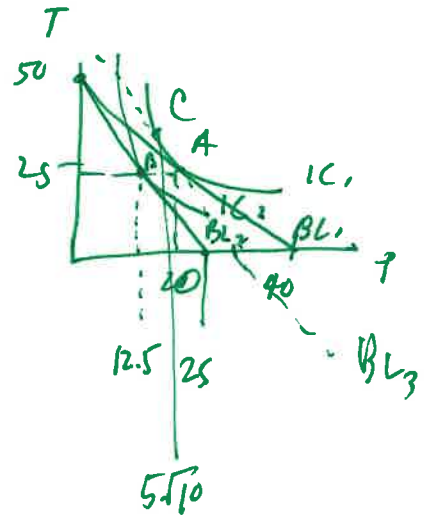
$BL_1:$ $Inc = P_P P + P_T T$

$\boxed{200 = 5P + 4T}$

$\dfrac{T}{P} = \dfrac{5}{4}$

$\boxed{4T = 5P}$

$200 = 5T + 4T$
$200 = 8T$
$25 = T$

∴ $4(T) = 5P \Rightarrow 100 = 5P \Rightarrow P = 20$

$(P,T) = (20, 25)$ maximizes her utility initially at pt. A

24. $P_x' = P_P' = 8$

slope of $BL_2 = \dfrac{P_P'}{P_T} = \dfrac{8}{4} = 2$

slope of $BL_2 =$ slope of IC

$2 = \dfrac{T}{P}$

$\boxed{2P = T}$

$BL_2:$ $\boxed{200 = 8P + 4T}$

$200 = 4(2P) + 4T$
$200 = 4(T) + 4T$
$200 = 8T$
$25 = T$

∴ $2P = 25$
$P = 12.5$

$(P',T') = (12.5, 25)$ maximizes her utility at pt. B

U at pt B: $U = 4(12.5)(25)$
$U = 100(12.5) = 1250$

25. Substitution Effect $\Rightarrow$ Need pt. C

pt C $\Rightarrow \boxed{2P_3 = T_2}$

and $U_C = U_A = .$
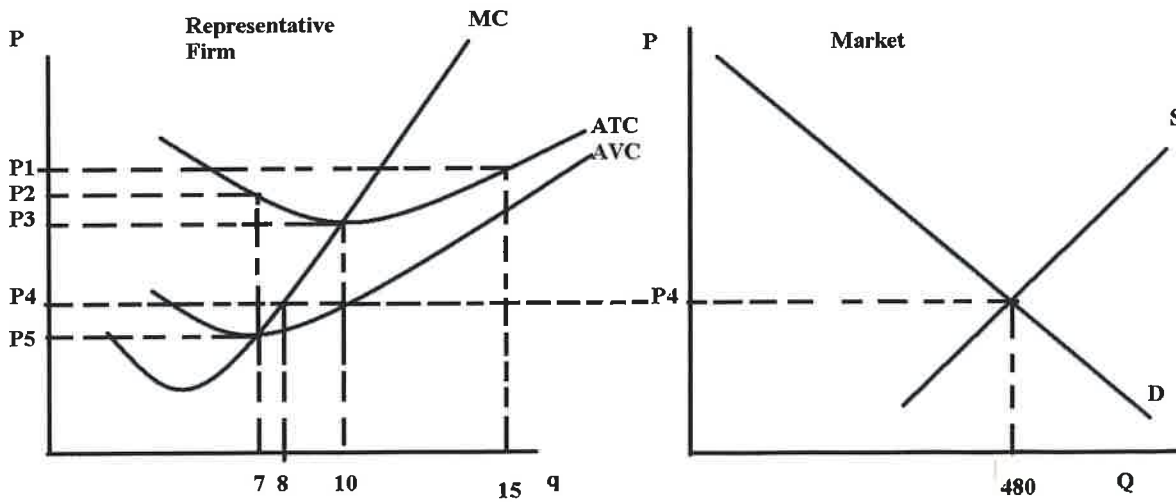
$U_C = 4 P_3 T_3$
$2000 = 4 P_3 T_3$
$500 = P_3 T_3$

$U_A = 4(20)(25)$
$U_A = 2000$

$\to 500 = P_3 (2P_3)$
$500 = 2 P_3^2$
$250 = P_3^2$
$25 \cdot 10 = P_3^2$
$P_3 = 5\sqrt{10}$

Substitution effect $\Rightarrow$ A to C

Sub eff $= 20 - 5\sqrt{10}$

15

Use the graphs below of a perfectly competitive market and a representative firm in that market to answer the next THREE (3) questions.

EASY (handwritten)

26. Given the above graph and holding everything else constant, the representative firm in this industry in the short run will:

a. produce 8 units of output and earn negative economic profit. T (handwritten)
b. shut down since its total revenue will not cover its fixed costs of production. F (handwritten)
c. break even since all perfectly competitive firms break even. F   this true only in LR (handwritten)
d. find that if it increases its production level, its fixed costs of production will fall. F (handwritten)
    ⌐ are constant in SR (handwritten)

NOT HARD (handwritten)

27. Suppose in the long run there are 90 firms in this market. Given this information and the above graphs, what is the total output produced in this market in the long run?

a. 630 units
b. 720 units
c. 900 units
d. 1350 units

LR π maximizing output for rep. firm is 10 units (handwritten)
⟹ where MC = ATC (handwritten)
Q = (# of firms)(q produced by a firm) (handwritten)
Q = 90(10) = 900 (handwritten)

EASY (handwritten)

28. In the short run, for this representative firm:

a. If q = 10, then fixed cost is equal to (P3 – P4)*(10). ✓ (handwritten)
b. If q = 10, then variable cost is equal to (P3 – P4)*(10). ✗ VC = P4 Q (handwritten)
c. If q = 10, then profit is equal to (P3 – P4)*(10) ✗ ⟹ if q = 10 ⟹ π = 0 (handwritten)
d. If q = 10 then fixed cost is greater for this firm then if q = 15. ✗ (handwritten)
    ⟹ FC is constant in the SR for the firm (handwritten)

$FC = AFC \cdot q$ (handwritten)
at q = 10 ⟹ APC = ATC − AVC (handwritten)
    AFC = P3 − P4 (handwritten)

so (handwritten)
$FC = (P3 − P4)(10)$ when q = 0 (handwritten)

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29. (Only two choices here!) Consider an individual that buys good X and good Y. Assume good X is measured on the horizontal axis. Holding everything else equal if the price of good Y increases then:

a. the absolute value of the slope of the new budget line is smaller than the absolute value of the slope of the original budget line.

b. the absolute value of the slope of the new budget line is larger than the absolute value of the slope of the original budget line.

30. The table below shows Zitong's marginal utilities from slices of cheesecake and pieces of apple pie. Suppose the price of a slice of cheesecake is $4, the price of a piece of apple pie is $3 and his income is $24. Given this information and holding everything else constant, what is Zitong's optimal consumption bundle?

Slices of Cheesecake	MU cheesecake	Pieces of Apple Pie	MU apple pie
1	24	0	21
2	18	1	18
3	12	2	15
4	8	3	12
5	4	4	9
6	1	5	6

a. 4 slices of cheesecake and 3 pieces of apple pie X

b. 3 slices of cheesecake and 4 pieces of apple pie ✓

c. 6 slices of cheesecake and 0 pieces of apple pie X

d. 0 slices of cheesecake and 8 pieces of apple pie X

29.
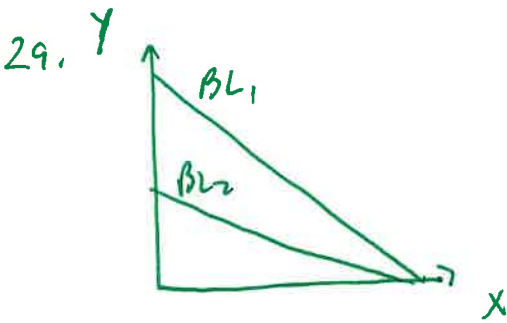
As $P_Y \uparrow$ |slope of BL| gets smaller

30. $\dfrac{MU_{cheesecake}}{P_{cheesecake}} = \dfrac{MU_{applepie}}{P_{applepie}} \Rightarrow \dfrac{MU_C}{4} = \dfrac{MU_A}{3}$

$I = P_C C + P_A A$

$24 = 4C + 3A$

(a) $\dfrac{8}{4}$ vs $\dfrac{12}{3} \neq$ X

(b) $\dfrac{12}{4}$ vs $\dfrac{9}{3} = $ ✓ Can he afford this?

$3C \times P_C = \$12$

$4A \times P_A = \$12$

$\$24$ yes

(c) $\dfrac{6}{4}$ vs $\dfrac{0}{3} \neq$ X

(d) $\dfrac{0}{4}$ vs ? not in table – can't be answer! X

18

Use the following information about a perfectly competitive market and a representative firm in that market to answer the following THREE (3) questions. Assume that all firms are identical in this market.

Market Demand Curve: P = 100 − Q
Market Supply Curve: P = 20 + Q

Total Cost for the Representative Firm: TC = 16 + 4q + 4q²
Marginal Cost for the Representative Firm: MC = 4 + 8q

IF You KNOW CONTENT, THIS IS EASY

31. Given this information and holding everything else constant, in the short run how many of output, q, will the representative firm produce?

a. q = 40 units
b. q = 7 units
c. q = 8 units
d. q = 9 units

NOT HARD

32. Given this information and holding everything else constant, in the short run what is the value of the representative firm's profits?
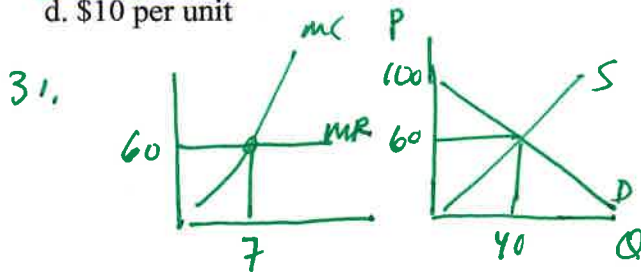
a. Profit = $180
b. Profit = $240
c. Profit = $420
d. Profit = $190

NOT TOO BAD

33. Given this information and holding everything else constant, what is the long run equilibrium price in this market?

a. $60 per unit
b. $40 per unit
c. $20 per unit
d. $10 per unit

$$\frac{196}{44} \quad 240$$

31. [hand-drawn graphs of MC, MR, and supply/demand curves]

$$100 - Q = 20 + Q$$
$$80 = 2Q$$
$$40 = Q$$
$$P = 20 + 40 = 60$$

$MR = MC$
$60 = 4 + 8q$
$56 = 8q$
$7 = q$

32. $TR = P \cdot q = 60(7) = 420$
$TC = 16 + 4(7) + 4(7)^2$
$TC = 16 + 28 + 4(49)$
$TC = 44 + 196 = 240$

$\pi = 420 - 240$
$\pi = 180$

33. LR equilibrium when
$MC = ATC$ for firm
$4 + 8q = \frac{16}{q} + 4 + 4q$
$4q = \frac{16}{q}$
$q^2 = 4$
$q = 2$
at $q = 2 \Rightarrow P = MC \Rightarrow$
$P = 4 + 8(2) = \$20$