Economics 101	Name *ANNOTATED KEY*
Fall 2016	TA Name _____
October 18, 2016	Discussion Section Number _____
First 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!

BINARY CHOICE QUESTIONS (9 QUESTIONS WORTH 2 POINTS EACH)

EASY

1. The lines $y = 5 + 2x$ and $3y + x = 30$ do <u>**not**</u> intersect.
   a. True
   b. False

   $y = 5 + 2x$ has ⊕ slope of 2
   $3y = 30 - X$
   $y = 10 - \frac{1}{3}x$ has ⊖ slope
   lines must intersect

EASY

2. Which of the following statements is a positive statement?
   a. Sam and Hans should produce the number of apples and oranges at the kink point of their joint PPF graph. *→ normative*
   b. Sam has an absolute advantage in the production of apples, while Hans has an absolute advantage in the production of oranges. *✓*

EASY

3. Kate is a junior in high school and is deciding whether or not she should attend college. The full-time salary that Kate forgoes to attend college is considered an accounting cost. *→ it's an opportunity cost*
   a. True
   b. False

4. Tom owns a bakery. He uses two secret ingredients "A" and / or "B" to prepare his world-famous cookies. In a particular year, you observe that his demand curve for "A" shifts right. Which of the following statements might be consistent with this shift?

D for A shift to right if $P_B \uparrow$ and B & A are substitutes

a. "A" and "B" are complements, and the price of "B" has gone up.

b. "A" and "B" are substitutes, and the price of "B" has gone up. ✓

5. Consider that fast food is an inferior good for Beth. She will reduce her consumption of fast food if she receives a 15% wage increase.

a. True

b. False

$\uparrow$ in income $\Rightarrow Q^D \downarrow$ if inferior good

6. Apartment rent in Madison is currently $1,000 per month. The government is planning to establish a price ceiling of $1,200 per month for apartment rent. This policy will most likely create a shortage of apartments in Madison.

a. True

b. False

Price ceiling to be effective must be less than equilibrium price

7. Brazil and Colombia both produce soy beans and coffee beans. Suppose we observe Brazil imports coffee beans from Colombia, and they export their soy beans to Colombia. Which of the following statements may be **false** given this information? Assume that the coffee beans and soy beans grown by the two countries are identical. → *Looking for the false*

   a. Colombia has the absolute advantage in the production of coffee beans. *This may not be true.*

   b. Colombia has the comparative advantage in the production of coffee beans. *True*

8. In the financial crisis, the value of the houses owned by American citizens collapsed. How would you represent this event in the T-account of American citizens?

   a. As a decrease in the value of assets and a decrease in net worth.

   b. As a decrease in the value of liabilities and an increase in net worth.

   House is something of value you own: if value of house ↓, this ↓ value of assets & for a given amount of liabilities will ↓ net worth

9. Suppose that you have a market with a downward sloping demand curve and an upward sloping supply curve. The implementation of an excise tax in this market will always reduce the value of both the consumer surplus and the producer surplus.

   a. True

   b. False
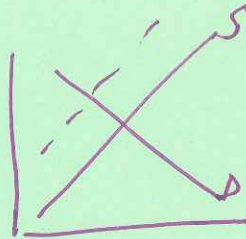
MULTIPLE CHOICE QUESTIONS (20 QUESTIONS WORTH 4 POINTS EACH)

WEARYING –
BUT NOT
THAT
HARD

10. (Warning: this problem will either be easy for you or VERY HARD-do not spend too much time on this question!) As of 2016, the European Union comprised 28 member states. The GDP (gross domestic product) per capita of the European Union is equal to $40,000, and the average population of these 28 countries is 20 million inhabitants. Eight additional countries (Albania, Bosnia-Hercegovina, Croatia, Iceland, Macedonia, Montenegro, Serbia, and Turkey) have applied to join the European Union in the last decade. Suppose that the current GDP per capita of these eight countries is equal to $20,000. Finally, consider that the average population of the eight countries that are looking forward to joining the European Union is equal to 10 million inhabitants.

Approximately, what would be the new GDP per capita of the European Union, if the current member states decide to accept the applications to join the European Union of these eight countries?

a. $ 30,000
b. $ 33,300
c. $ 34,400
d. $ 37,500

average income
if 36 countries

$$= \frac{40,000(20m)(28) + (20,000)(10m)(8)}{(20m)(28) + (10m)(8)}$$

$$= \frac{(10m)(4)}{(10m)(4)} \left[\frac{(40,000)(2)(7) + (20,000)(2)}{(2)(7) + 2} \right]$$

$$= \frac{40,000(14) + 40,000}{14 + 2} = \frac{40,000(15)}{16}$$

$$= \frac{10,000(15)}{4}$$

$$= \frac{5000(15)}{2}$$

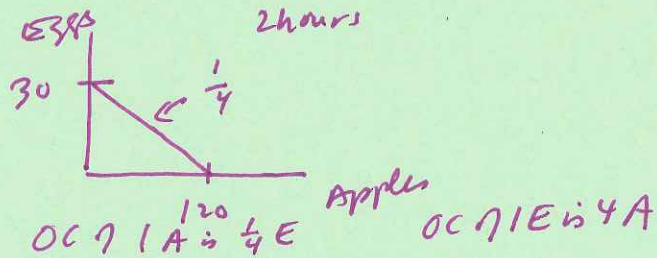$$= \frac{75000}{2} = 37,500 \; !!$$

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

Susan is working on the family farm. She has two main responsibilities: picking apples and collecting eggs. Susan can collect 30 eggs in 2 hours, and can pick 60 apples in 1 hour.

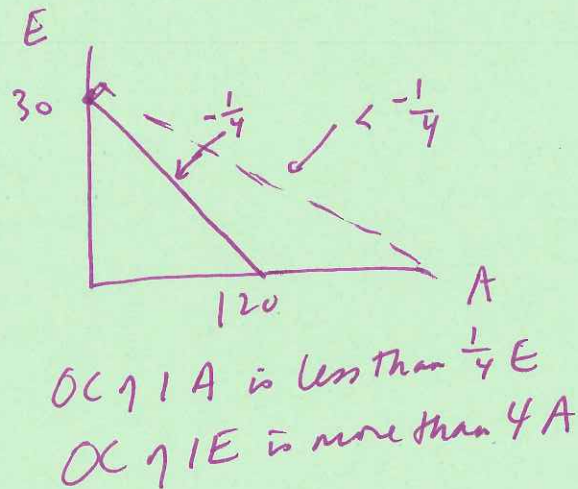*NOT HARD* 11. What is Susan's opportunity cost of collecting 1 egg (in terms of picking apples)?

    a. 1/2 apples

    b. 2 apples

    (c.) 4 apples

    d. 6 apples

Handwritten annotations: Eggs, 2 hours, 30, $-\frac{1}{4}$, 120, Apples, $OC \uparrow 1 A \approx \frac{1}{4} E$, $OC \uparrow 1 E$ is $4A$
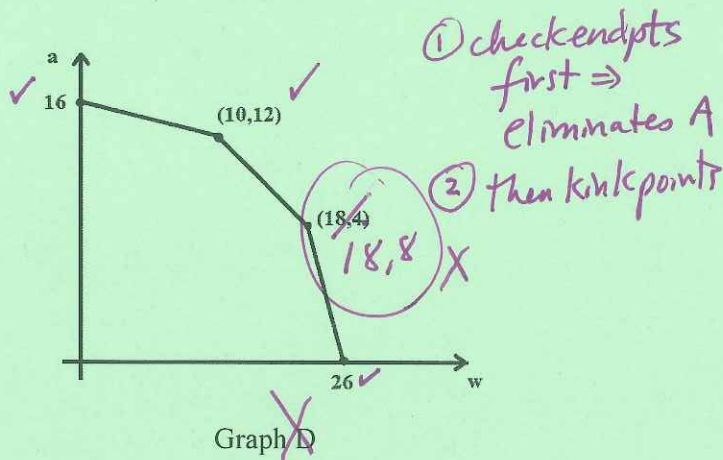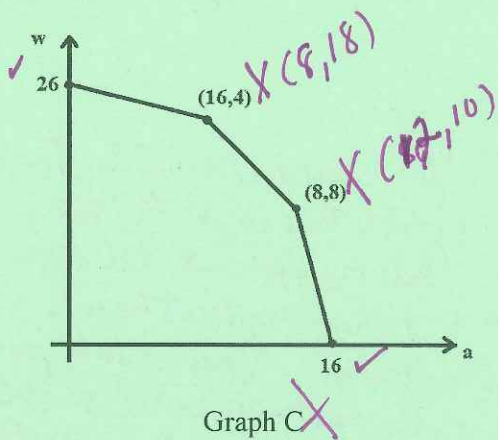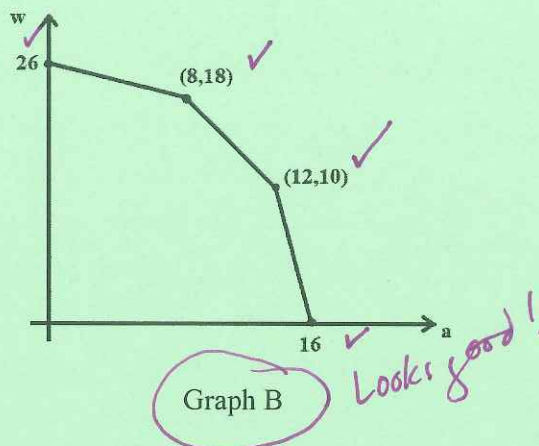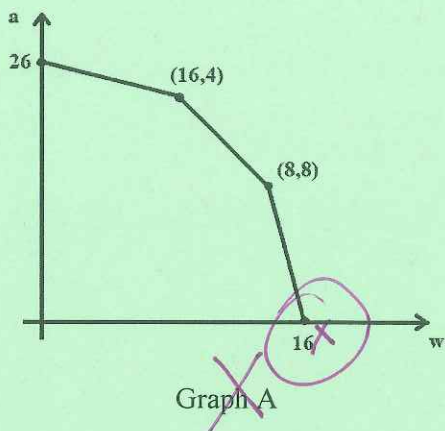
NOT HARD 12. Suppose a new technology is introduced on the farm that allows Susan to pick apples at a faster rate. Holding everything else constant, how does this affect Susan's opportunity cost of collecting 1 egg (in terms of picking apples)?

    (a.) Her opportunity cost of collecting 1 egg increases. ✓

    b. Her opportunity cost of collecting 1 egg decreases. ✗

    c. There is no effect on her opportunity cost of collecting 1 egg. ✗

    d. Her opportunity cost of collecting 1 egg may have increased, decreased, or remained the same. ✗

Handwritten annotations: E, 30, $-\frac{1}{4}$, $-\frac{1}{4}$, 120, A, $OC \uparrow 1 A$ is less than $\frac{1}{4} E$, $OC \uparrow 1E$ is more than $4A$
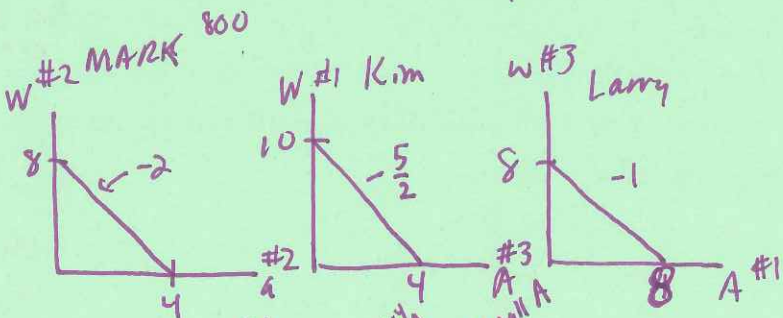
SOME
WORK –
NOT THAT
HARD
BUT
THERE IS
WORK

13. Mark, Kim, and Larry are students at the computer engineering department at UW Madison. Besides studying, each of them can work 800 hours per year. Each of them can use their time to design either websites (w) or Android apps (a). Assume that each of these individuals has a linear production possibility frontier in the production of these two goods. Mark can design a website in 100 hours and an Android app in 200 hours, Kim can design a website in 80 hours and an Android app in 200 hours, and Larry can design a website in 100 hours and an Android app in 100 hours. Assume that they decide to create a company together. Which graph (these graphs are **NOT** drawn to scale) represents most accurately the joint PPF of their company?
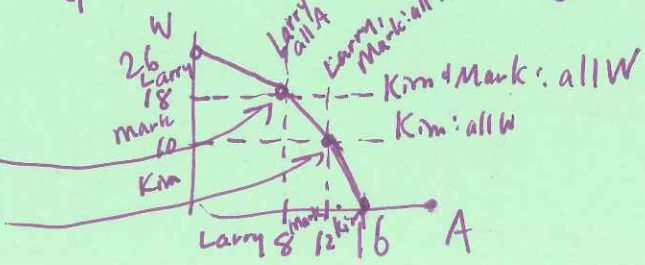
Graph A — axes: a (vertical), w (horizontal); points 26, (16,4), (8,8), 16 ✗ (circled)

Graph B — axes: w (vertical), a (horizontal); 26, (8,18) ✓, (12,10) ✓, 16 ✓ — (circled) Looks good!

Graph C — axes: w (vertical), a (horizontal); ✓ 26, (16,4) ✗ (8,18), (8,8) ✗ (17,10), 16 ✓ — Graph C ✗

Graph D — axes: a (vertical), w (horizontal); ✓ 16, (10,12) ✓, (18,4) circled 18,8 ✗, 26 ✓ — Graph D ✗

① check endpts first ⇒ eliminates A
② then kinkpoints

a. Graph A
b. Graph B (circled)
c. Graph C
d. Graph D

#2 MARK 800
W, slope −2, 8 ... 4 ... #2 a

#1 Kim
W, 10, slope −$\frac{5}{2}$, 4 ... #2 ... A

#3 Larry
W, 8, slope −1, 8 A #1

if axis switched!
then
$(W, A) = (8,8)$ ⟸ $(A, W) = (12, 10)$
and
$(W, A) = (10,12)$ ⟸ $(A, W) = (12, 10)$

$A, W = (8, 18)$

W, 26 Larry, 18, Mark 10, Kim ...
Larry all A, Larry & Mark: all A, Mark: all A
Kim & Mark: all W
Kim: all W
Larry 8 12 16 A

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

Every Japanese or American worker can produce 5 cars per year. Each American worker can produce 2 tons of rice and each Japanese worker can produce 3 tons of rice per year. Assume that each country has 10 million workers.

PREDICTABLE, EASY

14. Which of the following statements is true, given the above information and holding everything else constant?

   a. Neither country has a comparative advantage in the production of cars. Japan has a comparative advantage in the production of rice. ✓

   b. Japan has the comparative advantage in the production of both rice and cars. ✗ *Not possible*

   c. Japan has the comparative advantage in the production of cars, and the US has the comparative advantage in the production of rice. ✗

   (d.) Japan has the comparative advantage in the production of rice, and the US has the comparative advantage in the production of cars. ✓

MODERATE DIFFICULTY

15. What is the equation for their joint PPF? Consider that c represents millions of cars and r represents millions of tons of rice.

   (a.) $c = \begin{cases} 100 - 5/3\ r, & \text{if } r \le 30 \quad ✓ \\ 125 - 5/2\ r, & \text{if } r > 30 \quad ✓ \end{cases}$

   b. $c = 100 - 2r$ ✗

   c. $c = \begin{cases} 125 - 5/2\ r, & \text{if } r \le 20 \quad ✗ \\ 100 - 5/3\ r, & \text{if } r > 20 \end{cases}$

   d. $c = \begin{cases} 100 - 5/2\ r, & \text{if } r \le 20 \quad ✗ \\ 250/3 - 5/3\ r, & \text{if } r > 20 \end{cases}$

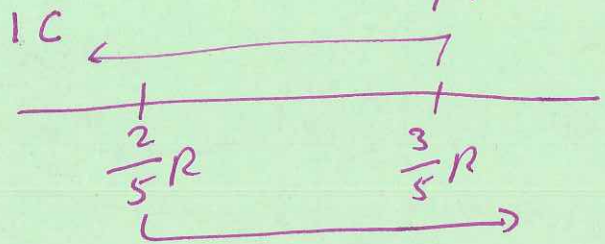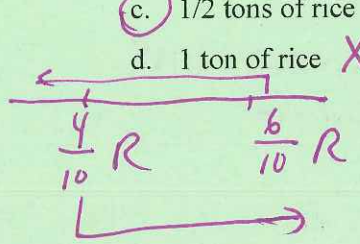*You could eliminate these 3 with this logic ⇒ the 2 countries have different OC of production & that implies there's a kink point. This kink point occurs when R = 30. So (b) has no kink point since there's only one equation and*
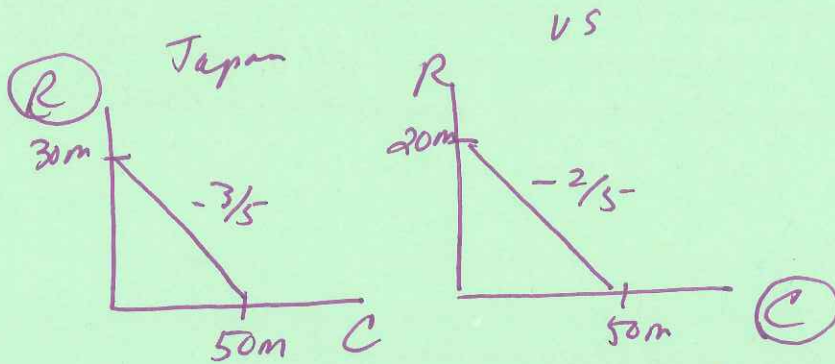
NOT HARD

16. Which of the following is an acceptable price to both countries for one car in terms of tons of rice assuming that both countries are specializing in the production of the good for which they have a comparative advantage?

   a. 1/8 tons of rice ✗

   b. 1/4 tons of rice ✗

   (c.) 1/2 tons of rice ✓

   d. 1 ton of rice ✗

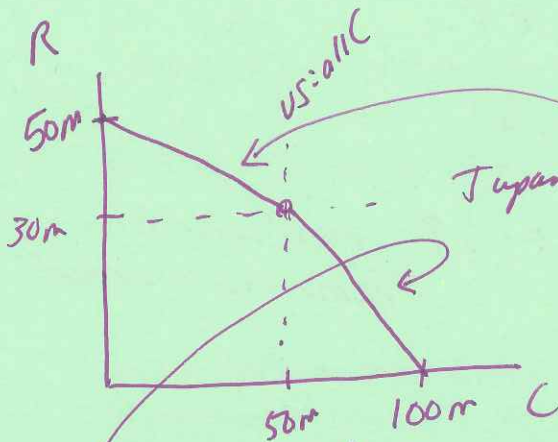*(c) and (d) have the wrong value for r!! No need to actually find the equations!!*

$1C$

$\frac{4}{10}R \qquad \frac{6}{10}R$

$\frac{2}{5}R \qquad \frac{3}{5}R$

Japan

US

Ⓡ

30m

$-3/5$

50m C

R

20m

$-2/5-$

50m Ⓒ

US has comp adv in C;
Japan has comp adv in R

OC of $1C$ is $3/5 R$

OC of $1R$ is $5/3 C$

OC of $1C$ is $2/5 R$

OC of $1R$ is $5/2 C$

R

50m

30m

US: all C

Japan: all R

50m   100m   C

$y = mx + b$

$R = b - \frac{3}{5}C$

$0 = b - \frac{3}{5}(100)$

$60 = b$
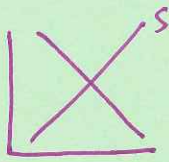
$R = 60 - \frac{3}{5}C$

$\frac{3}{5}C = 60 - R$

$C = \frac{5}{3}[60 - R]$

$\boxed{C = 100 - \frac{5}{3}R \text{ for } R \leq 30}$

$R = 50 - \frac{2}{5}C$

or

$\frac{2}{5}C = 50 - R$

$C = \frac{5}{2}[50 - R]$

$\boxed{C = 125 - (\frac{5}{2}R) \text{ if } R \geq 30m}$

Can eliminate
answers (b) and (d) and
also (c)!

CAN STOP HERE!

But here's the
other equation!

[handwritten top-left, diagram of supply/demand curves labeled S]

17. Which of the following events will most likely **NOT** cause a shift to the left in the supply curve of tomatoes in Florida? Holding everything else constant,

   a. The publication of a scientific study that links tomato consumption and stomach cancer. *D shifts left*
   b. A financial crisis in Florida that forces the majority of tomato harvesters to go bankrupt. *↓ firms: S shifts L*
   c. An increase in the price of fertilizers required to harvest tomatoes. *↑cost ↑prod. S shifts left*
   d. A hurricane that destroys a big percentage of tomato fields. *bad weather: S shifts left*

[handwritten left margin] SOME LOGIC NEEDED HERE

18. Suppose that the price of leather shoes has not changed in the last month, but the quantity sold has increased dramatically. Which of the following combination of events is consistent with this information? *P̄, Q↑ is what we are looking for*

   a. The cost of leather has increased, and the price of wool socks (a complement of leather shoes) has also increased. *X* *leather shoes Q↓, P?*
   b. The cost of leather has increased, and the price of tennis shoes (a substitute of leather shoes) has increased. *Q?, P↑*
   c. The cost of leather has decreased, and the price of tennis shoes (a substitute of leather shoes) has also decreased. *P↓, Q?*
   d. The cost of leather has decreased, and the price of wool socks (a complement of leather shoes) has also decreased. *P?, Q↑ price could have remained constant!*

[handwritten left margin] NOT HARD

19. Suppose that you are a policymaker that wants to increase the consumption of milk in your economy. Which of the following policies could help you achieve your goal without having to intervene directly in the milk market? (Assume milk and cereal are complements, while milk and soy milk are substitutes.) Holding everything else constant, enact a policy that

   a. Reduces the price of cereal. *✓ ↓P cereal ⇒ Q cereal ↑ ⇒ Need more milk*
   b. Increases the supply of soy milk at every price. *X ↑P soy milk, Demand for milk shifts Left*
   c. Reduces the price of soy milk. *X P soy milk ↓, Demand for milk shifts left*
   d. Increases the price of cereal. *X Q cereal ↓ ⇒ less milk needed*

   Goal: ↑ consumption of milk

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

Consider the market of airplane tickets from Madison to Chicago, in which only two companies offer tickets: American Airlines and United Airlines. An analyst is analyzing the whole market using the available data. The analyst knows that the following equations describe the individual supply curves for the two firms where P is the price per ticket and Q is the number of tickets.

American Airlines supply curve: $P = 100 + 1/4\,Q$
United Airlines supply curve: $P = 300 + Q$

MEDIUM DIFFICULTY

20. Given this information and holding everything else constant, the market supply curve (include the supply from both airlines) is given by:

a. $P = 400 + 5/4\,Q$ ✗ *need 2 equations*

b. $P = \begin{cases} 100 + 1/4\,Q, & \text{if } 0 \le Q \le 800, \\ 140 + 1/5\,Q, & \text{if } 800 \le Q \end{cases}$ ✓✓✓✓

c. $P = \begin{cases} 100 + 1/4\,Q, & \text{if } 0 \le Q \le 800, \\ 300 + Q, & \text{if } 800 \le Q \end{cases}$ ✗ *} This one you could easily eliminate*

d. $P = 140 + 1/5\,Q$ ✗ *need 2 equations*

No math approach: (a), (d) are wrong since there is a kink point & ∴ 2 equations
(c) is wrong because you aren't adding the 2 firms' supply curves together horizontally

COULD BE VERY CHALLENGING!

21. Hint: This is a challenging question and you need to be careful in your analysis! The analyst also has the following demand schedule representing the demand for airplane tickets for men and women.

Price of ticket	Q demanded by men	Q demanded by women
$ 0	400	200
$ 300	250	50
$ 600	100	0

Assuming that the demand curves for men and women are linear, what are the coordinates of the kink point of the market demand curve?

a. $(Q = 300, P = \$300)$

b. $(Q = 200, P = \$400)$

c. $(Q = 100, P = \$600)$

d. The market demand curve doesn't have a kink point.

Need to draw the men & the women's demand curves & then sum them horizontally to get this answer

NOT SO BAD IF YOU GOT #21!

22. Using all the previous information, which is the equilibrium quantity of airplane tickets?

   a. 100 airplane tickets

   b. 200 airplane tickets

   (c.) 400 airplane tickets

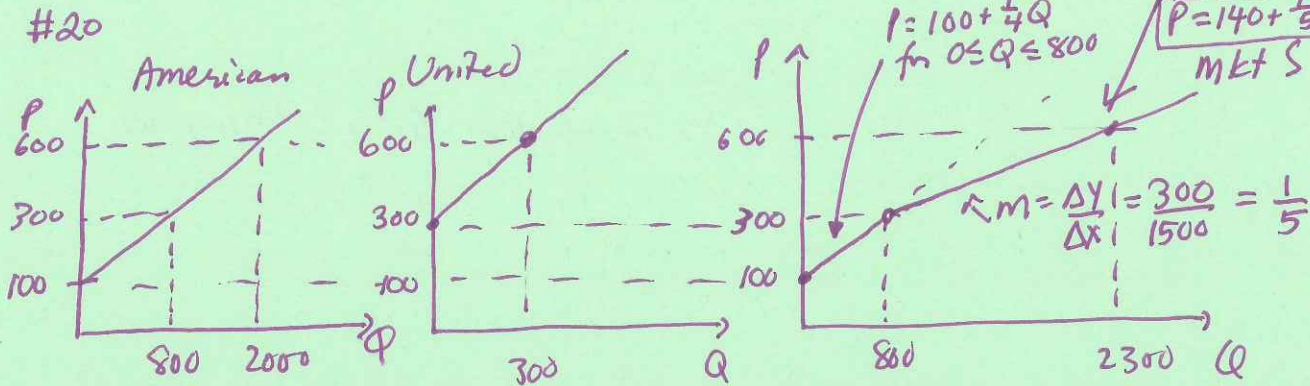   d. We don't have enough information to solve for the equilibrium quantity.

$y = mx + b$

$P = \frac{1}{5}Q + b$

$300 = \frac{1}{5}(800) + b$

$140 = b$

$\boxed{P = 140 + \frac{1}{5}Q \text{ for } 800 \le Q}$

#20

American

United

$P = 100 + \frac{1}{4}Q$ for $0 \le Q \le 800$

mkt S

$m = \frac{\Delta y}{\Delta x} = \frac{300}{1500} = \frac{1}{5}$

$300 = 100 + \frac{1}{4}Q$

$200 = \frac{1}{4}Q$

$800 = Q$

if $Q = 2000$

Then $P = 100 + \frac{1}{4}(2000)$

$P = 600$

if $P = 600$

then

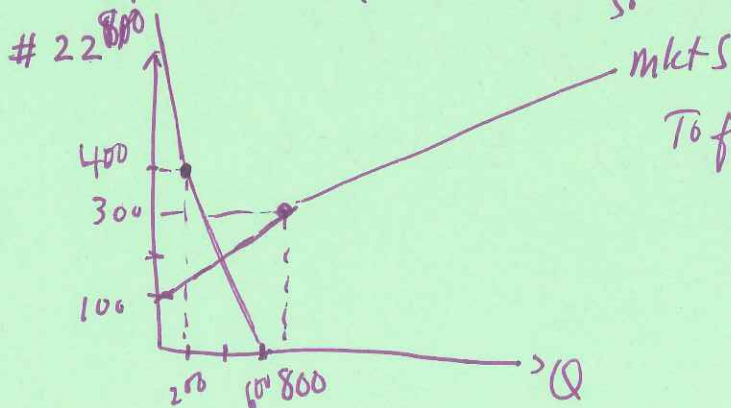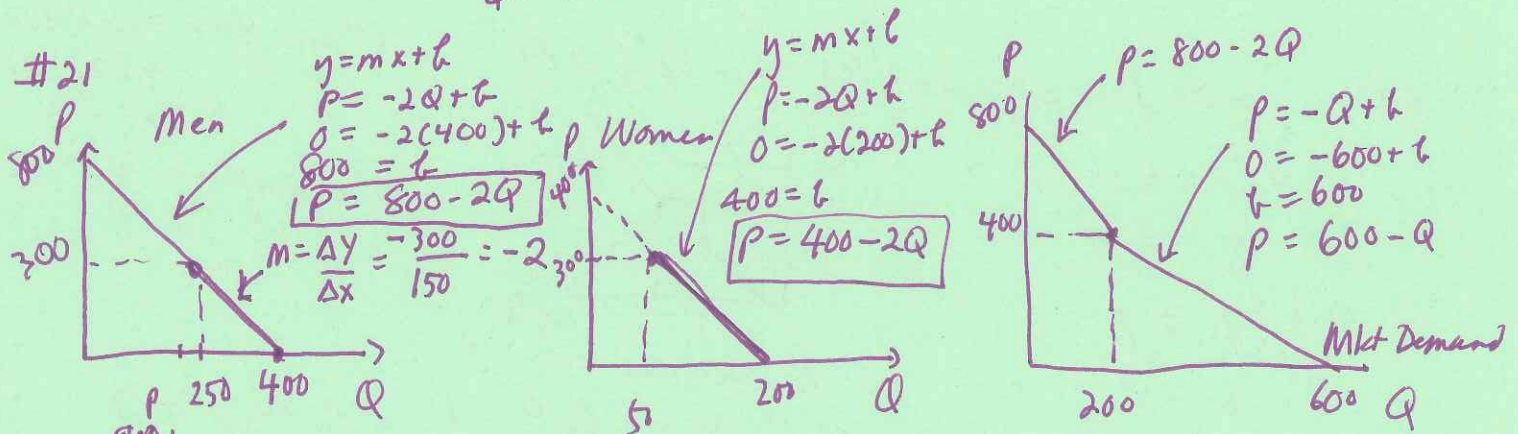$P = 300 + Q$

$600 = 300 + Q$

$Q = 300$

#21

Men

$y = mx + b$

$P = -2Q + b$

$0 = -2(400) + b$

$800 = b$

$\boxed{P = 800 - 2Q}$

$m = \frac{\Delta y}{\Delta x} = \frac{-300}{150} = -2$

Women

$y = mx + b$

$P = -2Q + b$

$0 = -2(200) + b$

$400 = b$

$\boxed{P = 400 - 2Q}$

$P = 800 - 2Q$

$P = -Q + b$

$0 = -600 + b$

$b = 600$

$P = 600 - Q$

Mkt Demand

#22

mkt S

To find equilibrium we need

D: $P = 600 - Q$

S: $P = 100 + \frac{1}{4}Q$

$600 - Q = 100 + \frac{1}{4}Q$

$500 = \frac{5}{4}Q$

$400 = Q$

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

In Oshkosh, Wisconsin the following equations describe the demand and supply for bananas where P is the price per banana and Q is the quantity of bananas:

Market demand: $Qd = 9 - P$

Market supply: $Qs = \frac{1}{2} P$

EASY

23. Suppose that the government establishes a price floor of $8 per banana. At that price floor:
    a. There is a shortage of 1 banana. ✗
    b. There is a shortage of 3 bananas. ✗
    c. There is a surplus of 3 bananas.
    d. At a price floor of $8 per banana there is not a surplus nor a shortage of bananas. ✗

↳ if effective $Q^S > Q^D \Rightarrow$ surplus

SOME WORK! NOT HARD

24. The government decides to repeal the price floor, so that the price and quantity are now determined by the market outcome. Which of the following statements accurately describes a consequence of the removal of the price floor?
    a. Total surplus increases by $6. ✓ *DWL = $6 w/ price floor*
    b. The producer surplus is smaller in the market equilibrium than it was with the price floor. ✗
    c. Consumer surplus increases by $2. ✗ *CS price floor = $.50   CS no price floor = $4.50*
    d. Nothing happens. The equilibrium quantity and equilibrium price stay the same as they were with the price floor. ✗ *Price floor was effective*
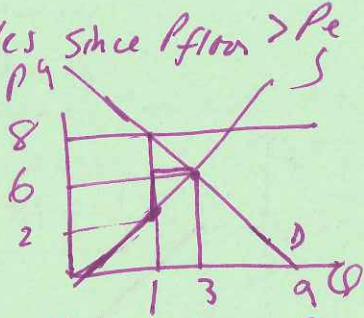
#23· Is price floor effective? Yes, since $P_{floor} > P_e$

$9 - P = \frac{1}{2} P$

$9 = \frac{3}{2} P$

$\frac{2}{3}(9) = P$

$6 = P$

is the surplus = 3 ?
at $P = 8 \Rightarrow Q^D = 1$
$Q^S = 4$ *} $Q^S - Q^D = 3$*

$PS\,price\,floor = (8-2)(1) + \frac{1}{2}(2)(1)$
$= 6 + 1 = \$7$
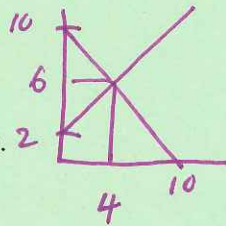
$PS\,no\,price\,floor = \frac{1}{2}(6-0)(3)$
$= \$9$

DWL w/ price floor $= \frac{1}{2}(8-2)(3-1) = \frac{1}{2}(6)(2) = 6$

(This page is intentionally left blank as an extra work sheet.)

DO NOT DETACH THIS SHEET FROM THIS EXAM BOOKLET!

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

[handwritten graph in top right: axes marked 10, 6, 2 on vertical; 4, 10 on horizontal with demand and supply lines crossing]

Suppose that the state government is trying to promote apple production in Eau Claire, Wisconsin. To do this, they implement a "Price Support Program" in which the government sets up a price floor and agrees to buy any surplus generated in the apple market. Assume that there are no storage costs to this program.

The following equations describe demand and supply in this market where P is the price per apple and Q is the quantity of apples:

Market demand: Qd = 10 - P

Market supply: Qs = P - 2

[handwritten:]
$P = 10 - Q$
$P = Q + 2$
$\left.\begin{array}{l}\end{array}\right\}$
$10 - Q = Q + 2$
$8 = 2Q$
$4 = Q$
$P = 6$

25. If the government has a limited budget of $54 to spend on this program and is trying to maximize as much as it can the producer's surplus, which price floor would the government select?

a. A price floor set at $5 will maximize producer's surplus while staying within the budget constraint. *[handwritten: X Below equilibrium price]*
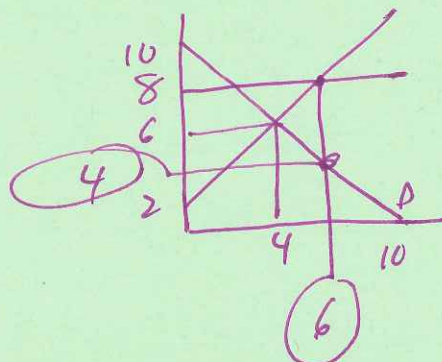
b. A price floor set at $7 will maximize producer's surplus while staying within the budget constraint. *[handwritten: at P=7, Q^D = 3, Q^S = 5 => surplus 2 units. Cost to gov't 2 X 7 = 14 / leftover budget => could ↑ PS w/ our budget]*

c. *[circled]* A price floor set at $9 will maximize producer's surplus while staying within the budget constraint. *[handwritten: at P=9, Q^D = 1, Q^S = 7 => Surplus 6 units. 6 X 9 = 54! gov't can afford this]*

d. A price floor set at $11 will maximize producer's surplus while staying within the budget constraint. *[handwritten: X at P = 11, Q^D = 0 => Q^S = 9. Cost to gov't 9 X 11 is greater than $54! Can't do this one w/ budget!]*

26. Suppose now that the government decides to change its policy and implement a "Price Guarantee Program" (a subsidy program) instead of a "Price Support Program". If the government implements a price guarantee of $8, how much money would the government spend on this program?

a. *[circled]* $ 24

b. $ 30

c. $ 36

d. $ 48

[handwritten graph: axes marked 10, 8, 6, 4, 2 on vertical; 4, 10 on horizontal, with 6 circled]
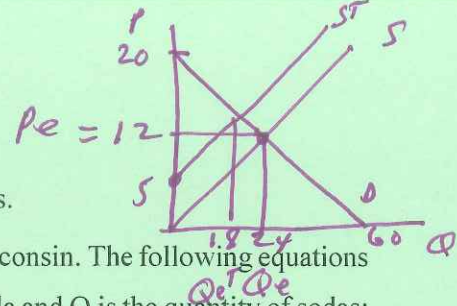
[handwritten:]
if P = 8, Q^S = 6
if Q = 6, the consumers would pay = 4
Cost to gov't = (8-4)(6) = $24

$\frac{1}{2}Q = 20 - \frac{1}{3}Q$

$3Q = 120 - 2Q$

$5Q = 120$

$Q = 24$

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

The state government wants to reduce the consumption of soda in Wisconsin. The following equations describe the market for soda in Wisconsin where P is the price per soda and Q is the quantity of sodas:

Market demand: Qd = 60 – 3P $\quad 3P = 60 - Q \quad\quad P = 20 - \frac{1}{3}Q$

$P = \frac{1}{2}Q$

Market supply: Qs = 2P

To reduce consumption of soda the government imposes an excise tax of $5 per soda that is levied on the consumers.

$S^T: \quad P = \frac{1}{2}Q + 5 \quad\quad \frac{1}{2}Q + 5 = 20 - \frac{1}{3}Q$

$3Q + 30 = 120 - 2Q$

[handwritten margin: SOMEWORK, NOT HARD]

27. This tax causes the quantity of soda consumed in equilibrium to decrease by approximately:

   $5Q = 90$
   $Q = 18$

   a. 16.67%
   (b.) 25%

   $\% \Delta \text{ in } Q = \left[\dfrac{Q_e^T - Q_e}{Q_e}\right](100\%)$

   c. 33.33%
   d. 66.67%

   $= \left[\dfrac{18 - 24}{24}\right]100\% = -\dfrac{6}{24}(100\%) = -25\%$

[handwritten margin: RELATIVELY EASY]

28. Fill in the following two blanks based on the information you have been given and holding everything else constant. The tax revenue from this excise tax of $5 per soda is equal to ___$90___. If the government decided to increase the excise tax by an additional $15 per soda, the tax revenue would _____.

   a. $100; increase. ✗
   (b.) $90; decrease. ✓
   c. $70; increase. ✗
   d. $60; decrease. ✗

   tax rev $= 5(18) = \$90$
   could stop here since only answer (b) has the right tax revenue

   $S^{T'}: P = \frac{1}{2}Q + 20$
   $\frac{1}{2}Q + 20 = 20 - \frac{1}{3}Q$
   $3Q + 120 = 120 - 2Q$
   $Q = 0$! no tax revenue, so tax rev ↓ !

29. Suppose now that after establishing the excise tax of $5 per soda, the government plans to use the tax revenue to reduce the consumption of soda even further. Which combination of the following additional policies would best accomplish the government's goal? Use the following assumptions in doing your analysis: 1) sugar cane is an input in the production of soda; 2) soda and coffee are substitutes in consumption; and 3) you use coffee beans to produce coffee.

   a. Establish an effective Price Support Program for coffee beans. ✗ Reduces Q coffee to consumers, ↑ P coffee
   (b.) Establish an effective Price Support Program for sugar cane where the government buys the surplus and then destroys the surplus. ✓
   c. Establish an effective Price Guarantee Program for sugar cane. ✗ Reduces P sugar cane & ↑ sugar cane consumers get
   d. Either (b) or (c) would be policies that would diminish the consumption of soda.