Economics 102
Summer 2018
First Midterm with Answers
June 7, 2018

Name *ANNOTATED KEY*

This exam consists of three parts: I) five binary choice questions worth 2 points each; II) twenty multiple choice questions worth 3 points each; and III) three short answer problems **worth** 30 points total. All answers should be clearly and legibly recorded on the exam booklet: any answer that is not legible will be counted as a wrong answer. All answers should be presented in a neat, logical fashion in the short answer portion of the exam.

Honor Code Statement:

I, _____, understand that it is important for me to do my own work. It is also important that I not provide help, either intentionally or unintentionally, to my fellow students. Therefore I will keep my answers covered and I will not provide answers to my classmates or take answers from my classmates. I also acknowledge that on this exam I may not have access to a calculator or a cellphone.

_____(Signed)

I.   Binary Choice Questions (out of a possible 10 points) _____
II.   Multiple Choice Points (out of a possible 60 points) _____
III.   Problems

       1. Problem 1 (out of a possible 10 points)   _____

       2. Problem 2 (out of a possible 10 points)   _____

       3. Problem 3 (out of a possible 10 points)   _____

TOTAL (out of a possible 100 points)   _____

I. Binary Choice Questions: (5 Questions worth 2 points each)

BE CAREFUL HERE!

1. Consider the following two supply curves where P is the price per unit and Q is the number of units:
    Supply Curve A: P = Q – 1
    Supply Curve B: P = Q – 5
Which of the following statements about the horizontal summation of these two curves is true? (As usual, restrict your attention to the first quadrant – i.e. where both price and quantity are positive.)
a. The horizontal summation of these two supply curves has a kink point.
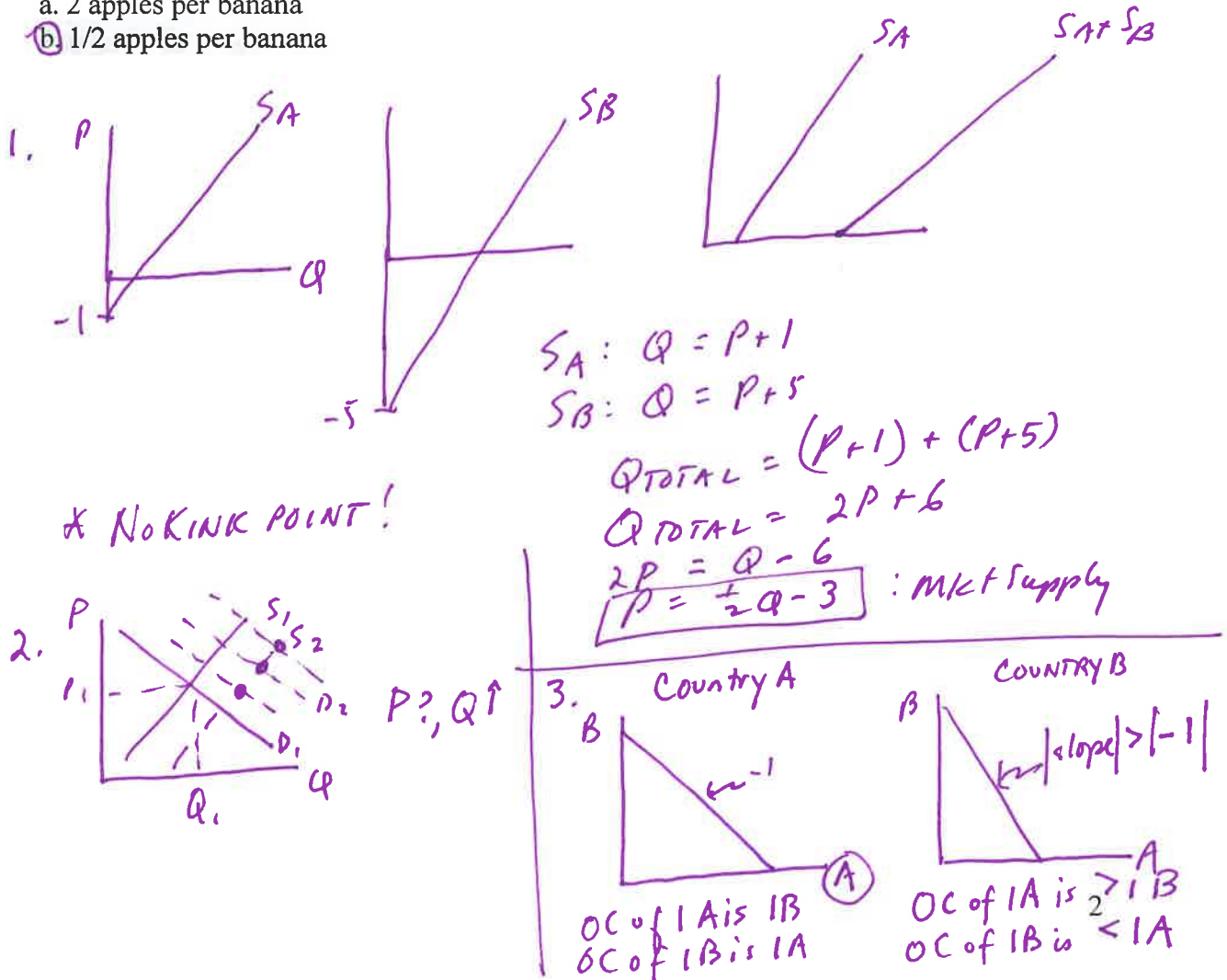(b.) The horizontal summation of these two supply curves has no kink point.

EASY

2. Suppose, in some market, demand shifts to the right, and, at the same time, supply shifts right. Then it must be the case that
a. The equilibrium price decreases. ✗
(b.) The equilibrium quantity increases.

A BIT OF WORK

3. Suppose both Country A and Country B produce apples and bananas. Assume that both countries have linear production possibility frontiers in the production of these two goods. If Country A sells apples to Country B for 1 banana per apple (suppose both countries strictly benefit from this trade), which of the following could be the opportunity cost of bananas for Country B?
a. 2 apples per banana
(b.) 1/2 apples per banana

Handwritten work:

1. Graph showing S_A, S_B, and $S_A + S_B$ curves.

* No kink point!

$S_A: Q = P + 1$
$S_B: Q = P + 5$

$Q_{TOTAL} = (P+1) + (P+5)$
$Q_{TOTAL} = 2P + 6$
$2P = Q - 6$
$\boxed{P = \frac{1}{2}Q - 3}$: Mkt Supply

2. Graph with S_1, S_2, D_1, D_2, Q_1. $P?$, $Q\uparrow$

3. Country A graph, slope -1, OC of 1 A is 1B, OC of 1B is 1A

Country B graph, $|slope| > |-1|$, OC of 1A is $> \frac{1}{2}$ 1B, OC of 1B is $< 1A$

4. Suppose beer and cheese curds are complements. Suppose the free-market equilibrium price of cheese curds is $5 per serving, and the government implements a price guarantee program in this market such that the producers of cheese curds now receive a price of $10 (that is, the government subsidizes the sale of cheese curds). Given this information and holding everything else constant, how will the equilibrium price of beer react?
a. The equilibrium price of beer will increase.
b. The equilibrium price of beer will decrease.

5. Alex can eat 5 cones of ice-cream or 4 doughnuts in one hour. Ben can eat 6 cones of ice-cream or 9 doughnuts in one hour. Choose the correct option.
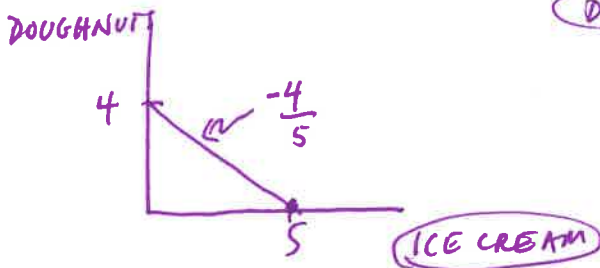a) Alex has a comparative advantage in eating doughnuts.
b) Ben has a comparative advantage in eating doughnuts.

4. $P_{CC} = \$5 \Rightarrow P_{CC}' \uparrow \text{ to } \$10$
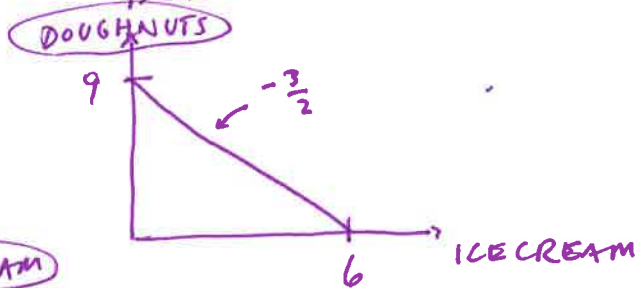
Beer & Cheese curds are complements

if $P_{CC} \uparrow$, $Q_{Beer} \downarrow$ since as $P_{CC} \uparrow$, $Q_{CC}^D \downarrow$
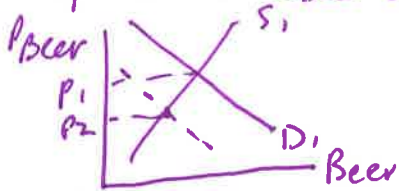
5. ALEX 1 HOUR   BEN 1 HOUR

OC of 1 ICECREAM is 4/5 DOUGHNUT   OC of 1 ICECREAM is 3/2 DOUGHNUT

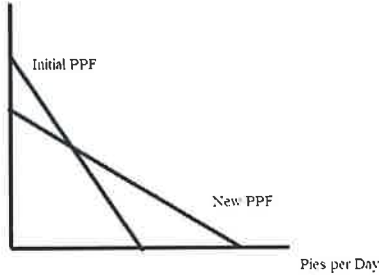ALEX COMP ADV IN EATING ICE CREAM, ∴ BEN HAS COMP. ADV IN EATING DOUGHNUTS

3

II. Multiple Choice Questions: (20 Questions worth 3 points each)

NOT HARD

6. Sally can spend her time making either pies or cookies. Which of the following scenarios could explain the following change in Sally's PPF?

Cookies per Day

Initial PPF

New PPF

Pies per Day

FROM THE DIAGRAM WE SEE THE NEW PPF HAS SALLY INCREASING PIE PRODUCTION AND DECREASING COOKIE PRODUCTION

a. Sally gets a new mixer that improves her ability to make both cookies and pies.
b. Sally gets a new pie dish that improves her ability to make pies but is useless for cookies. ✗
c. Sally gets a new pie dish that improves her ability to make pies, but accidentally breaks her favorite cookie sheet, reducing her ability to make cookies.
d. Sally gets a new cookie sheet that improves her ability to make cookies, but accidentally breaks her favorite pie dish, reducing her ability to make pies.

NOT HARD

7. Consider the market for lettuce. Suppose a severe draught makes it much harder to grow lettuce, and, at the same time, a new fad starts causing people to want to buy less lettuce. Holding everything else constant, which of the following describes the change in equilibrium price and quantity following this change?
a. The equilibrium price of lettuce increases, and the equilibrium quantity of lettuce decreases relative to the initial equilibrium.
b. The equilibrium price of lettuce increases, and the change in the equilibrium quantity of lettuce is indeterminate relative to the initial equilibrium.
c. The change in the equilibrium price of lettuce is indeterminate, and the equilibrium quantity of lettuce decreases relative to the initial equilibrium.
d. The change in both the equilibrium quantity and the equilibrium price of lettuce are indeterminate relative to the initial equilibrium. ✗

4
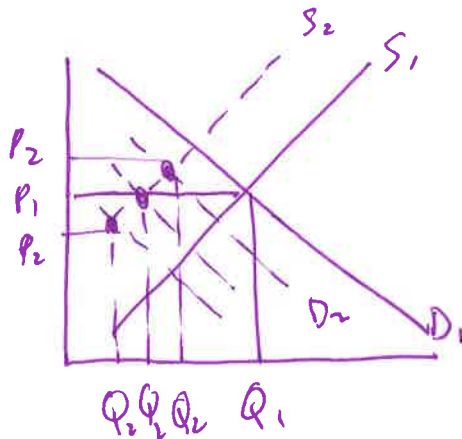
Use the following information for the next **two (2)** questions.

Sally and Olympia spend their free time either watching their favorite show or playing tennis. If Olympia only watches shows, she can watch 20 episodes in a day. If she only plays tennis, Olympia can play 10 matches a day. If Sally only watches shows, she can watch 40 episodes in a day. If Sally only plays tennis, she can play 25 matches a day.
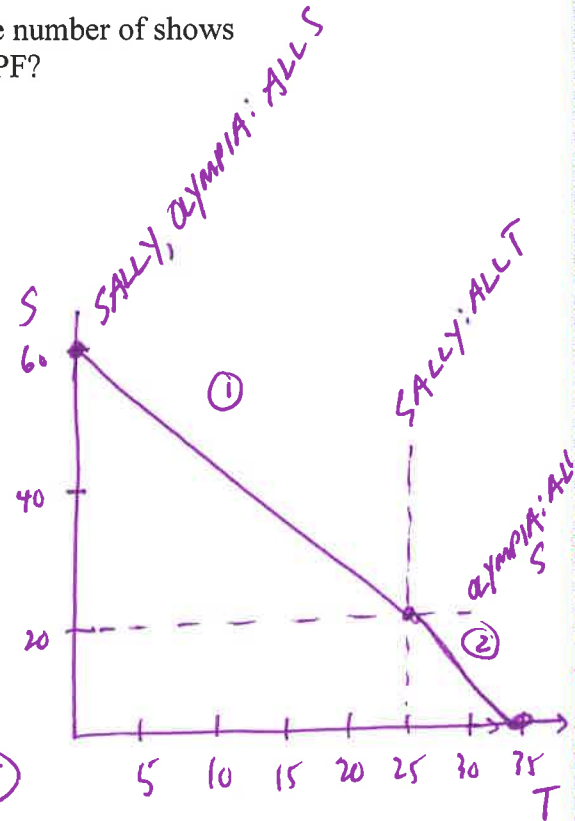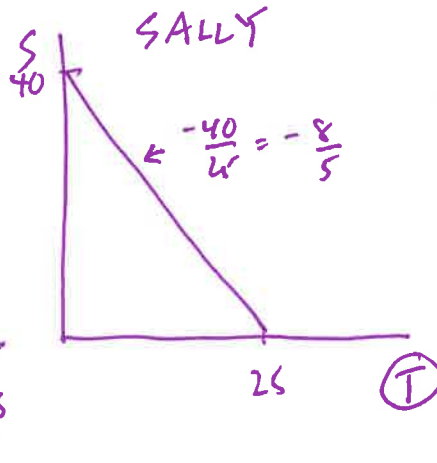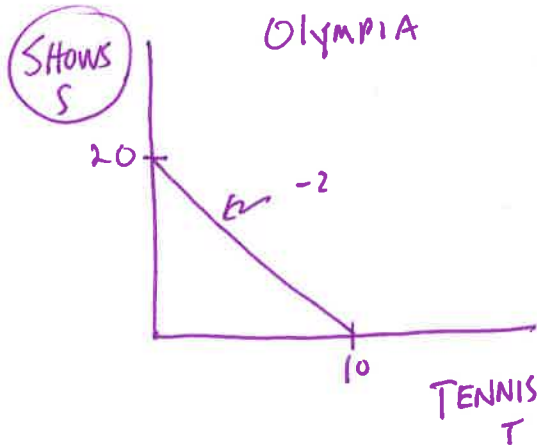
NOT HARD 8. Which of the following production bundles is feasible for Olympia?
   a. 0 tennis matches and 5 TV shows
   b. 0 tennis matches and 25 TV shows ✗
   c. 10 tennis matches and 10 TV shows ✗
   d. 5 tennis matches and 15 TV shows ✗

PREDICTABLE 9. Let T denote the number of tennis matches, and S denote the number of shows watched. What is the equation for Olympia and Sally's joint PPF?
   a. $S = 60 - (8/5)T$ for $T < 25$ ✓
      $S = 70 - 2T$ for $T \geq 25$ ✓
   b. $S = 60 - (8/5)T$ for $T < 25$ ✓
      $S = 64 - (8/5)T$ for $T \geq 25$ ✗
   c. $S = 60 - 2T$ for $T < 10$ ✗
      $S = 56 - (8/5)T$ for $T \geq 10$
   d. $S = 60 - 2T$ for $T < 25$ ✗
      $S = 56 - (8/5)T$ for $T \geq 25$

OLYMPIA

SALLY

SHOWS S

20

$\swarrow -2$

TENNIS T

$\frac{S}{40}$

$\leftarrow \frac{-40}{25} = -\frac{8}{5}$

25

T

SALLY, OLYMPIA: ALL S

S
60

40

20

SALLY: ALL T

OLYMPIA: ALL S

①

②

5 10 15 20 25 30 35
T

① $S = 60 - \frac{40}{25}T$
$S = 60 - \frac{8}{5}T$ (OR $20 \leq S \leq 60$
                           OR $0 \leq T \leq 25$)

② $S = mT + \ell$
$S = -2T + \ell$
$0 = -2(35) + \ell$
$70 = \ell$
$\boxed{S = 70 - 2T \quad \text{FOR} \quad 25 \leq T \leq 35}$

10. Amy's company produces 1000 widgets in 2015 and sells 600 of these widgets for $20 each. In 2016 Amy's company produces 700 widgets and sells 800 widgets for $20 each. Which of the following tables accurately displays the impact of these transactions on GDP?

Table A:	
Consumption spending in 2015	$12,000
Investment spending in 2015	$12,000 ✗
GDP in 2015	$20,000 ✗
Consumption spending in 2016	$16,000
Investment spending in 2016	-$2000
GDP in 2016	$14,000

implies a higher #

Table C:	
Consumption spending in 2015	$12,000
Investment spending in 2015	$8,000
GDP in 2015	$20,000
Consumption spending in 2016	$16,000
Investment spending in 2016	$2000 ✗
GDP in 2016	$18,000

Table B:	
Consumption spending in 2015	$20,000 ✗
Investment spending in 2015	-$8,000
GDP in 2015	$12,000
Consumption spending in 2016	$16,000
Investment spending in 2016	-$2000
GDP in 2016	$14,000

| Table D:	
Consumption spending in 2015	$12,000 ✓
Investment spending in 2015	$8,000 ✓
GDP in 2015	$20,000 ✓
Consumption spending in 2016	$16,000 ✓
Investment spending in 2016	-$2000 ✓
GDP in 2016	$14,000 ✓

a. Table A
b. Table B
c. Table C
(d.) Table D

Extra Workspace: Do Not Remove the Staple!

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

The graph below illustrates the PPF for Arcadia, a small economy composed of three individuals - Sally, Martha, and Justin - that produce teapots and mugs. Assume that each segment in the joint PPF for Arcadia is linear. You are also provided the following information:

- Justin's opportunity cost of producing one mug is 1 teapot
- Sally has the comparative advantage in producing mugs relative to Martha

Joint PPF

Handwritten annotations:
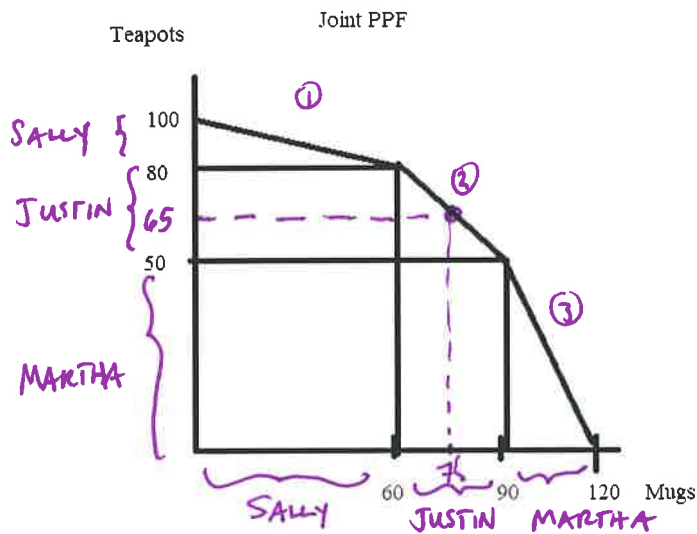
11. Need EQ for ②:
$$T = mM + b$$
$$T = -M + b$$
$$80 = -60 + b$$
$$140 = b$$

$$\Rightarrow T = 140 - M$$
if $T = 64$
$$64 = 140 - M$$
$$M = 76$$

MUG PRODUCTION = 76
SALLY'S MUG PRODUCTION = 60
JUSTIN'S MUG PRODUCTION = 16

① $T = 100 - \frac{1}{3}M$
③ $T = -\frac{5}{3}M + b$
  $T = 200 - \frac{5}{3}M$

SOME WORK 11. If Arcadia is currently 64 producing teapots a year, what is the maximum amount of mugs that Arcadia can produce given its teapot production? How many mugs is Justin producing when Arcadia is producing 64 teapots and operating at an efficient point on the joint PPF? ✓ ✓

a. 76 mugs; 16 mugs
b. 50 mugs; 14 mugs
c. 60 mugs; 60 mugs
d. 72 mugs; 0 mugs

SOME WORK 12. Given Arcadia's PPF which of the following points (mugs, teapots) is **not** feasible for Arcadia?

a. (75, 65) Efficient
b. (82, 60)
c. (102, 28)
d. (42, 84)

Handwritten annotations:

ⓐ $T = 140 - M$ if $M = 75 \Rightarrow T = 65$

ⓑ if $M = 82 \Rightarrow T = 140 - 82 \Rightarrow T = 58$
  (82, 60) IS NOT FEASIBLE

ⓒ IF $M = 102 \Rightarrow T = 200 - \frac{5}{3}(102)$
  $T = 200 - 5(34)$
  $T = 200 - 170 = 30$
  (102, 28) IS FEASIBLE (INSIDE PPF)

ⓓ IF $M = 42 \Rightarrow T = 100 - \frac{1}{3}(42)$
 $T = 100 - 14 = 86$
  (42, 84) IS FEASIBLE (INSIDE PPF)

8

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

        I. If this economy produces 70 mugs and 70 teapots, then Martha will produce 50 teapots, and Sally will produce 60 mugs. TRUE

        II. The equation for Martha's PPF is: $T = 20 - (1/3)M$ FALSE

        III. Justin is willing to sell 1 mug for 1 teapot and Martha is willing to accept this price. TRUE

        IV. If the price of 1 mug is greater than 5/3 teapots then Martha will be unwilling to buy the mug from Sally but Martha will be willing to buy the mug from Justin. NO

  a. Statements I, II, III and IV are all true statements.

  b. Statements I and III are a true statements.

  c. Statement I is a true statement.

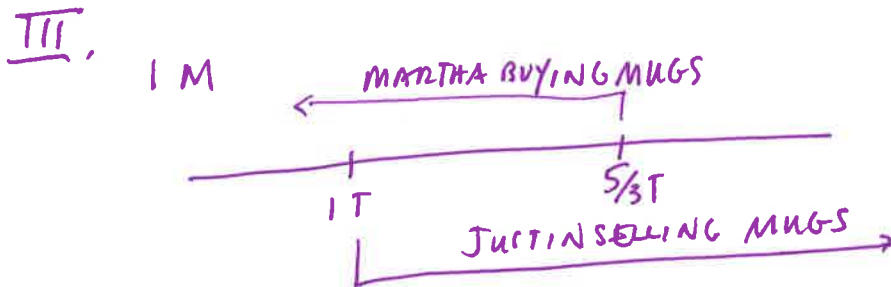 d. Statements I, III and IV are true statements.

I. $(70, 70)$ ⇒ FROM GRAPH

  MUG PRODUCTION:

    SALLY ⇒ 60 MUGS

    JUSTIN ⇒ 10 MUGS

TEAPOT PRODUCTION

  MARTHA ⇒ 50 TEAPOTS

  JUSTIN ⇒ 20 TEAPOTS

II.
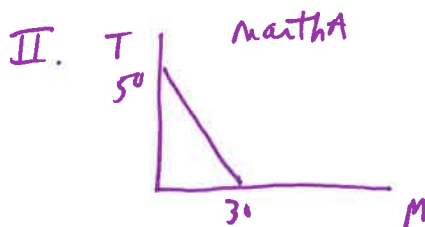
$$T = 50 - \frac{5}{3}M$$

OC of 1M is 5/3 T

OC of 1T is 3/5 M

III.

MARTHA BUYING MUGS

JUSTIN SELLING MUGS

IV. LOOK AT III ; LAST PART OF IV IS EASILY SEEN AS FALSE

NOT HARD 14. Zumbia reports:
- that its unemployment rate is at its lowest level for the past ten years; *POSITIVE*
- the senior economist for Zumbia's government states that "the unemployment rate should be low given the policies that we have instituted over the past decade"; *NORMATIVE*
- and the President of Zumbia states that addressing unemployment issues through policy will be the primary goal of the current administration. *NORMATIVE*

Given these three statements, how many are normative?
a. One statement is normative.
b.) Two statements are normative.
c. Three statements are normative.
d. None of these statements are normative.

EASY 15. Suppose Pat, Morey, and David are all working on homework together. Assume that their individual PPFs are linear. In one hour, Pat can solve either 4 chem problems or 2 stat problems. In one hour, Morey can solve either 3 chem problems or 6 stat problems. In two hours, David can solve either 4 chem problems or 6 stat problems. If the three efficiently work together on these problems, which of the following cannot happen?

a. Pat, Morey, and David all produce only chem problems. *THIS IS POSSIBLE*

b. Pat and David produce only chem problems, and Morey only produces stat problems. *THIS IS POSSIBLE*

c. Pat and Morey only produce stat problems, and David only produces chem problems. ✗

d. Pat produces only chem problems, Morey produces only stat problems, and David produces some of both types of problems. *THIS IS POSSIBLE*

10
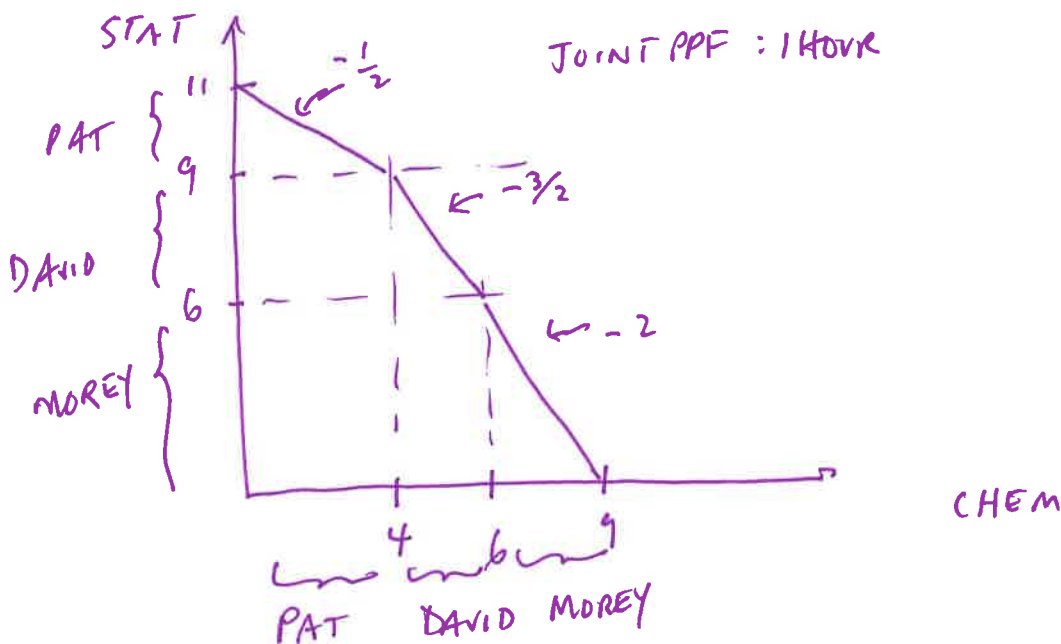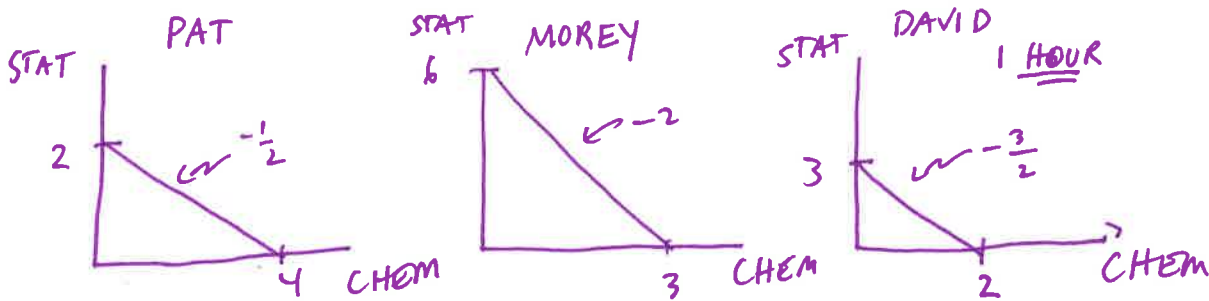
Use the information below to answer the next **two** questions.

Green Corporation is a gadget production company that produces gadgets. In producing gadgets, Greenland uses iron produced by Ironworks Inc. and rubber produced by Bouncy Products. Ironworks Inc. sells some of its product as an intermediate good and some of its product as a final good. Bouncy Products sells all of their product to Greenland as an intermediate good. The following table summarizes the transactions that go into the production of gadgets, iron and rubber during the year 2012.

	Ironworks Inc.	Bouncy Products	Greenland Corporation
Wages	$500	$400	$300
Rent	$100	$200	$200
Profits	$100	$100	$200
Interest	$50	$20	$30
Intermediate Goods	$0	$600	$1500
Total Revenues	$800	$1500	$2,000

NOT HARD 16. Given the above information, what is the contribution to GDP from this transaction for the year 2012?
a. $2000
b. $2200
c. $4300
d. $2800

WAGES + RENT + PROFITS + INTEREST = GDP
1200 + 500 + 400 + 100 = GDP
2200 = GDP

NOT HARD 17. Given the above information, what is the value added by Greenland Corporation?
a. $2000
b. $1500
c. $500
d. $3500

VA by GREENLAND = TOTAL REV – INTERMEDIATE GOODS

= 2000 - 1500

SOME WORK 18. The market for comic books consists of two buyers (Molly and Sam) and one seller. The buyers' individual demand curves are described by the following equations where P is the price per book and Q is the quantity of books:

Molly's demand curve: $P = 10 - Q$

Sam's demand curve: $P = 5 - Q$

The seller has a supply curve given by:

Seller's supply curve: $P = 4 + (1/2)Q$

Which of following gives the correct equilibrium price (P*) and quantity (Q*) in this market?

a. P* = $4 per book; Q* = 6 books
b. P* = $5 per book; Q* = 5 books
c. P* = $6 per book; Q* = 4 books ✔
d. P* = $8 per book; Q* = 6 books

SOME WORK 19. Consider a normal market with a downward-sloping demand curve and an upward-sloping supply curve. Which of the following cases would definitely result in a decrease in consumer surplus? For each case, assume that the market is initially in equilibrium and that everything else is held constant except for the change described in the case.

Case 1: The supply curve shifts to the left. *CS↓*
Case 2: The supply curve shifts to the right. *CS↑*
Case 3: The government imposes an effective price ceiling. *CS↑*
Case 4: The government imposes an excise tax. *CS↓*

a. Only Case 1
b. Only Case 4
c. Both Cases 1 and 4
d. Cases 2, 3, and 4
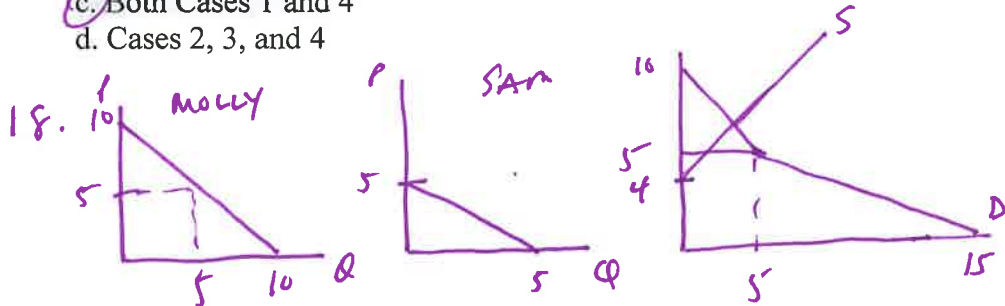
NEED MOLLY'S DEMAND ONLY!

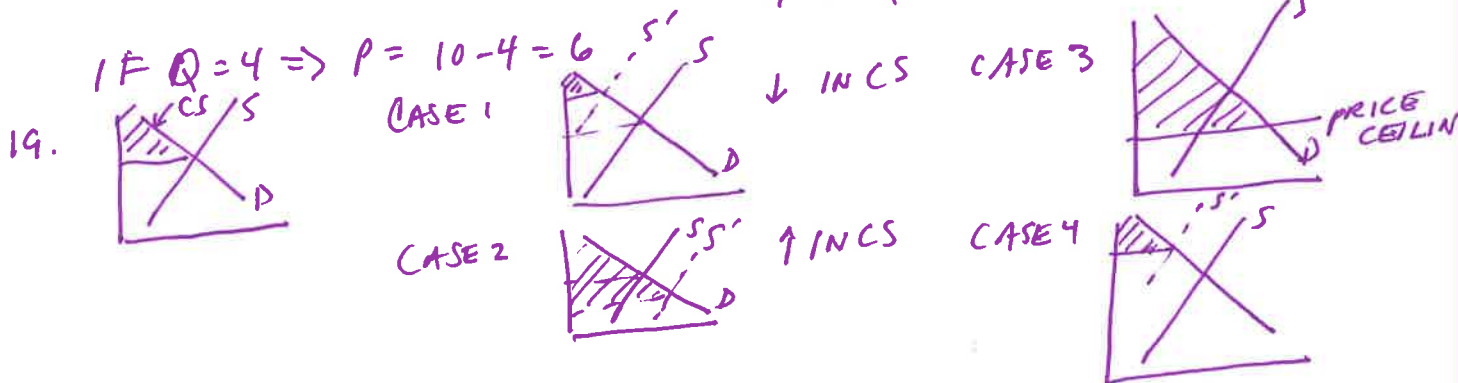$10 - Q = 4 + \frac{1}{2}Q$
$20 - 2Q = 8 + Q$
$12 = 3Q$
$4 = Q$ ⟹ ELIMINATES (a)(b) & (d)

IF $Q = 4 ⟹ P = 10 - 4 = 6$

CASE 1   ↓ IN CS   CASE 3

CASE 2   ↑ IN CS   CASE 4   PRICE CEILING

12

NOT HARD 20. Which of the following scenarios will cause the equilibrium price of bacon to move in a direction different than the other three scenarios?
    a. New research comes out claiming the consumption of bacon reduces the risk of cancer.
    b. The price of pork bellies (an input into the production of bacon) increases.
    c. Income falls, and bacon is a normal good.
    d. The price of sausage (a substitute in consumption for bacon) increases.

(a) P_{BACON} ↑

(b) I_{BACON} ↑

(c) I_{BACON} ↓

(d) P_{BACON} ↑
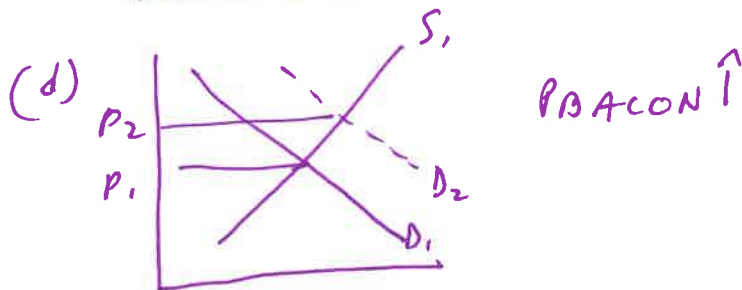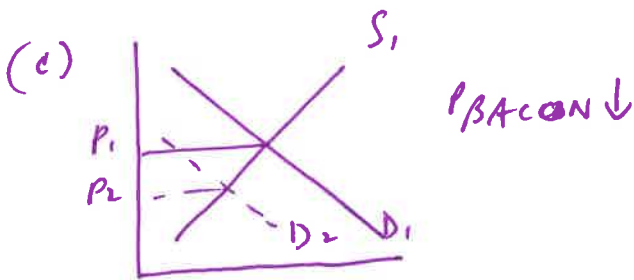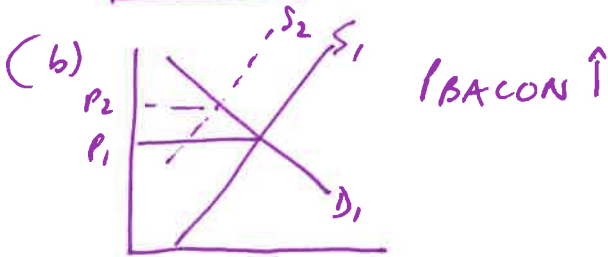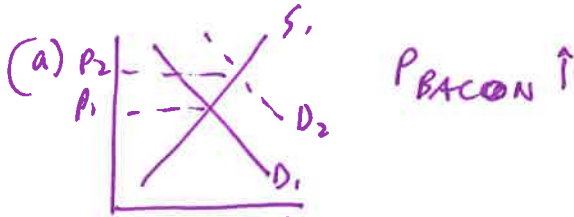
Use the following information to answer the next **three** questions.

Consider the market for bicycles in Millarville, a small closed economy. Currently the domestic demand and supply curves for bicycles are given by the following equations where Q is the quantity of bicycles and P is the price of bicycles:

Domestic Demand: $Q = 500 - (1/2)P$
Domestic Supply: $Q = (1/2)P - 100$

The current world price for bicycles is $250.

21. Given the above information how many of the following statements are true?
    - If this market opens to trade, then domestic producers will earn total revenue equal to $6250. TRUE
    - If this market opens to trade, consumer surplus with trade (CStrade) will be 225 times bigger than producer surplus with trade (PStrade). TRUE
    - If this market opens to trade the level of imports will be greater than the domestic level of production. TRUE
    - If this market operates as a closed market the deadweight loss in this market will be less than $100,000. TRUE
    a. One statement is true.
    b. Two statements are true.
    c. Three statements are true.
    (d.) Four statements are true.

22. Suppose this market opens to trade but that the ruler in Millarville wishes to impose a tariff that maximizes the amount of tariff revenue the government will earn. Given the successful implementation of this goal and holding everything else constant, how many bicycles will be imported?
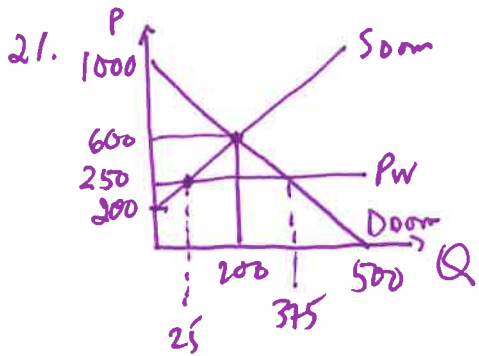   a. 150 bicycles
    b. 200 bicycles
    c. 160 bicycles
    (d.) 175 bicycles

23. Given the tariff described in the last question, the area of deadweight loss due to using the less efficient, domestic producers rather than the more efficient, foreign producers is:
    a. greater than $8100.
    (b.) less than $8100.
    c. greater than $16,200.
    d. less than $16,200 but greater than $8100.

14

21.

$$500 - \tfrac{1}{2}P = \tfrac{1}{2}P - 100$$
$$600 = P$$
$$Q = \tfrac{1}{2}(600) - 100 = 200$$

if $P = 250$
$$Q^0_{dom} = 500 - \tfrac{1}{2}(250)$$
$$= 500 - 125 = 375$$

$$Q^S_{dom} = (\tfrac{1}{2})(250) - 100$$
$$= 125 - 100 = 25$$

- TR for DOMESTIC PRODUCERS IF OPEN TO TRADE:
  $$TR = P \cdot Q$$
  $$TR = P_W \, Q^S_{dom} = 250(25) = 6250 \Rightarrow TRUE$$

- CS TRADE $= \tfrac{1}{2}(1000 - 250)(375)$
  $$= \tfrac{1}{2}(750)(375)$$
  $$= (375)(375)$$

PS TRADE $= \tfrac{1}{2}(250 - 200)(25)$
$$= \tfrac{1}{2}(50)(25)$$
$$= (25)(25) = 625$$

— COMPARE
(375)(375)   vs (25)(25)
(25×15)(25×15) vs (25)(25)
(15)(15)(25)(25)
225 (25)(25) ⟹ TRUE ✦

- IMPORTS WITH TRADE $= 375 - 25 = 350$ } ⟹ TRUE
  DOMESTIC PRODUCTION WITH TRADE $= 25$

- DWL CLOSED ECONOMY $= \tfrac{1}{2}(600 - 250)(375 - 25)$
  $$\approx (400)(400) = \tfrac{160,000}{2} = 80,000$$
  $$\approx (300)(300) = 45,000$$
  $$= \tfrac{1}{2}(350)(350)$$
  $$= \tfrac{1}{2}(122\,500)$$
  $$= 61,250$$

  HERE'S A SHORTCUT!!

```
    112.5
    25
    47.5
```

```
   350
   350
  17500
 105000
 122500
```

22. TARIFF THAT MAXIMIZES REVENUE ⟹ MIDWAY B/W
$250/BIKE & $600/BIKE ⟹ $\frac{350}{2} = 175 \Rightarrow P_W + 175 = 250 + 175 = \$425$
IF $P_{TARIFF} = 425 \Rightarrow Q^D_{dom \, w/TARIFF} = 500 - (425)(\tfrac{1}{2}) = 500 - 212.5 = 287.5$
$Q^S_{dom \, w/TARIFF} = \tfrac{1}{2}(425) - 100 = 212.5 - 100 = 112.5$
$Q^D - Q^S = \#\text{of IMPORTS} = 287.5 - 112.5 = 175$

24.
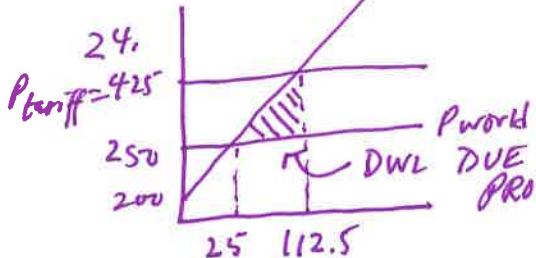
DWL DUE TO USING MORE EXPENSIVE, LESS EFFICIENT DOMESTIC
PRODUCER ⟹ DWL $= \tfrac{1}{2}(425 - 250)(112.5 - 25)$
$$= \tfrac{1}{2}(175)(87.5)$$
$$= (87.5)(87.5)$$

$90 \times 90 = 8100$ } DWL < 8100
$80 \times 80 = 6400$

15

Use the following information to answer the next **two** questions:

Smithville has a population of 20,000 people. Of those 20,000 people there are 2,000 children and teenagers who are less than sixteen years old; everyone else in this economy is at least 16 years old. There are also 1000 homemakers who are satisfied with being at home and are not actively seeking employment outside the home. There are 1000 retired people who are no longer seeking employment. The rest of the population is civilian and non-institutionalized. Within the civilian non-institutionalized population there are 400 people who are currently not working, are available to work, and are actively submitting job applications every week. There are another 400 people who are currently not working, are available to work, but who have quit submitting job applications because they believe there are no jobs available to them. There are also 12,000 full-time employed people; 2,600 part-time employed people who are satisfied with their job status; and 600 part-time employed people who would prefer to work full-time but are unable to locate full-time jobs in this economy.

A LOT OF SORTING: NOT HARD

24. Given the above information, the unemployment rate in Smithville is approximately
a. 2.0%
b. 2.6%
c. 3.0%
d. 3.6%

NOT HARD

25. Suppose that Smithville decides to include discouraged workers as unemployed workers when calculating the unemployment rate. If Smithville makes this change, the unemployment rate given the above information will _____ since both the numerator and the denominator of the ratio will increase by the same amount.
a. not be impacted by this change
b. increase to 4%
c. increase to 5%
d. decrease to 4%

$$25. \; U'RATE = \frac{800}{16000}[100] = 5\%$$

24.
20,000
2 000 Kids
────────
18 000
−1 000 HOMEMAKERS ⟹ NOT IN LF
────────
17 000 RETIRED ⟹ NOT IN LF
−1 000 CIVILIAN NON-INSTITUTIONALIZED
────────
16 000
↳ 400 NOT WORKING ⟹ U
400 NOT WORKING ⟹ NOT SUBMITTING APPLICATIONS ⟹ NOT IN LF
12,000 E FULL-TIME
2600 E PART-TIME ⟹ SATISFIED
600 E PART-TIME ⟹ WANTING FULL-TIME

$$U_{RATE} = \frac{U}{U+E}[100\%] = \frac{400}{400+12000+2600+600}(100\%) = \frac{400}{15600}[100]$$

$$= \frac{100}{39}$$

$$39\overline{)100.00} \quad 2.56 \approx 2.6\%$$
78
────
22 0
19 5
────
2 50

16

Extra Workspace: Do Not Remove the Staple!

Part III: Short Answer Problems (three worth a total of 30 points)

1. (Worth a total of 10 points) Consider an economy composed of three individuals: Bob, Sue and Ann. These three individuals produce cupcakes (C) and brownies (B). All three individuals have the same amount of resources available to them to produce these two goods. All three individuals have linear production possibility frontiers in the production of these two goods.

   You are told that Bob can produce (B, C) = (4, 6) or (2, 8) or any combination that lies on the line containing these two points. Sue can produce (B, C) = (10, 0) or (8, 1) or any combination that lies on the line containing these two points. Ann can produce (B, C) = (5, 0) or (0, 5) or any combination that lies on the line containing these two points.

a. (1 point) Given the above information, who has the comparative advantage in the production of brownies? _SUE HAS COMP ADV IN PRODUCTION OF BROWNIES_
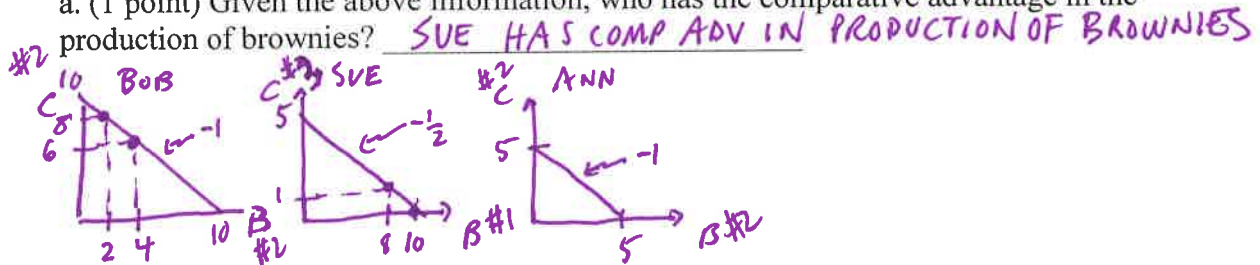
b. (1 point) Given the above information, what is Bob's opportunity cost of producing 2 cupcakes? ___2 BROWNIES___

c. (1 point) Given the above information, who has the absolute advantage in the production of cupcakes? ___BOB___

d. (1 point) Given the above information, write an equation for Sue's production possibility frontier in y-intercept form. For this question you should measure brownies on the horizontal axis. ___$C = 5 - (1/2)B$___

18

e. (2 points) In the space below draw the joint PPF for these three individuals. Make sure you label both axes. Make sure you identify the y-intercept, the x-intercept, and the coordinates of all kink points in your drawing.
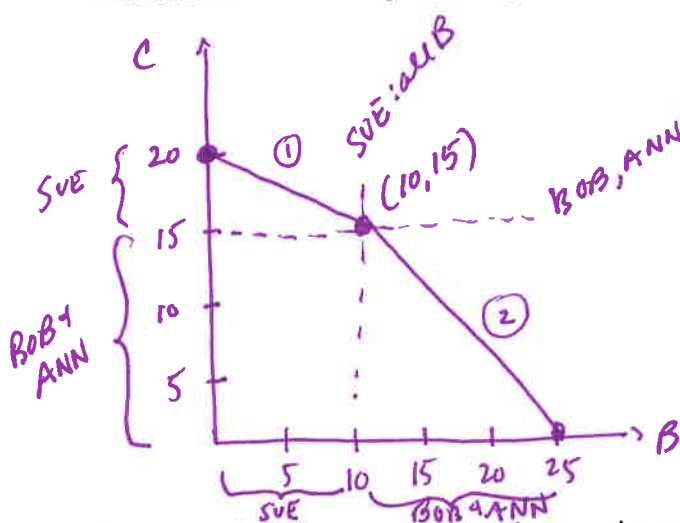

ONLY ONE KINK SINCE BOB & ANN HAVE PPFs WITH THE SAME SLOPE

① $C = 20 - (\frac{1}{2})B$ for $15 \le C \le 20$

② $\left.\begin{array}{l} C = -B + b \\ 0 = -25 + b \\ b = 25 \end{array}\right\} \Rightarrow \begin{array}{l} C = 25 - B \\ \text{for } 0 \le C \le 15 \end{array}$

f. (2 points) In the space below draw an image representing the acceptable range of trading prices for 1 brownie in this economy. Use the number line approach presented in class. In your image make sure you include:
- arrows and labels as follows:
  - "Ann (buying or selling) brownies"
  - "Bob (buying or selling) brownies"
  - "Sue (buying or selling) brownies"
- what the acceptable range of trading prices is for the three individuals
- clearly labeled presentation
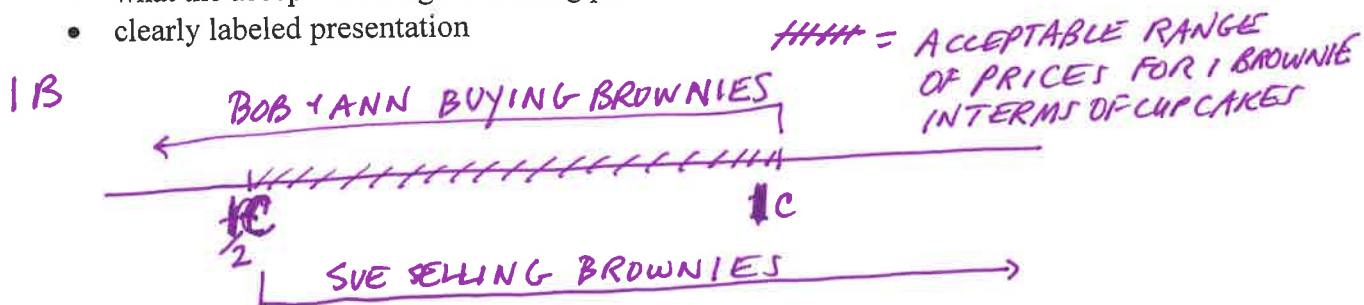
g. (2 points) Consider each of the following combinations and determine whether the combination is feasible and/or efficient for these three individuals to produce. Fill in the table with your answers. Note that some cells may be left empty.

Combination	Feasible/Not Feasible	Efficient/Not Efficient
(B, C) = (20, 5)	FEASIBLE	EFFICIENT
(B, C) = (17, 9)	NOT FEASIBLE	BEYOND THE PPF
(B, C) = (8, 17)	NOT FEASIBLE	BEYOND THE PPF
(B, C) = (4, 14)	FEASIBLE	NOT EFFICIENT

If $B = 20 \Rightarrow C = 25 - 20 = 5$
If $B = 17 \Rightarrow C = 25 - 17 = 8$
If $B = 8 \Rightarrow C = 20 - \frac{1}{2}(8) = 16$
If $B = 4 \Rightarrow C = 20 - \frac{1}{2}(4) = 18$

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2. (Worth a total of 10 points) Suppose the small, closed economy of Piedmont's market for watches can be described by the following domestic demand and domestic supply equations where P is the price of a watch and Q is the number of watches:

Domestic Demand: P = 100 - Q
Domestic Supply: P = 10 + (5/4)Q
World Price of Watches = $20 per watch

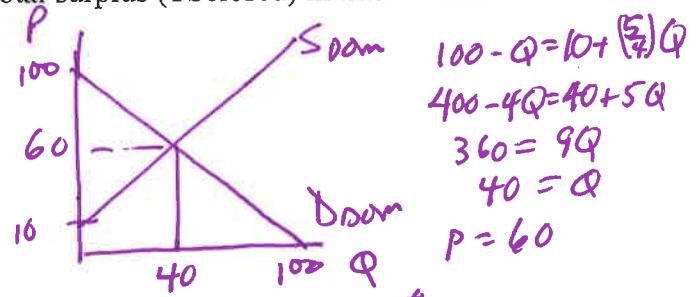a. (3 points) If this market is closed to trade, what will be the value of consumer surplus (CSclosed), producer surplus (PSclosed), and total surplus (TSclosed) in this market? Show your work.

CSclosed = _____ #800 _____

PSclosed = _____ $1000 _____

TSclosed = _____ $1800 _____

S_{Dom} $100 - Q = 10 + (\frac{5}{4})Q$
$400 - 4Q = 40 + 5Q$
$360 = 9Q$
$40 = Q$
D_{Dom} $P = 60$

$CS_{closed} = \frac{1}{2}(100 - 60)(40 - 0) = \frac{1}{2}(40)(40) = 20(40) = \$800$

$PS_{closed} = \frac{1}{2}(60 - 10)(40 - 0) = \frac{1}{2}(50)40 = 50(20) = \$1000$

$TS_{closed} = CS_{closed} + PS_{closed} = 800 + 1000 = 1800$

b. (2 points) Suppose that you are told that the world price of a watch is $20. If Piedmont opens this market to trade, then we can see through our analysis that there was actually a deadweight loss (DWL) when this market was closed to trade. Given this information and holding everything else constant, calculate the DWL that occurs when the market is closed to trade. Show your work.
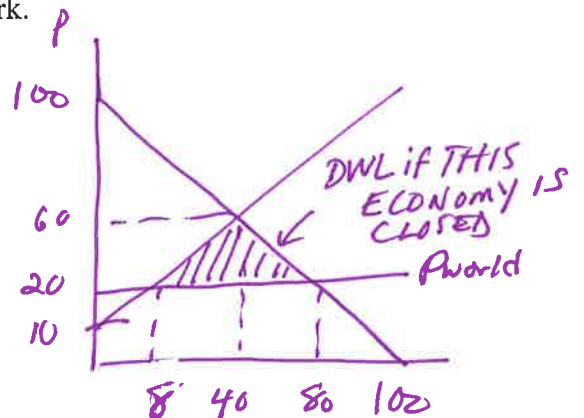
DWLclosed = _____ $1440 _____

$DWL_{closed} = \frac{1}{2}bh$
$= \frac{1}{2}(60 - 20)(80 - 8)$
$= \frac{1}{2}(40)(72)$
$= 20(72) = 1440$

DWL if THIS ECONOMY IS CLOSED

P_{world}

20

c. (5 points) Suppose that you are told that the world price of a watch is $20. Suppose Piedmont opens this market to trade while at the same time implementing an import quota of 27 units. Calculate the following values and show how you got your answers.
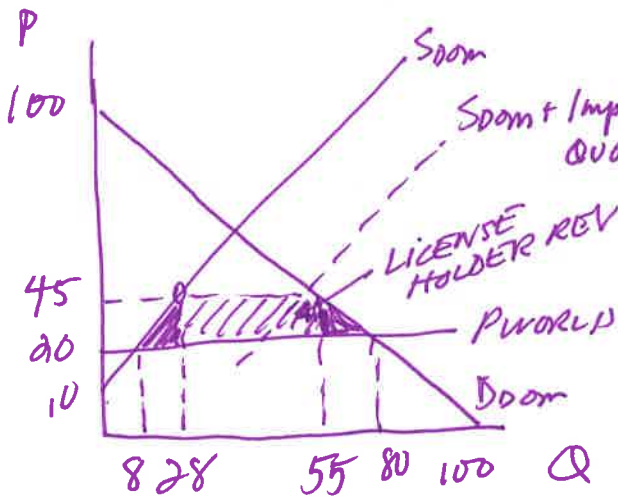
Price with the import quota = __$45 / WATCH__

Quantity demanded domestically with the import quota of 27 units = __55 WATCHES__

Quantity supplied domestically with the import quota of 27 units = __28 WATCHES__

License Holder Revenue with the import quota of 27 units = __$675__

DWL with the import quota of 27 units = __$937.50__

$$Q^S_{Dom} + Import\ Quota = Q^D_{Dom}$$

$$P = 10 + (5/4)(Q^S_{Dom})$$

$$\left(\tfrac{5}{4}\right) Q^S_{Dom} = P - 10$$

$$Q^S_{Dom} = \tfrac{4}{5}P - 8$$

$$Q^D_{Dom} = 100 - P$$

$$\left(\tfrac{4}{5}\right)P - 8 + 27 = 100 - P$$

$$\left(\tfrac{4}{5}\right)P + 19 = 100 - P$$

$$\tfrac{9}{5}P = 81$$

$$P = 81\left[\tfrac{5}{9}\right] = 45$$

$$\begin{array}{r} 27 \\ \underline{25} \\ 135 \\ \underline{54} \\ 675 \end{array}$$

$$Q^D_{Dom} = 100 - 45 = 55\ WATCHES$$

$$Q^S_{Dom} = \tfrac{4}{5}[45] - 8 = 36 - 8 = 28\ WATCHES$$

LICENSE HOLDER REV = $(45-20)(55-28) = (25)(27) = \$675$

$$DWL = \tfrac{1}{2}(45-20)(28-8) + \tfrac{1}{2}(45-20)(80-25)$$

$$DWL = \tfrac{1}{2}(25)(20) + \tfrac{1}{2}(25)(55)$$

$$DWL = 250 + \tfrac{1375}{2} = 250 + 687.5 = \$937.50$$

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3. (Worth a total of 10 points) Suppose you are given the following information about production in Jamestown where only watches and bracelets are produced:

	Price in 2015	Quantity in 2015	Price in 2016	Quantity in 2016
Watches	X =	10 watches	Y =	20 watches
Bracelets	$20	Z =	$15 per bracelet	10 bracelets

You are also provided the following information about Jamestown:

Year	Nominal GDP	Real GDP with Base Year 2015	GDP deflator
2015	$500	$500	V =
2016	$450	$400	W =

Use this provided information to calculate the missing values for V, W, X, Y and Z. Explain your work and clearly show how you found your answers. THERE WILL BE NO CREDIT GIVEN FOR ANY NUMERIC ANSWER PROVIDED WITHOUT SUPPORTING EXPLANATION. Record your final answers in the following blanks, but show your work below this recording place.

(2 points): V = __100__
(2 points): W = __112.5__
(2 points): X = __$10/watch__
(2 points): Y = __$15/watch__
(2 points): Z = __20 BRACELETS__

$$Nom\ GDP_{2016} = 20Y + 15(10)$$
$$450 = 20Y + 150$$
$$300 = 20Y$$
$$Y = \$15/WATCH$$

$$V = \frac{Nom\ GDP_{2015}}{REAL GDP_{2015}} \cdot (100) = \frac{500}{500}(100) = 100$$

$$W = \frac{Nom\ GDP_{2016}}{REAL GDP_{2016}} (100) = \frac{450}{400}(100) = 112.5$$

$$Nom\ GDP_{2015} = 10X + 20Z$$
$$500 = 10X + 20Z$$
$$500 = 10(10) + 20Z$$
$$400 = 20Z$$
$$Z = 20$$

$$REAL\ GDP_{2016} = 20X + 20(10)$$
$$w/ BY\ 2015$$
$$400 = 20X + 200$$
$$200 = 20X$$
$$X = 10$$

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Extra Workspace: Do Not Remove the Staple!