Economics 102
Summer 2014
First Midterm
7/3/14

Name _ANNOTATED ANSWER 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)

1. In recent years the unemployment rate in the United States has
a. Overstated the level of unemployment due to the exclusion of discouraged workers and marginally attached workers in its computation of the unemployment rate.
(b.) Been lower than it would otherwise have been if the number of discouraged workers had been counted as unemployed workers. ✓ U-3 officially reported unemployment rate does not include discouraged workers

2. Suppose that tastes and preferences for a good increase while at the same time there is an increase in the number of producers in this industry. Holding everything else constant, you conclude that
(a.) The equilibrium price of this good is indeterminate.
b. The equilibrium quantity of this good is indeterminate.

[handwritten supply-demand diagram with S_1, S_2, D_1, D_2, P_1, Q_1, and notation "P?, Q↑"]
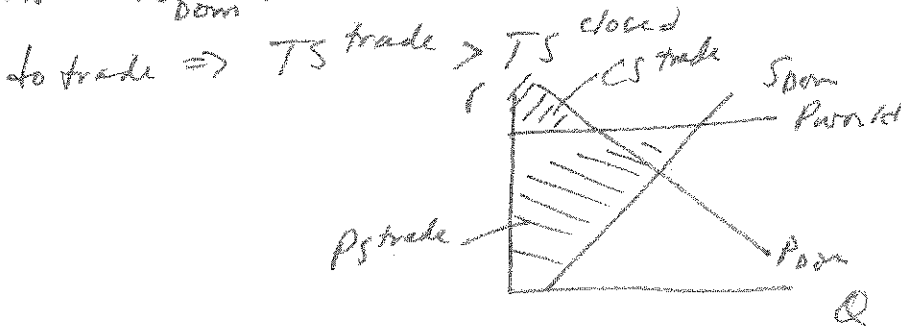
3. Suppose that a small, closed economy opens its markets to trade and in every market assume that the world price is different from the closed economy price. Given this information we know with certainty that
a. Domestic consumers will benefit from this decision.
(b.) Total surplus in this closed economy will increase if this country opens its markets to trade.

[handwritten notes and diagrams]

If $P_W > P_{e_{Dom}}$ then PS increases when economy opens to trade ⇒ TS trade > TS closed

[supply-demand diagram labeled CS trade, S_{Dom}, P_{world}, P_{Dom}, PS trade]

If $P_W < P_{e_{Dom}}$ then CS increases when economy opens to trade ⇒ TS trade > TS closed
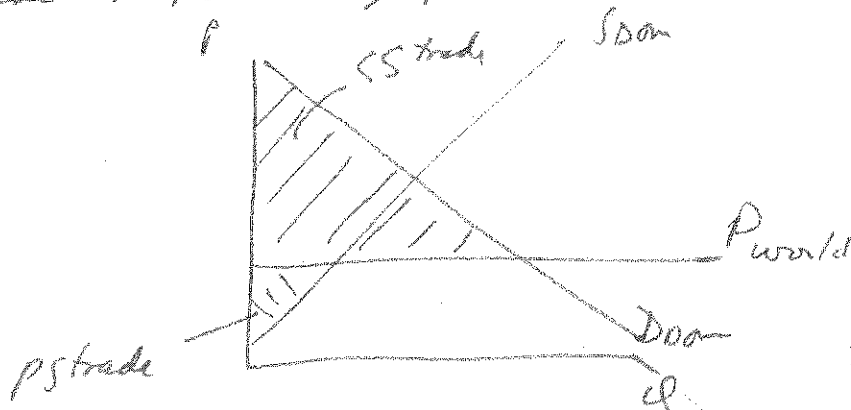
[supply-demand diagram labeled CS trade, S_{Dom}, P_{world}, D_{Dom}, PS trade]

2

4. Susie purchases a home from its owner in 2014 for $500,000. This house was built in 1975. In addition, Susie purchased 100 shares of stock from her stockbroker for $10,000 in 2014. She paid her stockbroker a commission of 10% of the value of the stock transaction. Finally, Susie sold her 2007 Jetta and replaced it with a 2013 Nissan. She sold the Jetta herself for $3,000 and the cost of the Nissan was $12,000. Given this information which of the following statements is true?

a. The only item in this list that counts as part of GDP in 2014 is the $1000 that Susie pays as a commission to her stockbroker.

b. The items in this list that count as part of GDP in 2014 are the commission to the stockbroker and the money Susie earns when she sells her Jetta.

5. Use the following graph to answer this question. The graph shows a joint PPF for Bob and Jane who both produce apples and oranges.
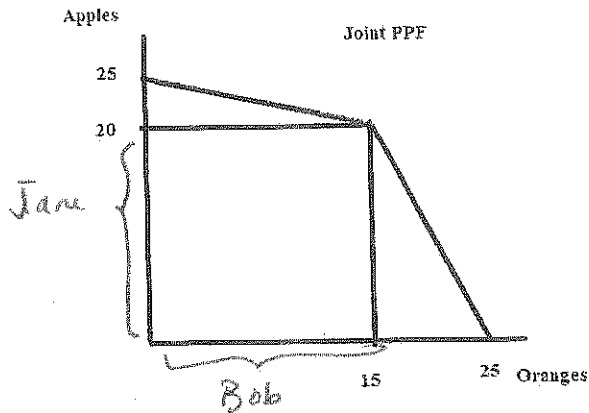
Suppose you are told that Bob has the comparative advantage in producing oranges. Given this information, what is Bob's opportunity cost of producing 1 apple?

a. Bob's opportunity cost of producing one apple is 1/3 orange.

b. Bob's opportunity cost of producing one apple is 3 oranges.
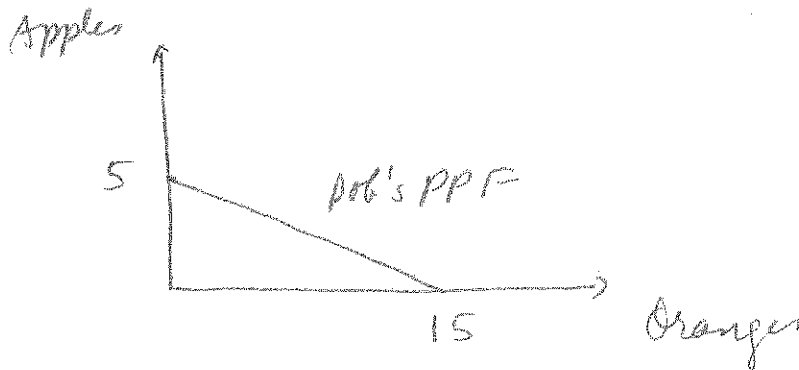
3

Equation for PPF b/w A & B:

$$\boxed{B = 100 - W}$$

Equation for PPF b/w B & C:

$$B = b - 2W$$
$$80 = b - 2(20)$$
$$80 = b - 40$$
$$120 = b$$
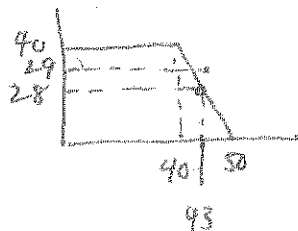$$\boxed{B = 120 - 2W}$$

Equation for PPF b/w C & D:

$$B = b - 4W$$
$$0 = b - 4(50)$$
$$200 = b$$
$$\boxed{B = 200 - 4W}$$

7. (a) If $W = 43$ then

$$B = 200 - 4W$$
$$B = 200 - 4(43)$$
$$B = 200 - 172 = 28 \text{ and not } 29.$$

so, (43 watches, 29 bananas) is beyond the PPF : not feasible

b) If $W = 4$ then $B = 100 - W$
$$B = 100 - 4 = 96$$ so, (4 watches, 96 bananas) is feasible, inefficient since inside the PPF

c) if $W = 24$ then $B = 120 - 2W$
$$B = 120 - 2(24)$$
$$B = 120 - 48 = 72$$
so, (24 watches, 72 bananas) feasible & efficient since this pt. is on PPF

d) if $W = 38$ then $B = 120 - 2W$
$$B = 120 - 2(38)$$
$$B = 120 - 76 = 44$$
so (38 watches, 44 bananas) is feasible & efficient

Use the following information to answer the next **three** questions.

The graph below illustrates the PPF for Arcadia, a small economy that produces bananas and watches. Between each designated point in this graph assume that the PPF for Arcadia is linear: for example, between points A and B in this graph the PPF is linear, between points B and C in this graph the PPF is linear but may have a different slope than the slope between points A and B, etc.
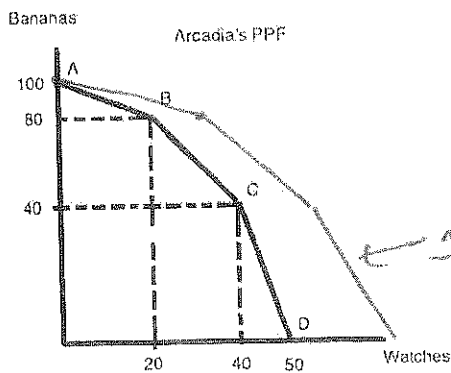
6. If Arcadia is currently producing at point B, what is the opportunity cost of producing one more unit of bananas?
a. 20 watches
b. 40 watches
c. 2 watches
d. 1 watch

Slope b/w pts A & B = $-\frac{20}{20}$ = -1
O.C. of 1 B is therefore 1 watch

7. Given Arcadia's PPF which of the following points is **not** feasible for Arcadia?
a. (43 watches, 29 units of bananas)
b. (4 watches, 94 units of bananas)
c. (24 watches, 72 units of bananas)
d. (38 watches, 44 units of bananas)

8. Suppose that the technology for producing watches improves in Arcadia while the technology for producing bananas is unchanged. Which of the following statements is true given this change in technology and holding everything else constant?
a. Arcadia's PPF will now be further from the origin relative to every point on its initial PPF.
b. Arcadia's PPF will pivot out from the origin with Point A on the initial PPF the pivot point for the new PPF.
c. Arcadia's PPF will pivot out from the origin with Point D on the initial PPF the pivot point for the new PPF.
d. Arcadia's PPF will remain in the same position as it is in initially since there has been no change in the level of resources.

Peter

OC of 1H is ½ S

OC of 1S is 2H

Paul

OC of 1H is ¼ S

OC of 1S is 4H

Mary

OC of 1H is 1S

OC of 1S is 1H

Paul: Compad with Hammers   Mary: compad with Songs

Song

Peter, Paul & Mary all Songs

35

Paul all Hammers /
Peter & Mary all Songs

Paul   30

Peter

Paul & Peter all Hammers /
Mary all Songs

20

Mary

Peter, Paul & Mary all Hammers

-¼

-½

-1

Paul   20   Peter   40   Mary   60   Hammers

1 Song

Paul's Perspective

Peter's Perspective

1H   2H   4H

Mary's Perspective
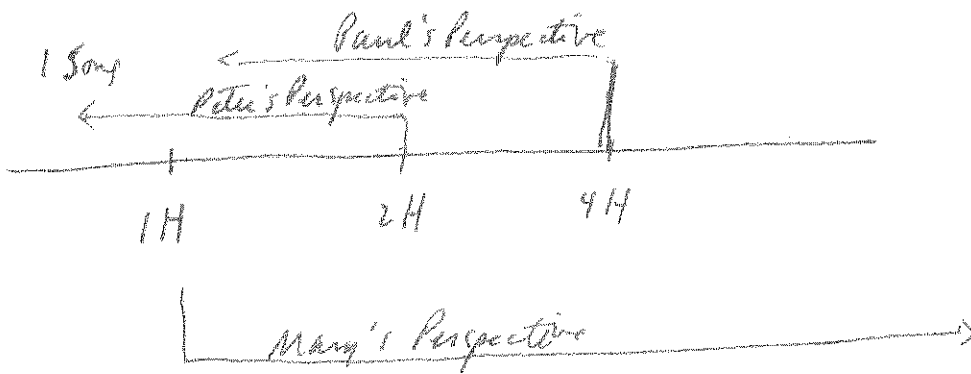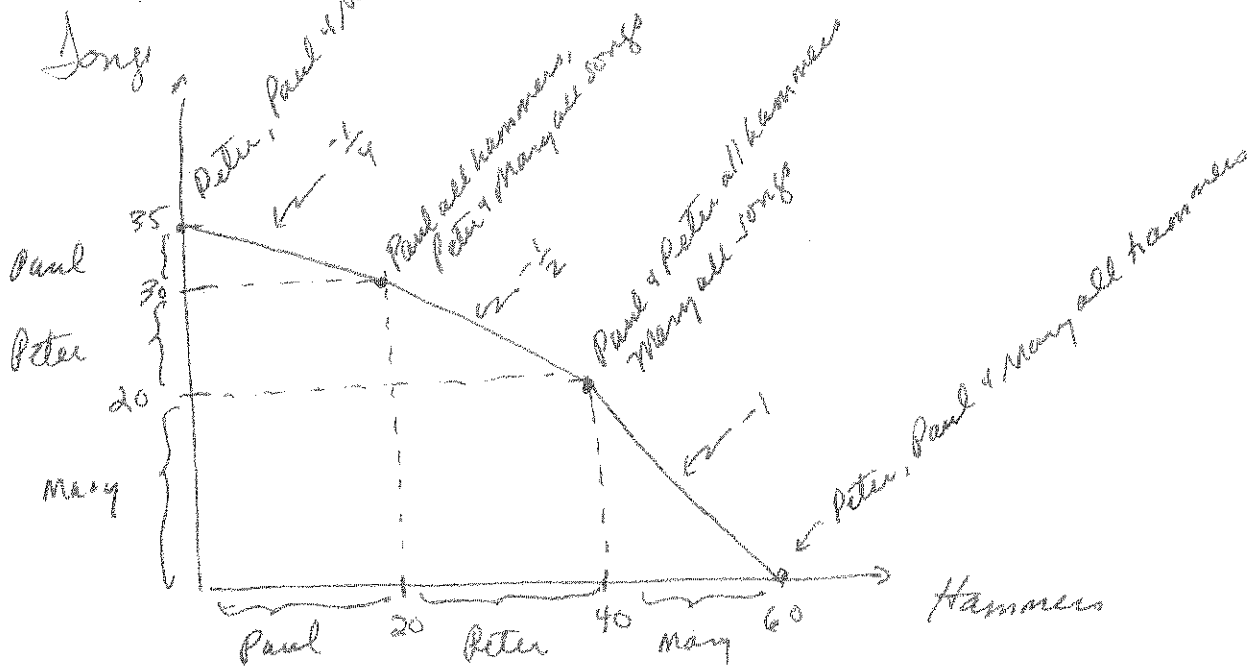
Use the following information to answer the next <u>three</u> questions.

Below you are provided the three linear PPFs for Peter, Paul and Mary who produce songs and hammers.
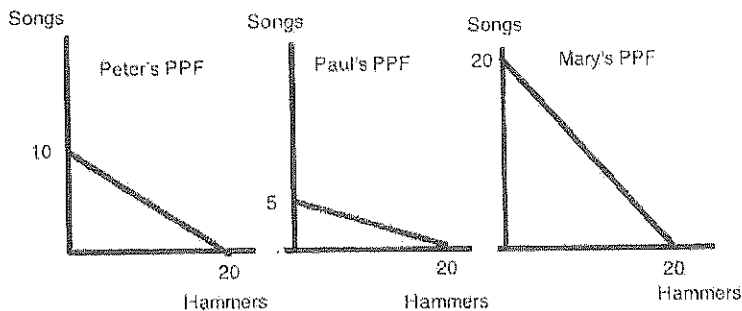
9. Given the above PPFs, which of the following statements is true?
a. Paul has the comparative advantage in the production of hammers and Peter has the comparative advantage in the production of songs.
b. Paul has the comparative advantage in the production of hammers and Mary has the comparative advantage in the production of songs.
c. Paul has the comparative advantage in the production of songs and Mary has the comparative advantage in the production of hammers.
d. Paul has the comparative advantage in the production of songs and Peter has the comparative advantage in the production of hammers.

10. Given the above PPFs, which of the following statements is true? If you construct the joint PPF for these three individuals,
a. One of the kink points occurs at a production of 30 songs and 20 hammers: at this point, Paul will specialize in producing hammers while Mary and Peter will specialize in producing songs.
b. One of the kink points occurs at a production of 20 songs and 40 hammers: at this point, Paul and Mary will specialize in producing hammers while Peter will specialize in producing songs.
c. One of the kink points occurs at a production of 25 songs and 25 hammers: at this point, Peter will specialize in producing hammers while Mary and Paul will specialize in producing songs.
d. One of the kink points occurs at a production of 20 songs and 20 hammers: at this point, Peter and Paul will specialize in producing hammers while Mary specializes in producing songs.

11. Given the above PPFs, we can conclude that the trading range of prices for 1 song in terms of hammers will
a. Be equal to and greater than 1 hammer for Mary.
b. Be equal to and less than 2 hammers for Peter.
c. Be equal to and less than 4 hammers for Paul.
d. Answers (a), (b) and (c) are all correct answers.

12. Economist Jane and Economist Bob are having a heated argument about the correct *(value judgment / subjective)* economic policy given today's economic issues. Jane argues for a policy to stimulate the level of spending in the economy in order to bring the level of unemployment down *(Jane's goal: reduce unemployment)* while Bob argues for the implementation of contractionary monetary policy in order to reduce the inflation rate. Jane argues that the most important goal for the economy should be the restoration of the "right" level of unemployment while Bob argues that the most *(Bob's goal: reduce inflation rate)* important goal for the economy is insuring the "right" level of inflation. Given this information we can conclude that

a. Jane's position is a normative one while Bob's position is a positive one.
b. Jane's position is a normative one and Bob's position is a normative one.
c. Jane's position is a positive one and Bob's position is a positive one.
d. Jane's position is a positive one while Bob's position is a normative one.

13. Consider the market for bananas. Suppose this market is initially in equilibrium and then a huge tropical storm blows through the banana producing region and uproots/destroys 50% of the banana trees. At the same time that this storm hits a study appears in a prestigious medical journal stating the health benefits of banana consumption. Given this information and holding everything else constant, which of the following statements is true? Relative to the initial equilibrium,

a. The equilibrium price of bananas will increase while the equilibrium quantity of bananas will decrease.
b. The equilibrium price of bananas will decrease while the equilibrium quantity of bananas will increase.
c. The equilibrium price of bananas may increase, decrease or remain the same while the equilibrium quantity of bananas will increase.
d. The equilibrium price of bananas will increase while the equilibrium quantity of bananas may increase, decrease, or remain the same.
e. The equilibrium price of bananas will decrease while the equilibrium quantity of bananas may increase, decrease, or remain the same.
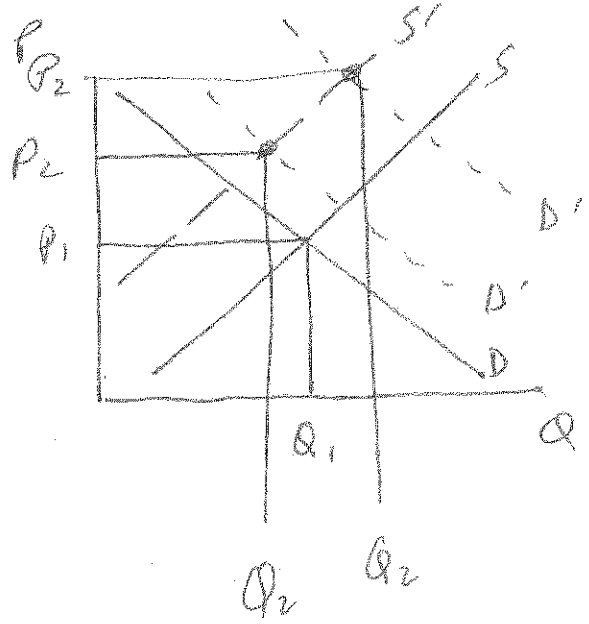
$P\uparrow$, Q? relative to P_1 & Q_1

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

Usario is a bread production company that produces wheat bread. In producing wheat bread, Usario uses wheat grown by Brownberry Farms and flour milled by Waterwheel Productions. Both Brownberry Farms and Waterwheel Productions sell all of their product to Usario. The following table summarizes the transactions that go into the production of wheat, flour and bread during the year 2014.

	Brownberry Farms	Waterwheel Productions	Usario	
Wages	$400	$1000	$300	*Total wages = 1700*
Rent	$200	$500	$200	*Total rent = 900*
Interest	$100	$300	$500	*Total interest = 900*
Total Revenues	$1000	$3000	$5000	

14. Given the above information, what is the contribution to GDP from this transaction for the year 2014?
a. $9000
b. $8000
c. $6000
(d.) $5000

Note: Brownberry Farms and Waterwheel Productions sell all of their product to Usario. All intermediate goods.
Value of Final Product = Usario's Total Revenue

15. Given the above information, what is the value of ~~profits earned by Usario?~~ *total profits?*
a. $4000
b. $3000
(c.) $1500
d. $1000

if GDP = $5000 then
GDP = wages + interest + rent + profits
5000 = 1700 + 900 + 900 + profits
1500 = profits

16. Consider a market in which there are ten consumers of the good. Each of these consumers have the identical demand curve and this demand curve can be expressed as the following equation where P is the price per unit and q is the number of units demanded by the individual:

Individual Demand Curve: q = 5 – (1/2)P

$\frac{1}{2}P = 5 - q$
$P = 10 - 2q$

Given this information, what is the equation for the market demand curve? In the following answers Q is the market quantity and P is the market price.
a. Q = 50 – (1/2)P
b. Q = 50 – 10P
c. Q = 55 – (1/2)P
(d.) Q = 50 – 5P
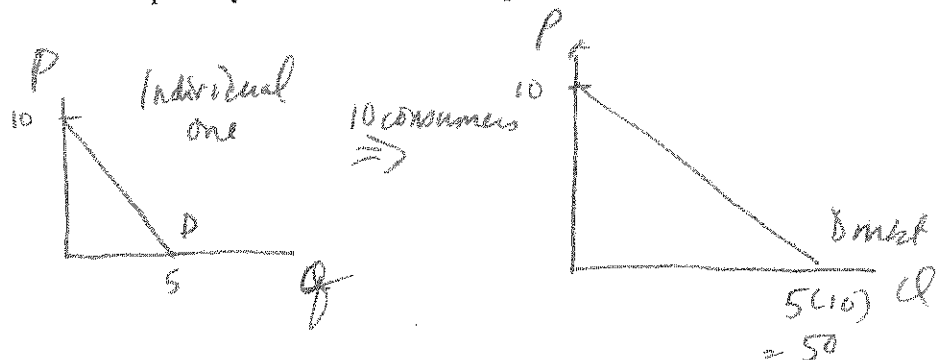
P = 10 - $\frac{1}{5}$Q
$\frac{1}{5}$Q = 10 - P
Q = 50 - 5P

9

17. Consider a market in which there are five firms that produce the good. Each of these firms are identical and their individual supply curves for the product can be expressed as the following equation where P is the price per unit and q is the number of units supplied by the firm:

        Individual Supply Curve: P = 5q − 10

Given this information, what is the equation for the market supply curve? In the following answers Q is the market quantity and P is the market price.

(a) Q = P + 10
b. Q = (1/5)P + 10
c. Q = 2P + 10
d. Q = (1/5)P + 50

Handwritten: $5q = P + 10$ $q = \frac{1}{5}P + 2$ $q_1 + q_2 + q_3 + q_4 + q_5 = Q_{TOTAL}$

$Q_{TOTAL} = 5(\frac{1}{5}P + 2)$

$Q_{TOTAL} = P + 10$

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

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

        Domestic Demand: Q = 400 − 2P   *(hw:* $2P = 400 - Q$ or $P = 200 - \frac{1}{2}Q$ *)*
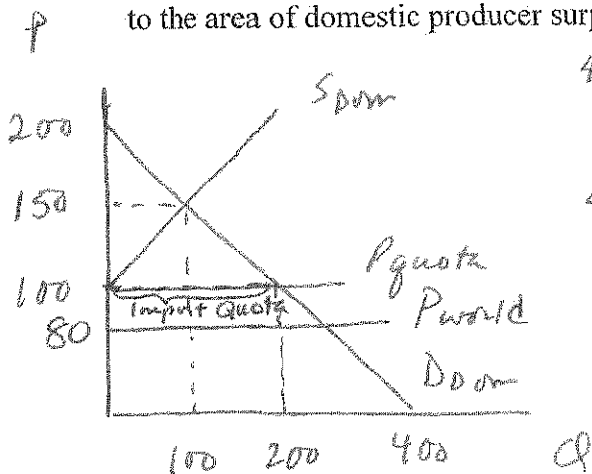   Domestic Supply: Q = 2P − 200   *(hw:* $2P = Q + 200$ or $P = \frac{1}{2}Q + 100$ *)*

The current world price for yo-yos is $80.

18. Given the above information which of the following statements is true?
a. Domestic suppliers are in favor of opening this market to trade while domestic consumers are against opening this market to trade. ✗
b. If this market opens to trade domestic producer surplus will be larger than it was when the market was closed to trade. ✗   *(hw: no PS will ↓ w/ trade)*
(c) If this market opens to trade there will be no domestic producer surplus. ✓
d. If this market opens to trade there will be a deadweight loss. ✗

19. Suppose this market opens to trade while at the same time Midville implements an import quota of 200 yo-yos. Given this information and holding everything else constant, which of the following statements is true?
(a) This policy will result in a reduction of the area of domestic consumer surplus relative to the area of domestic consumer surplus if trade is allowed. ✓
b. This policy will help domestic consumers of yo-yos. ✗
c. This policy will help domestic producers of yo-yos. ✗
d. This policy will result in an increase in the area of domestic producer surplus relative to the area of domestic producer surplus if trade is allowed. ✗

Handwritten graph and work:

P axis with values 200, 150, 100, 80; curves labeled S dom, P quota, P world, D dom; Q axis with 100, 200, 400; "Import Quota"

$400 - 2P = 2P - 200$
$600 = 4P$
$P = 150$ in closed mkt

$400 - 2(150) = Q_e$ in closed mkt
$100 = Q_e$ in closed mkt

Import Quota
$Q^S + Quota = Q^D$
$2P - 200 + 200 = 400 - 2P$
$4P = 400$
$P = 100$

10

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

Circleville has a population of 4,000 people. 10% of these people are less than sixteen years old. Of those at least sixteen years old, 800 are not in the labor force. The rest of the population is in the labor force. Of the people in the labor force, 1000 people are employed full-time, 600 people are employed part-time but wish to be employed full-time, and 500 people are employed part-time and are satisfied with their jobs. The rest of the labor force population is not employed. Of the people who are not in the labor force but who are at least 16 years old 200 people are discouraged workers.

20. Given the above information, the unemployment rate in Circleville is approximately
a. 32%
b. 28%
c. 22%
d. 30%
e. 25%

21. Suppose that Circleville decides to include discouraged workers as unemployed workers when calculating the unemployment rate. If Circleville makes this change, the unemployment rate given the above information will be approximately
a. 25%
b. 40%
c. 30%
d. 26%
e. 42%

20.

4000 population
-400   10% of pop <16
─────
3600   16 n older pop.
-800   not in LF ⟶ 200 discouraged workers
─────
2800   in LF

⟶ 1000 full time employed
   600 part-time but want full-time
   500 part-time & satisfied
─────
   2100 Employed

   2800 LF
  -2100 Employed
  ─────
   700 Unemployed

Unemployment rate $= \left[\dfrac{\text{unemployed}}{LF}\right](100\%)$

$= \left(\dfrac{700}{2800}\right)(100\%)$

$= \left(\dfrac{1}{4}\right)(100\%) = 25\%$

Unemployment rate w/ discouraged workers $= \left[\dfrac{700+200}{2800+200}\right](100\%)$

$= \left(\dfrac{900}{3000}\right)(100\%)$

$= 30\%$

11

22. Suppose that you know that good X is a normal good. Suppose the market for good X is initially in equilibrium when two events occur: 1) there is an increase in income for the consumers of good X and 2) there is a devastating freeze that destroys 20% of this year's production of good X. Given this information

a. We know with certainty that the equilibrium price of good X increases and the equilibrium quantity of good X increases

(b.) We know with certainty that the equilibrium price of good X increases but we cannot know with certainty what happens to the equilibrium quantity of good X.

c. We know with certainty that the equilibrium quantity of good X increases but we cannot know with certainty what happens to the equilibrium price of good X.

d. We know with certainty that the equilibrium quantity of good decreases but we cannot know with certainty what happens to the equilibrium price of good X.

23. Marcy is currently taking Chem 100 at her University. She knows that her grade will be based on her performance on three midterms and a final. The midterms will all receive equal weight in her final grade calculation and each midterm will carry a weight of 20% of her final grade. The final exam will account for 40% of her final grade. She is a bit confused about what grade she needs to make on the final exam to earn an A given that her scores on the three midterms were as follows:

Score on Midterm One: 36 out of a possible 40 points $\Rightarrow 36 \times 2.5 = 90$ on 100 pt scale

Score on Midterm Two: 45 out of a possible 50 points $\Rightarrow 45 \times 2 = 90$ on 100 pt scale

Score on Midterm Three: 23 out of a possible 25 points $\Rightarrow 23 \times 4 = 92$ on 100 pt scale

The final has a total of 50 possible points and she knows that her average on the four exams must be at least a 90 in order for her to get an A in the class. What score on the final exam is the minimum she must score in order to get that A? $\hookrightarrow$ on a 100-point scale

a. Marcy needs to make a score above 89 on her final exam.

(b.) Marcy needs to make a score above 44.5 on her final exam.

c. Marcy needs to make a score above 48 on her final exam.

d. Marcy needs to make a score above 40.5 on her final exam.
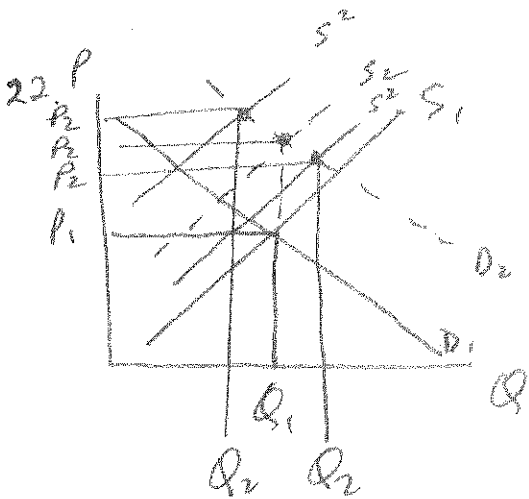
$P \uparrow$ relative to P_1

Q ? relative to Q_1

23.

$90 = .2(\text{Midterm }1) + .2(\text{Midterm }2)$
$\qquad + .2(\text{Midterm }3) + .4(\text{Final})$

all exams on 100 point scale

$90 = .2(90) + .2(90) + .2(92) + .4(\text{Final})$
$90 = 18 + 18 + 18.4 + .4(\text{Final})$
$90 = 54.4 + .4(\text{Final})$
$.4F = 35.6$

Final on 100 point scale $= 89$

But, Final on 50 point scale so $\frac{89}{100} = \frac{x}{50}$

$100x = 50 \cdot 89$
$x = 44.5$

$\begin{array}{r} 89 \\ .4\overline{)35.6} \\ \underline{32} \\ 36 \end{array}$

24. Suppose Nancy puts $100 in a savings account at the beginning of the year. The bank promises to pay Nancy 10% on this account for the first year and 15% on this account for the second year. Nancy does not plan to remove the $100 or the interest she earns from this deposit until after she receives her interest payment in the second year. At the time when she removes these funds, how much will she have in this account?

a. $125.00
b. $126.50
c. $111.50
d. $225.00

$(100)(1.1) = \$110$ first year

$(110)(1.15) = 126.50$ second year

$$\begin{array}{r} 1.15 \\ 110 \\ \hline 1150 \\ 11500 \\ \hline 126.50 \end{array}$$

25. Consider the market for taxis in Madison. Currently this market is described by the following market demand and supply equations where P is the price per ride and Q is the number of taxis:

Market Demand Curve: Q = 10,000 – 1000P
Market Supply Curve: Q = 5,000

Two new ride sharing programs have in recent months tried to enter the Madison taxi market. If the these ride sharing programs are successfully implemented in Madison it is estimated that the number of rides will increase by 500 rides when the price is $2 per ride and by 1000 rides when the price is $4 per ride. For this problem you can assume that the supply curve for the rides provided by the ride sharing operations is linear and includes these two points that have been described. Given this information, which of the following statements is true? (Hint: more than one answer may be right.)

a. Prior to the entry of these two new ride sharing programs the equilibrium price of a taxi ride is $5.00 in Madison. ✓

b. With the entry of these two new ride sharing programs into this market the equilibrium price of a taxi ride in Madison will fall to $4 per ride and the total number of rides will equal 6,000. ✓

c. Consumer surplus in this market will increase by $5500 if these two ride sharing programs enter the Madison market. ✓

d. Answers (a), (b) and (c) are all true statements.

e. Answers (a) and (b) are true statements.

Sₙ/new companies

↑ in CS

5000 ; 10,000
6000

5000 ; 6000
5500
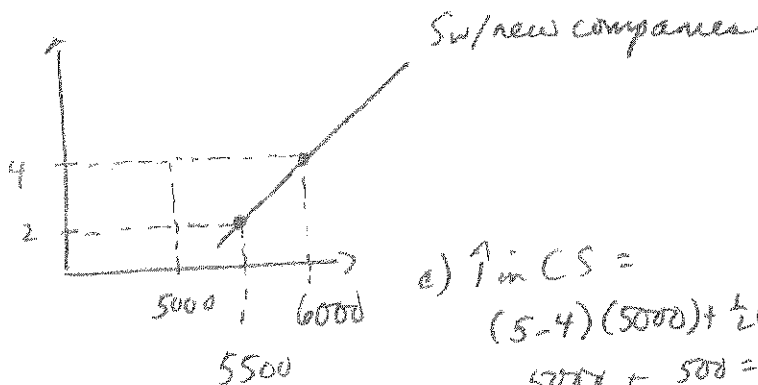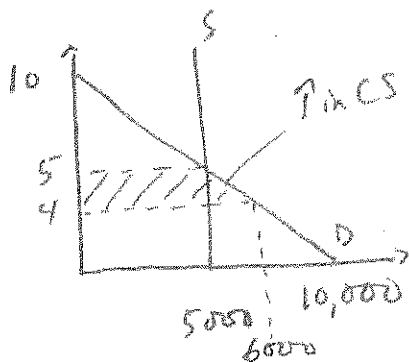
c) ↑ in CS =
$(5-4)(5000) + \frac{1}{2}(5-4)(1000)$
$5000 + 500 = \$5500$

25 a) $10,000 - 1000P = 5000$
$5000 = 1000P$
$P = \$5$

b) if P = 4 what is Q^D?
$Q^D = 10,000 - 1000(4) = 6000$
if P = 4 what is Q^S? ⇒ see graph to right ⇒ at P = 4, Q^S = 6000

13

1. (Worth a total of 10 points) Suppose Bob and Helen each have 24 hours a week that they can work producing windows and doors. Furthermore, suppose that both Bob and Helen have linear production possibility frontiers (PPFs) and that they can produce fractional amounts of both goods. The table below provides information about the amount of labor time that Bob and Helen need to produce one window or one door.

	Number of Hours of Labor Needed to Produce One Window	Number of Hours of Labor Needed to Produce One Door
Bob	2 Hours	4 Hours
Helen	3 Hours	3 Hours

a. (1 point) In the space below draw 2 graphs. In the first graph draw Bob's PPF for a week and in the second graph draw Helen's PPF for a week. In the graphs measure windows (W) on the horizontal axis and doors (D) on the vertical axis. Label both graphs clearly and completely for full credit.
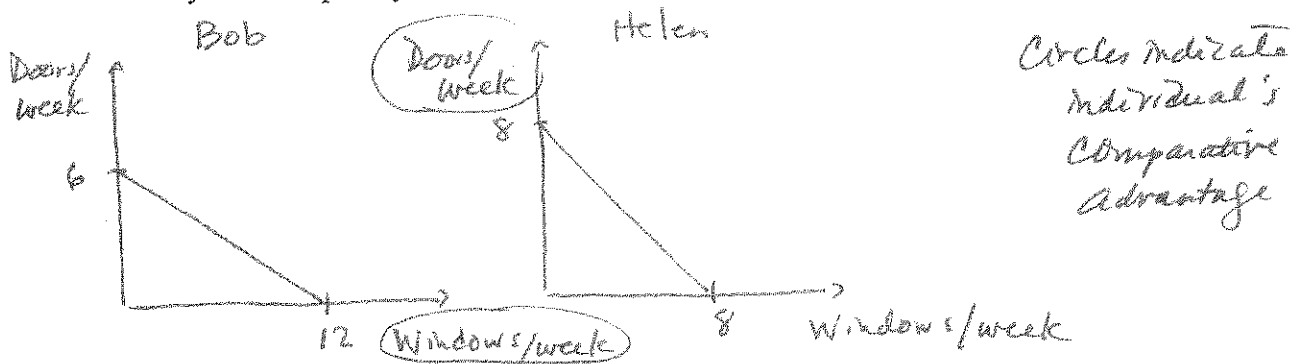
b. (1 point) Determine who has comparative advantage in the production of windows and explain how you got your answer.
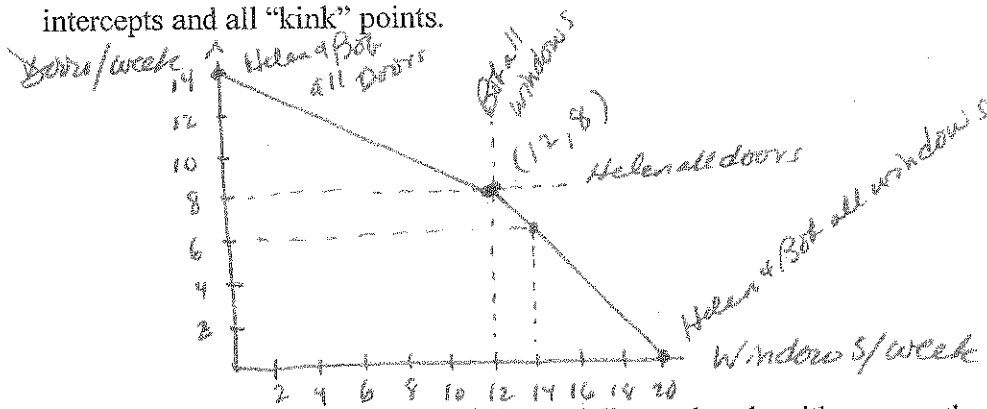
Bob: OC of 1W is ½D
OC of 1D is 2W
Helen: OC of 1W is 1D
OC of 1D is 1W

Bob has comparative advantage in the production of windows since his O.C. of producing 1W is less than Helen's O.C. of producing one W (½D vs 1D)

c. (1 point) Determine who has comparative advantage in the production of doors and explain how you got your answer.

Helen has comp adv. in the production of doors since her O.C. of producing 1D is less than Bob's O.C. of producing 1D (1W vs 2W)

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d. (2 points) In the space below draw the joint PPF for Helen and Bob measuring windows on the horizontal axis and doors on the vertical axis. Provide coordinates for all intercepts and all "kink" points.

Doors/week

Helen q Bob all Doors

(12,8)

Bob all windows

Helen all doors

Helen q Bob all windows

Windows/week

14 12 10 8 6 4 2

2 4 6 8 10 12 14 16 18 20

e. (2 points) Suppose Helen and Bob specialize and trade with one another. If they produce a total of 14 windows, what is the maximum number of doors they can produce? Show the work you did to find your answer for full credit.

If $W = 14$ then $D = ?$

Lower segment of joint PPF:

$$D = b - W$$
$$8 = b - 12$$
$$b = 20$$

so $D = 20 - W$

and if $W = 14$ then $D = 6$

f. (1 point) Given parts (d) and (e), determine how many doors and windows are produced by Bob and Helen. Provide your answer by completing the following table.

	Windows	Doors
Bob	12	0
Helen	2	6
Total	14	6

g. (2 points) In the space below depict the acceptable range of trading prices for 4 doors in terms of windows if Bob and Helen trade with one another. In your depiction (use the number line approach illustrated in class) provide arrows indicating Bob and Helen's perspectives on this trading range.

1 D ← Bob's Perspective

1 W   2 W

Helen's Perspective →

or

4 D ← Bob's perspective

4 W   8 W

Helen's Perspective →

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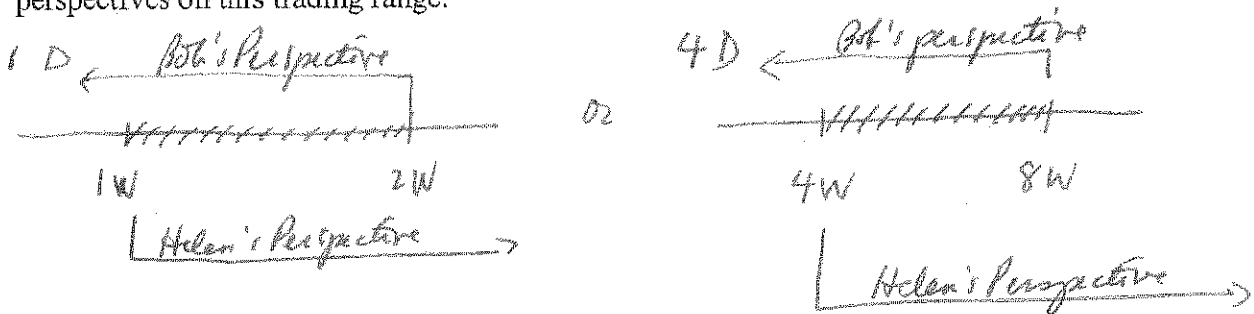
2. (Worth a total of 10 points) Suppose the small, closed economy of Tibia's market for bananas can be described by the following domestic demand and domestic supply equations where P is the price of a unit of bananas and Q is the number of units of bananas:

Domestic Demand: $Q = 40 - 2P$ or $2P = 40 - Q \Rightarrow P = 20 - \frac{1}{2}Q$

Domestic Supply: $Q = 2P - 4$ or $2P = Q + 4 \Rightarrow P = \frac{1}{2}Q + 2$

a. (1 point) In the space below, calculate the equilibrium price of a unit of bananas and the equilibrium quantity in Tibia is this market is closed.

Closed mkt: $40 - 2P = 2P - 4$

$44 = 4P$

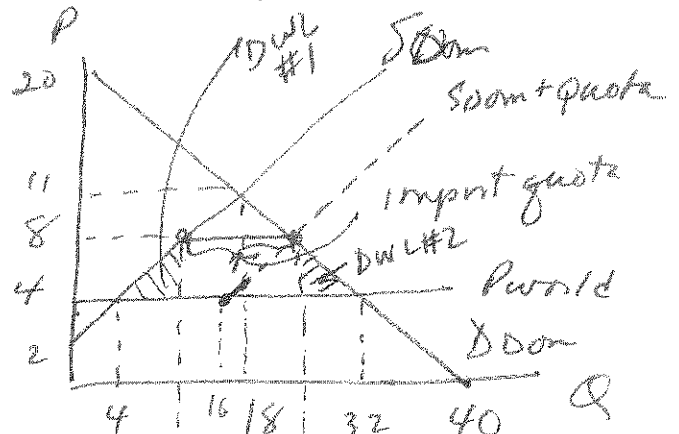$P_e = 11$

$Q_e = 40 - 2(11) = 18$

$Q_e = 2(11) - 4 = 18$
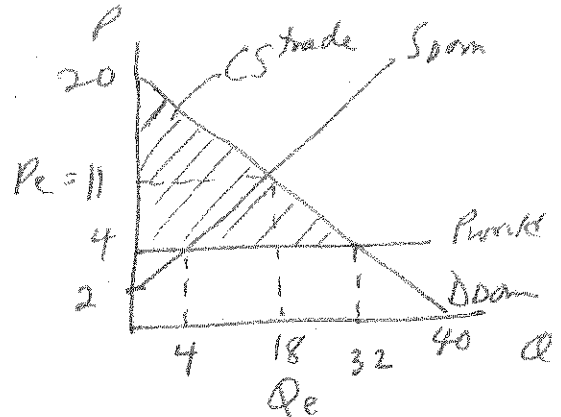
b. (1 point) Suppose the banana market in Tibia opens to trade and that the world price of bananas is $4 per unit of bananas. Calculate the value of domestic consumer surplus in this market when it opens to trade. Show your work for full credit.

When $P = 4 \Rightarrow Q^D_{dom} = 40 - 2(4) = 32$

$\Rightarrow Q^S_{dom} = 2(4) - 4 = 4$

$CS_{trade} = \frac{1}{2}(\$20/unit - \$4/unit)(32\ units)$

$= (\$8/unit)(32\ units)$

$= \$256$

c. (2 points) Suppose this market is open to trade and the world price of bananas is $4 per unit of bananas. If the government of Tibia imposes an import quota of 12 units of bananas, what will be the price of a unit of bananas in Tibia? Show your work for full credit.

$Q^S_{dom} + Quota = Q^D_{dom}$

$(2P - 4) + 12 = 40 - 2P$

$2P + 8 = 40 - 2P$

$4P = 32$

$P = \$8/unit\ of\ bananas$

or $S\ w/quota:\ P = \frac{1}{2}Q + 8$

we know $(16, 4)$ are on new curve

So: $4 = \frac{1}{2}(16) + b \Rightarrow b = -4$

$S\ w/quota:\ P = \frac{1}{2}Q - 4$ solve:

$D:\ P = 20 - \frac{1}{2}Q$ $\frac{1}{2}Q - 4 = 20 - \frac{1}{2}Q$

$Q = 24 \Rightarrow Q^S_{dom} = Q = 24 \Rightarrow$ implies $P = \$8$

d. (1 point) Given the information in (c), what is the deadweight loss due to moving production away from the lower cost foreign producer to the higher cost domestic producer? Show our work for full credit.

DWL cost due to using higher cost domestic producer = $\frac{1}{2}$ ($8/unit – $4/unit)(12 units – 4 units)

(see area DWL #1)

DWL #1 = ($2/unit)(8 units) = $16

e. (1 point) Given the information in (c), what is the total value of deadweight loss due to the imposition of this import quota? Show your work for full credit.

Total DWL = DWL #1 + DWL #2

= $16 + $\frac{1}{2}$ ($8/unit – $4/unit)(32 units – 24 units)

= $16 + ($2/unit)(8 units) = $32

f. (2 points) Provide a brief statement explaining why trade is beneficial. In your answer use complete sentences (with a subject and a verb, punctuation, etc.-that is, use standard, grammatical English).

Trade ↑ TS: (see provided answer key – but just here is that the combined areas of CS + PS are increased when a market is open to trade.

g. (2 points) Provide a brief statement explaining why economists argue that trade has distributional consequences. In your answer use complete sentences (with a subject and a verb, punctuation, etc.-that is, use standard, grammatical English).

When markets open to trade Total Surplus increases but there are distributional consequences. If $P_W < P_{edom}$ then PS ↓ when the market opens to trade while CS ↑: domestic consumers will favor trade with this scenario. If $P_W > P_{edom}$ then CS ↓ when the market opens to trade while PS ↑: domestic producers will favor trade with this scenario. 17

3. (Worth a total of 10 points) Suppose you are given the following information about production in Smallville:

	Price in 2013	Quantity in 2013	Price in 2014	Quantity in 2014
Containers of Hummus	$2.00 per container	100 containers	$2.00 per container	50 containers
Packages of Pita Bread	$5.00 per package	20 packages	$4.00 per package	25 packages

a. (1 point) In the space below provide a general formula for calculating nominal GDP. This formula should not reference specific goods but should instead provide a formula that someone could use in calculating nominal GDP.

$$\text{Nominal GDP} = \sum_{i=1}^{n} P_i^{CY} Q_i^{CY} \quad \text{where}$$

$$CY = \text{current year}$$

b. (2 points) In the space below calculate nominal GDP for 2013 and nominal GDP for 2014 from the provided data. Once you have calculated your answers and shown your work, put your answer in the provided table.

Year	Nominal GDP
2013	$300
2014	$200

$$\text{nom GDP } 2013 = 2(100) + 5(20) = 200 + 100 = 300$$

$$\text{nom GDP } 2014 = 2(50) + 4(25) = 100 + 100 = 200$$

c. (1 point) Write a general formula for calculating real GDP. This is a general formula and not one specific to this data set.

$$\text{Real GDP} = \sum_{i=1}^{n} P_i^{BY} Q_i^{CY}$$

$$\text{where}$$

$$BY = \text{base year}$$

$$CY = \text{current year}$$

d. (2 points) Calculate real GDP for Smallville based upon the given data using 2014 as the base year. Show all your work in finding this answer and then summarize your answer in the provided table.

Year	Real GDP with 2014 base year
2013	$280
2014	$200

Real GDP 2014 w/ BY 2014 = Nom GDP 2014 = $200

Real GDP 2013 w/ BY 2013 = 2(100) + 4(20) = 200 + 80 = 280

e. (2 points) Calculate the GDP deflator for 2013 and for 2014 given the work you have done in parts (a) through (d). Calculate the GDP deflator based on a **200 point scale and using 2014 as your base year**! Make sure you show any formula that you use and all your work in finding your answer. You may round to the NEAREST WHOLE NUMBER IN YOUR ANSWER!

$$GDP \text{ deflator } 2013 \text{ w/ } BY \text{ } 2014 = \left[\frac{nom \ GDP_{2013}}{real \ GDP_{2013}}\right](scale) = \frac{300}{280}(200) = 214 \quad \boxed{GDP \text{ deflator} \atop 214}$$

$$GDP \text{ deflator } 2014 \text{ w/ } BY \text{ } 2014 = \left[\frac{nom \ GDP_{2014}}{real \ GDP_{2014}}\right](scale) = \frac{200}{200}(200) = 200$$

f. (2 points) Between 2013 and 2014 what is happening to the level of production in this economy? What is happening to the level of prices in this economy during this time period based upon the GDP deflator? Use complete sentences in your answer.

Real GDP is ↓ from 2013 to 2014 so this tells us production in this economy is falling during this period of time.
GDP deflator is ↓ from 2013 to 2014 so w/ BY 2014 this tells us prices are falling. Falling by $\left(\frac{200-214}{214}\right)(100\%)$ or $\left(\frac{-14}{214}\right)(100\%)$ during this time period.

$$\frac{30(200)}{28} , \frac{3 \cdot 10 (2 \cdot 100)}{4,7} = \frac{1500}{7}$$
$$\frac{214}{7)\overline{1500}}$$

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