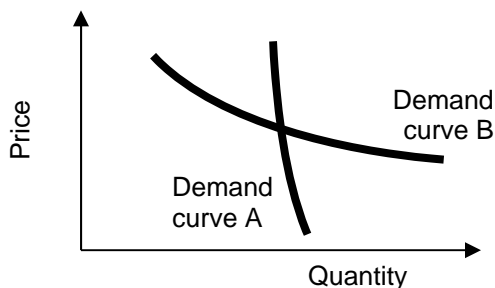


**EXAMINATION 2 VERSION A**  
**"Applications of Supply and Demand"**  
**October 14, 2015**

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 100.

**I. Multiple choice:** Please circle the one best answer to each question. [1 pt each, 7 pts total]

- (1) Which demand curve below is *less* elastic?
- Demand curve A.
  - Demand curve B.
  - Both have the same elasticity because they pass through the same point.
  - Cannot be determined from information given.



- (2) Assuming that orange juice and grapefruit juice are substitutes, then the cross-price elasticity of demand for grapefruit juice with respect to the price of orange juice must be
- positive
  - negative.
  - zero.
  - cannot be determined from information given.

- (3) Suppose the price of pumpkins in Des Moines is \$3 and the cost of shipping pumpkins between Des Moines and Kansas City is \$1 per pumpkin. Markets are *out of equilibrium* if the price of pumpkins in Kansas City is
- \$1.75 per pumpkin.
  - \$2.25 per pumpkin.
  - \$3.25 per pumpkin.
  - \$3.75 per pumpkin.
  - All of the above.

- (4) Suppose the price of a share of stock in BigCorp today is \$50. Assume that speculators are already active in the stock market, and that the market is in *equilibrium*. Then speculators must believe that the price of a share of stock in BigCorp tomorrow will be
- less than \$50.
  - about \$50.
  - greater than \$50.
  - cannot be determined from information given.

- (5) Suppose a change in government policy increases the welfare of government employees by \$5 billion but decreases the welfare of taxpayers by \$4 billion. Such a change would be called a
- Pareto improvement.
  - a potential Pareto improvement, or an economically efficient change.
  - both of the above.
  - none of the above.

- (6) A quota on *buyers* of tropical fish would have basically the same effect on the market for tropical fish as
- a price ceiling on tropical fish.
  - a price floor on tropical fish.
  - a tax on tropical fish.
  - a subsidy for tropical fish.
  - a free market for tropical fish.

- (7) Suppose the price elasticity of demand for baby food is -0.2 and the price elasticity of supply is 5.0. If a subsidy is given for baby food,
- Producers will enjoy most of the subsidy.
  - Consumers will enjoy most of the subsidy.
  - Producers and consumers will each enjoy half of the subsidy.
  - Answer depends on which side receives the check from the government.

**II. Problems:** Insert your answer to each question in the box provided. Use margins and graphs for scratch work. Only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Calculating elasticities: 2 pts] Suppose that if the price of admission to an amusement park is \$10, attendance is 7 thousand per day. If the price is \$15, attendance is 3 thousand per day. Compute the price elasticity of demand for the amusement park using the “arc-elasticity” formula.

|  |
|--|
|  |
|--|

(2) [Using price elasticity of demand: 10 pts] Suppose the government’s target is to reduce cigarette consumption by 15 percent and suppose the price elasticity of demand for cigarettes is -0.3. Assume everything affecting demand for cigarettes except price remains constant.

- a. According to the information above, is demand for cigarettes *elastic*, *inelastic*, or *unitary-elastic*?
- b. To achieve the government’s target, must cigarette prices *increase*, *decrease*, or remain *constant*?
- c. ... by approximately how much?
- d. Will the total amount that smokers spend on cigarettes *increase*, *decrease*, or remain *constant*?
- e. ... by approximately how much?

|   |
|---|
|   |
|   |
| % |
|   |
| % |

(3) [Using income elasticities: 10 pts] Suppose the income elasticity of demand for health care is 0.4. Now suppose consumer income *rises* by 5%. Assume the price of health care does not change.

- a. According to the information above, is health care a *necessary good*, an *inferior good*, or a *luxury (or superior) good*?
- b. As income rises, will the quantity of health care demanded *increase*, *decrease*, or remain *constant*?
- c. ... by about how much?
- d. Will consumer spending on health care, as a fraction of a consumer’s total budget, *increase*, *decrease*, or remain *constant*?
- e. ... by about how much?

|   |
|---|
|   |
|   |
| % |
|   |
| % |

(4) [Effects of international trade: 14 pts] Country X and Country Y both have markets for petroleum. Supply and demand schedules for the two countries are given below.

| Price | Country X         |                   | Country Y         |                   |
|-------|-------------------|-------------------|-------------------|-------------------|
|       | Quantity demanded | Quantity supplied | Quantity demanded | Quantity supplied |
| \$10  | 19                | 5                 | 9                 | 5                 |
| \$20  | 18                | 6                 | 8                 | 8                 |
| \$30  | 17                | 7                 | 7                 | 11                |
| \$40  | 16                | 8                 | 6                 | 14                |
| \$50  | 15                | 9                 | 5                 | 17                |
| \$60  | 14                | 10                | 4                 | 20                |
| \$70  | 13                | 11                | 3                 | 23                |
| \$80  | 12                | 12                | 2                 | 26                |
| \$90  | 11                | 13                | 1                 | 29                |

First consider the outcomes under autarky (that is, no international trade).

- a. Find the equilibrium price in Country X.
- b. Find the equilibrium price in Country Y.

|    |  |
|----|--|
| \$ |  |
| \$ |  |

Now consider the outcomes under free international trade between Country X and Country Y.

- c. Compute the equilibrium price with free international trade.
- d. Which country exports petroleum?
- e. How much petroleum does that country export?

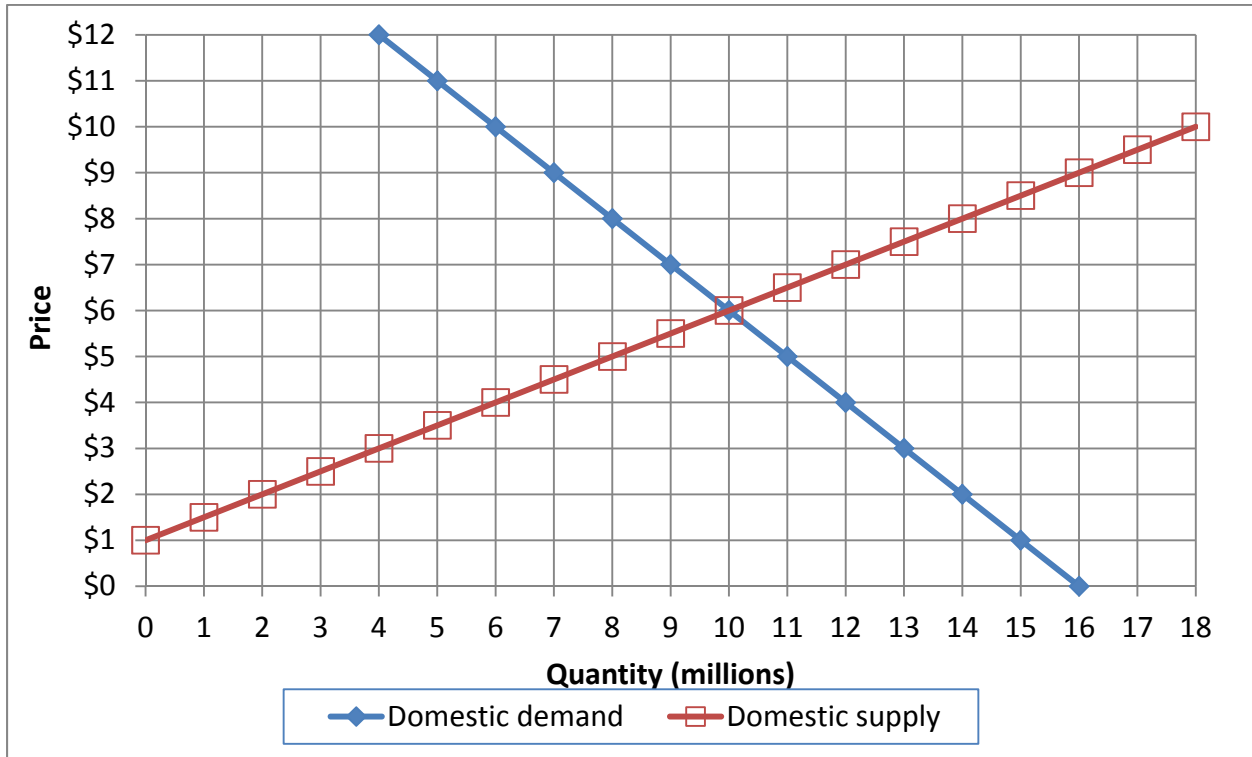
|    |  |
|----|--|
| \$ |  |
|    |  |
|    |  |

Indicate whether each of the following groups are *better off*, *worse off*, or *just as well off as before*, as a result of free international trade.

- f. [1 pt] Petroleum consumers in Country X.
- g. [1 pt] Petroleum producers in Country X.
- h. [1 pt] Petroleum consumers in Country Y.
- i. [1 pt] Petroleum producers in Country Y.

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |

(5) [Welfare effects of international trade: 18 pts] Domestic supply and demand for calculators in a particular country are given by the following diagram.



a. At first, international trade in calculators is not permitted. Find the equilibrium price without international trade.

|    |  |
|----|--|
| \$ |  |
|----|--|

Then this industry is opened to international trade and the international price of calculators turns out to be \$4.

b. Will this country now *export* or *import* calculators?

|  |
|--|
|  |
|--|

c. How many?

|         |
|---------|
| million |
|---------|

d. Does consumer surplus in this country *increase or decrease* from international trade in calculators?

|  |
|--|
|  |
|--|

e. By how much?

|    |         |
|----|---------|
| \$ | million |
|----|---------|

f. Does producer surplus in this country *increase or decrease* from international trade in calculators?

|  |
|--|
|  |
|--|

g. By how much?

|    |         |
|----|---------|
| \$ | million |
|----|---------|

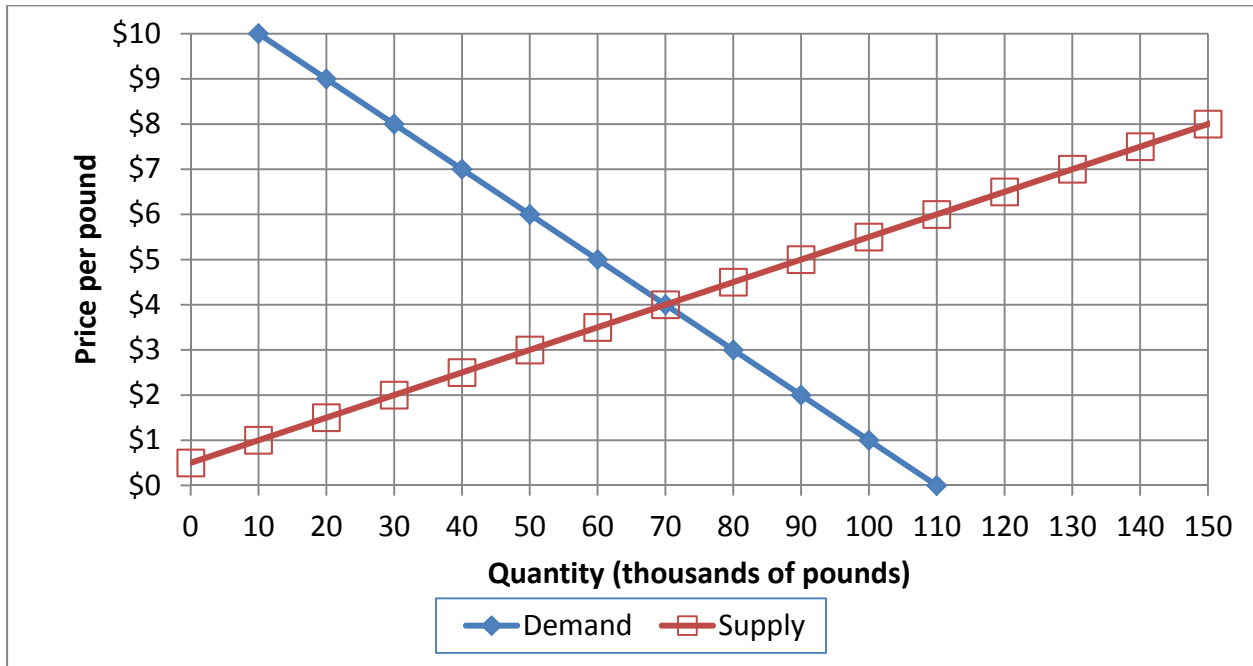
h. Does total social welfare in this country *increase or decrease* from international trade in calculators?

|  |
|--|
|  |
|--|

i. By how much?

|    |         |
|----|---------|
| \$ | million |
|----|---------|

(6) [Welfare analysis of market controls: 18 pts] The following graph shows the market for almonds.



a. Find the equilibrium price without government intervention.

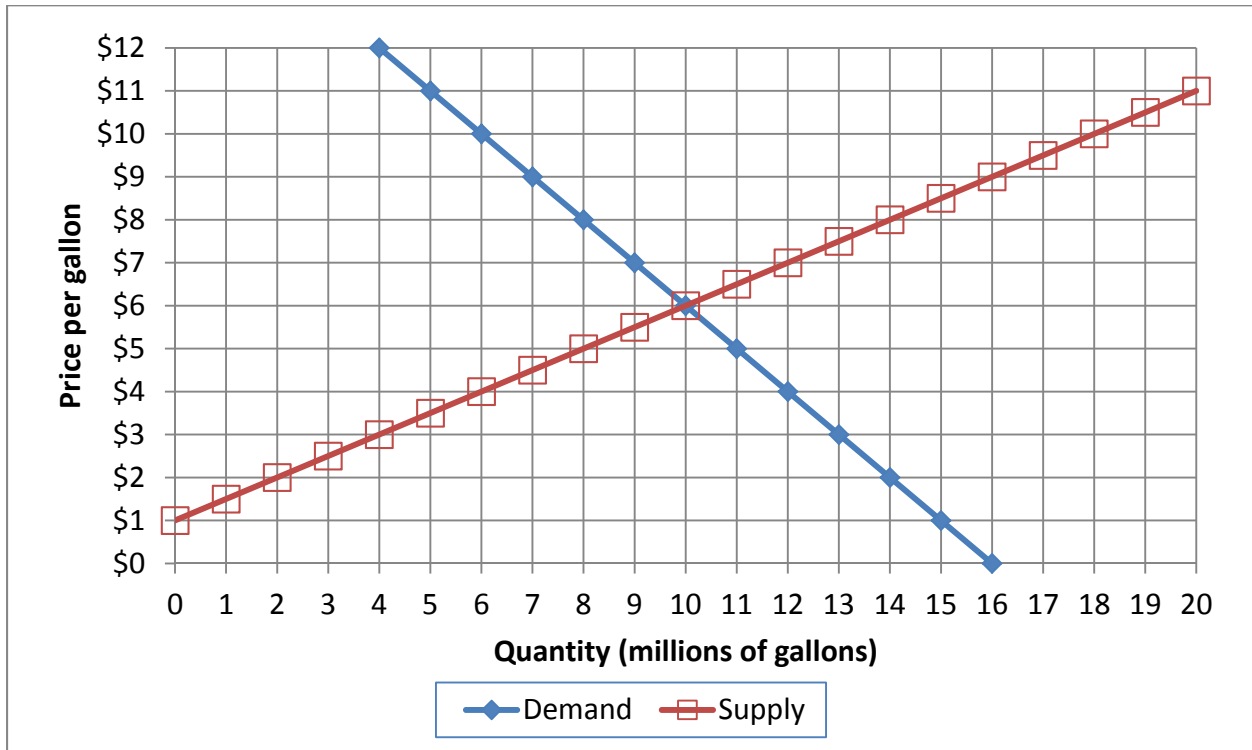
|    |           |
|----|-----------|
| \$ | per pound |
|----|-----------|

Suppose the government imposes a *quota on sellers*. No more than 30 thousand pounds of almonds may be sold. Quota rights or permits to sell 30 thousand pounds of almonds are distributed to sellers for free, but no one may sell almonds without a permit.

- b. Would this quota on sellers cause the price of almonds to *increase*, *decrease*, or *remain constant* ?
- c. Compute the new equilibrium price of almonds with the quota system on sellers.
- d. Does producer surplus *increase*, *decrease*, or *remain constant* because of the quota system, as compared to the market without government intervention? (Assume optimistically that quota rights to sell almonds are given to those almonds producers with the lowest cost.)
- e. By how much?
- f. Does consumer surplus *increase*, *decrease*, or *remain constant* because of the quota system, as compared to the market without government intervention?
- g. By how much?
- h. If the government sold the quota rights or permits at auction, what would be the equilibrium **price of a permit** to sell one pound of almonds?
- i. Compute the deadweight social loss caused by the quota system.

|    |            |
|----|------------|
|    |            |
| \$ | per pound  |
|    |            |
| \$ | thousand   |
|    |            |
| \$ | thousand   |
| \$ | per permit |
| \$ | thousand   |

(7) [Welfare analysis of tax or subsidy: 18 pts] The graph below shows the market for bottled water.



Suppose the government imposes an excise **tax of \$3** per gallon.

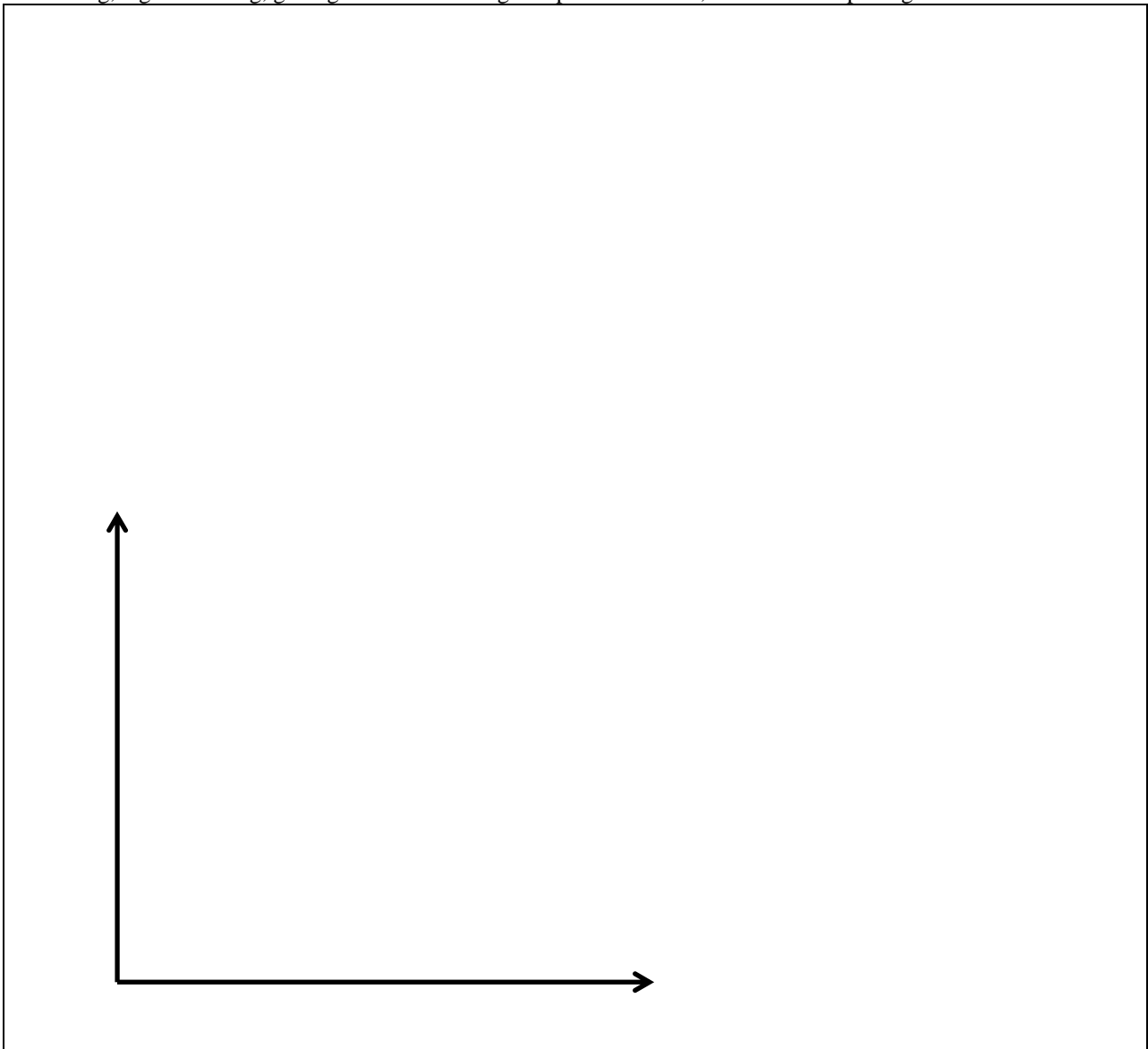
- Compute the equilibrium quantity sold.
- Compute the equilibrium net price received by sellers (excluding the tax).
- Compute the equilibrium total price paid by buyers (including the tax).
- Does producer surplus *increase, decrease, or remain constant* because of the tax?
- By how much?
- Does consumer surplus *increase, decrease, or remain constant* because of the tax?
- By how much?
- Compute the total tax revenue collected by the government.
- Compute the deadweight social loss caused by the tax.

|    |                 |
|----|-----------------|
|    | million gallons |
| \$ | per gallon      |
| \$ | per gallon      |
| \$ | million         |
| \$ | million         |
| \$ | million         |
| \$ | million         |

**III. Critical thinking:** Write a one-paragraph essay answering *one* question below (your choice). [3 pts]

- (1) Assume that you want to increase your company's revenue. A company statistician estimates that demand for your main product has a price elasticity of  $-1.5$ . Marketing Consultant A argues that you should raise the price of your product. "Your customers are willing to pay more, so this is clearly the right way to boost revenue," says Consultant A. Marketing Consultant B argues that you should cut the price. "The best way to boost revenue is to build market share," says Consultant B. Who is right? What will you do? Why? (Ignore the graph.)
- (2) Consider the following statement. "American trade policy should put American workers and American businesses first. Imports should be banned if they are priced lower than the same products made by Americans." Do you agree or disagree? Who will win and who will lose from this proposal? Justify your answer with a supply-and-demand diagram, using the concepts of consumer and producer surplus.

Please circle the question you are answering. Write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.



[end of exam]