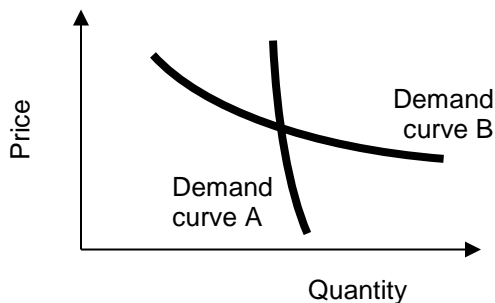


**EXAMINATION 2 VERSION B**  
**"Applications of Supply and Demand"**  
**October 12, 2016**

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, 16 pts total]

- (1) The units of measure for the price elasticity of demand for electricity are
- kilowatt-hours per dollar.
  - dollars per kilowatt-hour.
  - The elasticity is a pure number and has no units of measure.
  - percent.
- (2) 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.

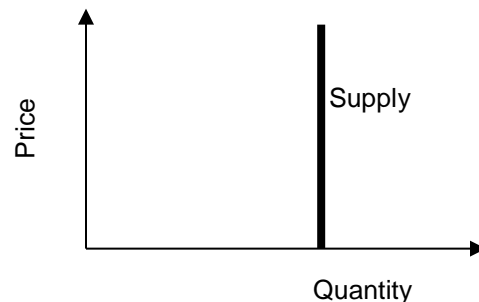


- (3) Compare the price elasticity of demand for gasoline when consumers are given just one week to adjust to a new price, with the elasticity of demand when given five years to adjust to the new price. Which is surely *smaller* (in absolute value)?
- The elasticity given one week to adjust.
  - The elasticity given five years to adjust.
  - The elasticities must be equal because they refer to the same product.
  - Cannot be determined from information given.

- (4) Assuming that hotel rooms and air travel are complements, then the cross-price elasticity of demand for hotel rooms with respect to the price of air travel must be
- positive
  - negative.
  - zero.
  - cannot be determined from information given.

- (5) Some estimates show that rich people spend a *greater fraction* of their income on new automobiles than poor people do. If this is true, then the income elasticity of demand for new automobiles must be
- negative.
  - exactly zero.
  - between zero and one.
  - exactly one.
  - greater than one.

- (6) The supply curve in the graph below is
- perfectly elastic.
  - perfectly inelastic.
  - unitary elastic.
  - Cannot be determined from information given.



(7) To be a *Pareto improvement*, a change in the economy must result in

- a. winners but no losers.
- b. gains to winners that exceed any losses to losers.
- c. at least some winners.
- d. cost savings for the government.
- e. a rise in wages, salaries, and other compensation.

(8) There are always winners and losers in every country as a result of international trade, but the country as a whole benefits from international trade if

- a. the world price is higher than the domestic price.
- b. the domestic price is higher than the world price.
- c. either (a) or (b).
- d. neither (a) nor (b).

(9) Arbitrageurs buy low and sell high because they want to

- a. keep markets orderly.
- b. ensure that all consumers face a fair price.
- c. make a profit.
- d. enforce the Law of One Price.
- e. All of the above.

(10) Suppose the price of gold were lower in New York than in Los Angeles, initially. Arbitrage would then *tend to*

- a. raise the price of gold in both cities.
- b. lower the price of gold in both cities.
- c. raise the price of gold in New York and lower the price in Los Angeles.
- d. raise the price of gold in Los Angeles and lower the price in New York.

(11) Suppose the price of pumpkins in Des Moines is \$4.50 and the cost of shipping a pumpkin between Des Moines and Chicago is \$1.00. Markets are *in equilibrium* if the price of pumpkins in Chicago is

- a. \$3.
- b. \$4.
- c. \$6.
- d. \$8.

(12) Arbitrage will *not* guarantee that people in St. Louis and Memphis pay similar prices for

- a. computer chips.
- b. cement blocks.
- c. gold.
- d. government or corporate bonds.

(13) If the free-market equilibrium price of gasoline is \$3, which government price control would be *binding* on the market?

- a. a price ceiling (or legal maximum price) of \$5.
- b. a price floor (or legal minimum price) of \$5.
- c. Both of the above would be binding.
- d. None of the above would be binding.

(14) A quota on *selling* alligator hide would cause the price of alligator hide to

- a. rise.
- b. fall.
- c. rise or fall, depending on the shapes of the demand and supply curves.
- d. remain constant.

(15) Suppose the price elasticity of demand for hotel rooms in a small city is -5.0 and the price elasticity of supply is 1.5. If a tax is imposed on hotel rooms in this city,

- a. Sellers (hotel operators) will pay most of the tax.
- b. Buyers (guests) will pay most of the tax.
- c. Sellers and buyers will each pay half of the tax.
- d. Answer depends on which side is legally required to remit the tax to the government.

(16) A Laffer curve shows the relationship between

- a. quota quantities and quota price.
- b. deadweight loss and tax rates.
- c. quantity and price.
- d. consumer surplus and price.
- e. tax rates and tax revenues.

**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 a movie theatre is \$14, attendance is 300 per day. If the price is \$10, attendance is 500 per day. Compute the price elasticity of demand for the movie theatre using the “arc-elasticity” formula.

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(2) [Using price elasticity of demand: 10 pts] Suppose the highway department increases the toll on a particular road by 5%. Also suppose the price elasticity of demand for travel on that road is -1.4. Assume everything else affecting demand for travel on that road remains constant.

- a. According to the information above, is demand for travel on this road *elastic*, *inelastic*, or *unitary-elastic*?
- b. As the price rises, will the number of cars on this road *increase*, *decrease*, or remain *constant*?
- c. ... by approximately how much?
- d. Will the total toll revenue received by the highway department *increase*, *decrease*, or remain *constant*?
- e. ... by approximately how much?

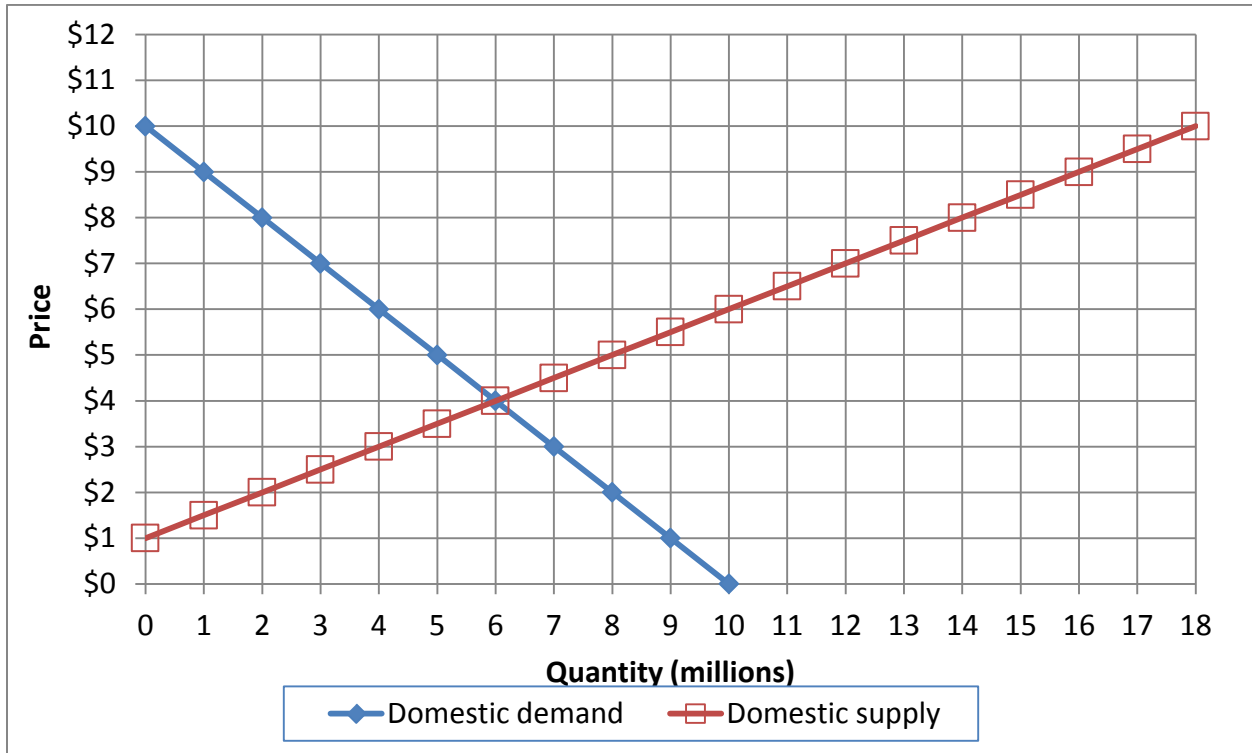
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(3) [Using income elasticities: 10 pts] Suppose the income elasticity of demand for concert tickets is 1.2. Now suppose consumer income *rises* by 5%. Assume the price of concert tickets does not change.

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

%
%

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



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

\$	
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Then this industry is opened to international trade and the international price of tee-shirts turns out to be **\$ 8**.

b. Will this country now *export* or *import* tee-shirts?

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c. How many?

million
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d. Does consumer surplus in this country *increase* or *decrease* from international trade in tee-shirts?

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e. By how much?

\$	million
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f. Does producer surplus in this country *increase* or *decrease* from international trade in tee-shirts?

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g. By how much?

\$	million
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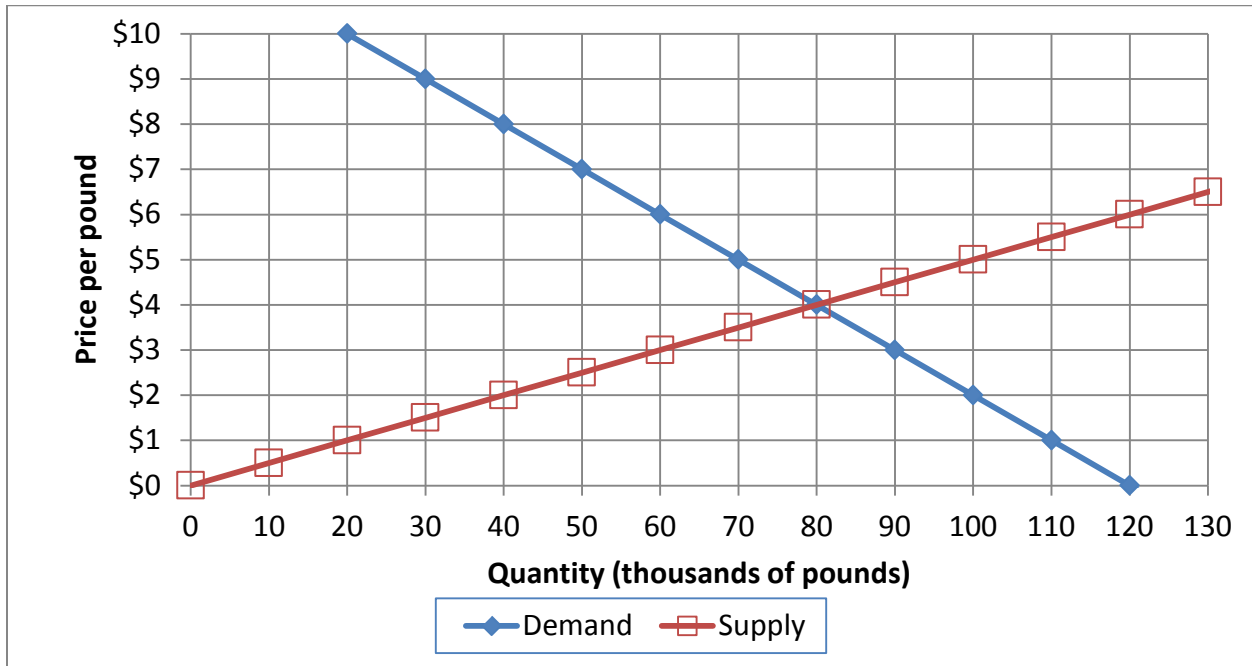
h. Does total social welfare in this country *increase* or *decrease* from international trade in tee-shirts?

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i. By how much?

\$	million
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(5) [Welfare analysis of market controls: 18 pts] The following graph shows the market for apples.



a. Find the equilibrium price without government intervention.

\$	per pound
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Suppose the government imposes a price floor (or legal minimum price) of \$ 6 per pound. No apples may be sold for a price less than the price floor.

b. How many pounds of apples will actually be sold?

thousand pounds
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c. Will there be *excess demand*, *excess supply*, or *neither*?

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d. How much?

thousand pounds
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e. Does producer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention? (Assume optimistically that apples are sold by those producers who have the lowest cost.)

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f. By how much?

\$	thousand
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g. Does consumer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention?

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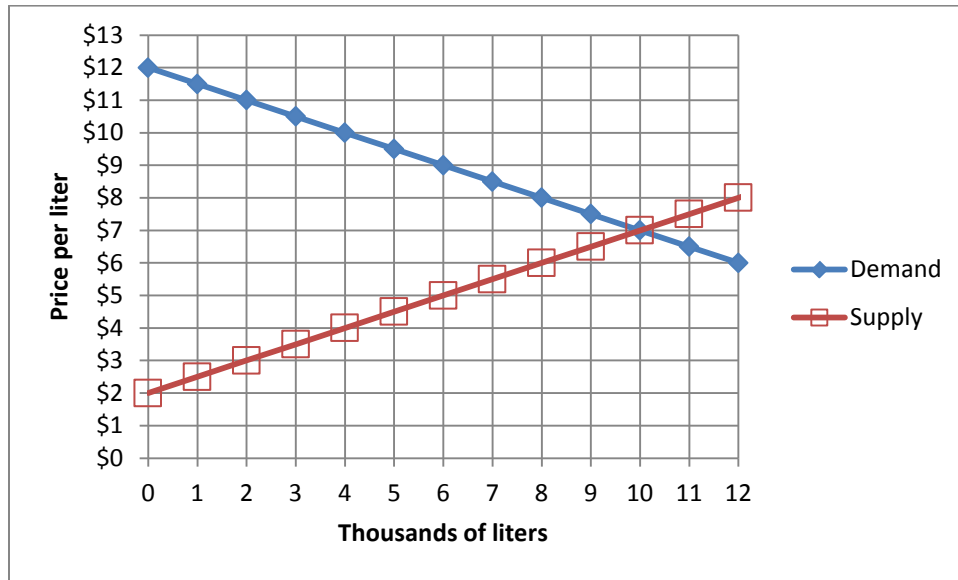
h. By how much?

\$	thousand
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i. Compute the deadweight social loss caused by the price floor.

\$	thousand
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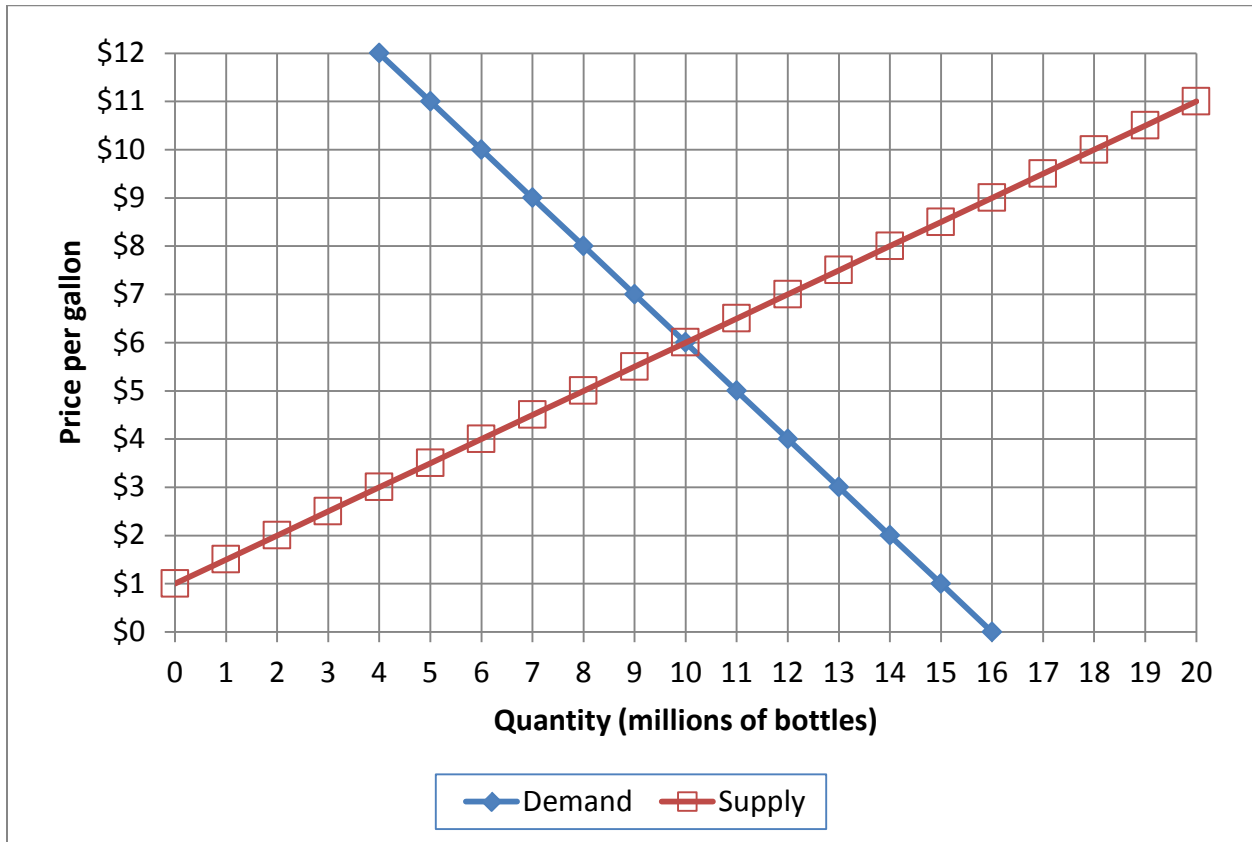
(6) [Quotas: 4 pts] Suppose the government wants to limit the use of a chemical, which is causing air pollution, by imposing a quota. The market for the chemical is shown in the graph below. Suppose the quota is imposed on chemical *producers*, who receive **8 thousand** permits to produce and sell a liter of the chemical.



- What will be the equilibrium price of the *chemical* with the quota on sellers?
- Suppose the government auctions off permits to sell the chemical. What price will *permits* likely go for?

\$		per liter
\$		per permit

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



Suppose the government provides a **subsidy of \$ 3** per bottle.

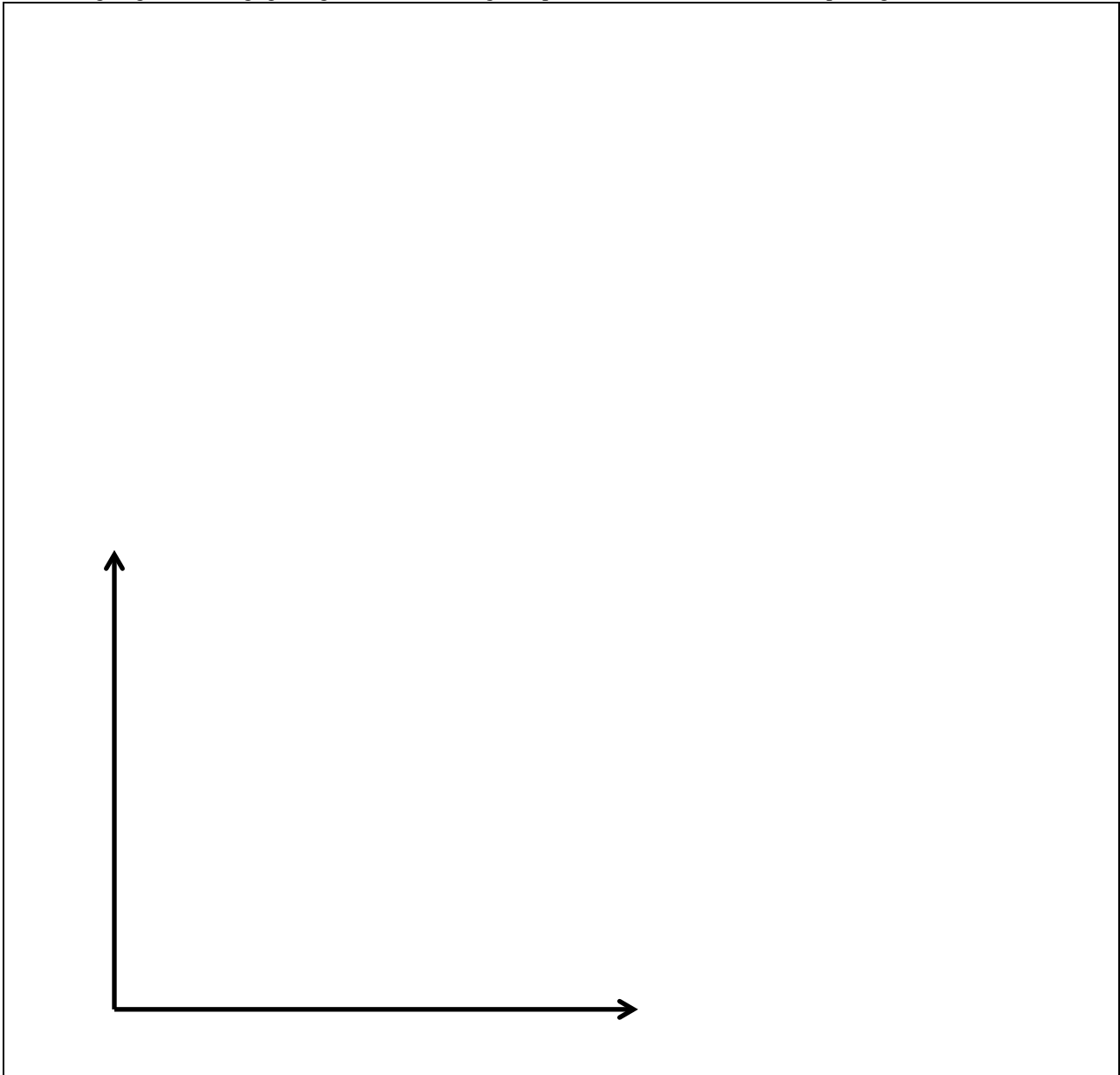
- Compute the equilibrium quantity sold.
- Compute the equilibrium total price received by sellers (including the subsidy).
- Compute the equilibrium net price paid by buyers (excluding the subsidy).
- Does producer surplus *increase, decrease, or remain constant* because of the subsidy?
- By how much?
- Does consumer surplus *increase, decrease, or remain constant* because of the subsidy?
- By how much?
- Compute the direct cost of the subsidy to the government—that is, the amount that the government will have to pay buyers and sellers.
- Compute the deadweight social loss caused by the subsidy.

	million bottles
\$	per bottle
\$	per bottle
\$	million
\$	million
\$	million
\$	million

**III. Critical thinking:** Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

- (1) The price of petroleum is currently about \$50 per barrel. A blogger says the price of petroleum will rise in the next six months to \$200 per barrel. Do speculators agree? Explain your answer. Assume the market is in equilibrium.
- (2) Suppose the government imposed maximum prices on children's vitamins. Would this action tend to increase the number of children who take vitamins? Explain why or why not, using a supply-and-demand graph of the market for children's vitamins.

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]