

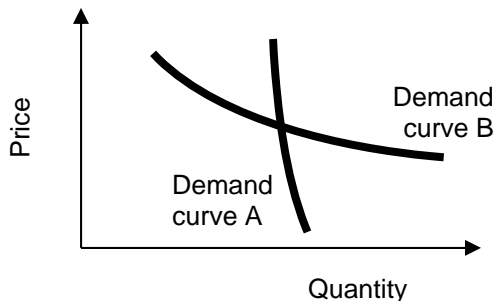
EXAMINATION 2 VERSION A
"Applications of Supply and Demand"
March 12, 2014

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 pts each, 13 pts total]

- (1) The units of measure for the price elasticity of demand for milk are
- gallons per dollar.
 - dollars per gallon.
 - percent.
 - The elasticity is a pure number and has no units of measure.

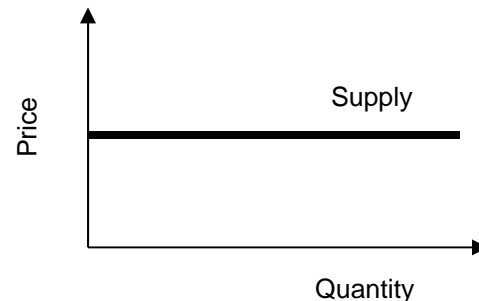
- (2) Which demand curve below is *less* elastic?
- Demand curve A.
 - Demand curve B.
 - Both have the same elasticity because they pass through the same point.
 - Cannot be determined from information given.



- (3) Initially, City A had landline (wired) telephone service but no mobile (wireless) telephone service. Later, mobile telephone service became available. As a result, the elasticity of demand for landline telephone service
- became less elastic.
 - became more elastic.
 - was unaffected because the product was unchanged.
 - Cannot be determined from information given.

- (4) 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.

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



- (6) To pass the compensation test of Kaldor and Hicks, a change in the economy must result in
- winners but no losers.
 - gains to winners that exceed any losses to losers.
 - at least some winners.
 - cost savings for the government.
 - a rise in wages, salaries, and other compensation.

(7) The price of sugar is higher in the United States than in the Caribbean. If the United States ends its restrictions on international trade in sugar, this change will benefit

- a. Caribbean sugar producers and Caribbean sugar consumers.
- b. Caribbean sugar producers and U.S. sugar consumers.
- c. U.S. sugar producers and Caribbean sugar consumers.
- d. U.S. sugar producers and U.S. sugar consumers.

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

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

(9) Suppose the price of apples in Des Moines is \$0.80 per pound and the cost of shipping apples between Des Moines and Omaha is \$0.50 per pound. Markets are *out of equilibrium* if the price of apples in Omaha is

- a. \$0.20 per pound.
- b. \$0.70 per pound.
- c. \$1.00 per pound.
- d. \$1.20 per pound.

(10) Suppose the price of a share of stock in XYZ Corporation 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 XYZ Corporation tomorrow will be

- a. less than \$50.
- b. about \$50.
- c. greater than \$50.
- d. cannot be determined from information given.

(11) A quota on *selling* ivory would cause the price of ivory to

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

(12) Suppose the price elasticity of demand for hearing aids is -1.0 and the price elasticity of supply is 5.0. If the government offers a subsidy for hearing aids,

- a. Sellers will enjoy most of the benefit.
- b. Buyers will enjoy most of the benefit.
- c. Sellers and buyers each enjoy half of the benefit.
- d. Answer depends on which side is legally designated to receive the subsidy check from the government.

(13) A Laffer curve shows the relationship between

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

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 ice cream is \$2 per gallon, the average household buys 10 gallons per year. If the price is \$4 per gallon, the average household buys 8 gallons per year. Compute the price elasticity of demand for ice cream using the “arc-elasticity” formula.

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(2) [Using price of demand: 10 pts] Suppose we want to reduce cigarette consumption by 6 percent. Also suppose that the price elasticity of demand for cigarettes is -0.3.

- a. According to the information above, is demand for cigarettes *elastic*, *inelastic*, or *unitary-elastic*?
- b. To reduce cigarette consumption by the targeted amount, should the price *increase*, *decrease*, or remain *constant*?
- c. ... by approximately how much?
- d. Will total spending by consumers on cigarettes *increase*, *decrease*, or remain *constant*?
- e. ... by approximately how much?

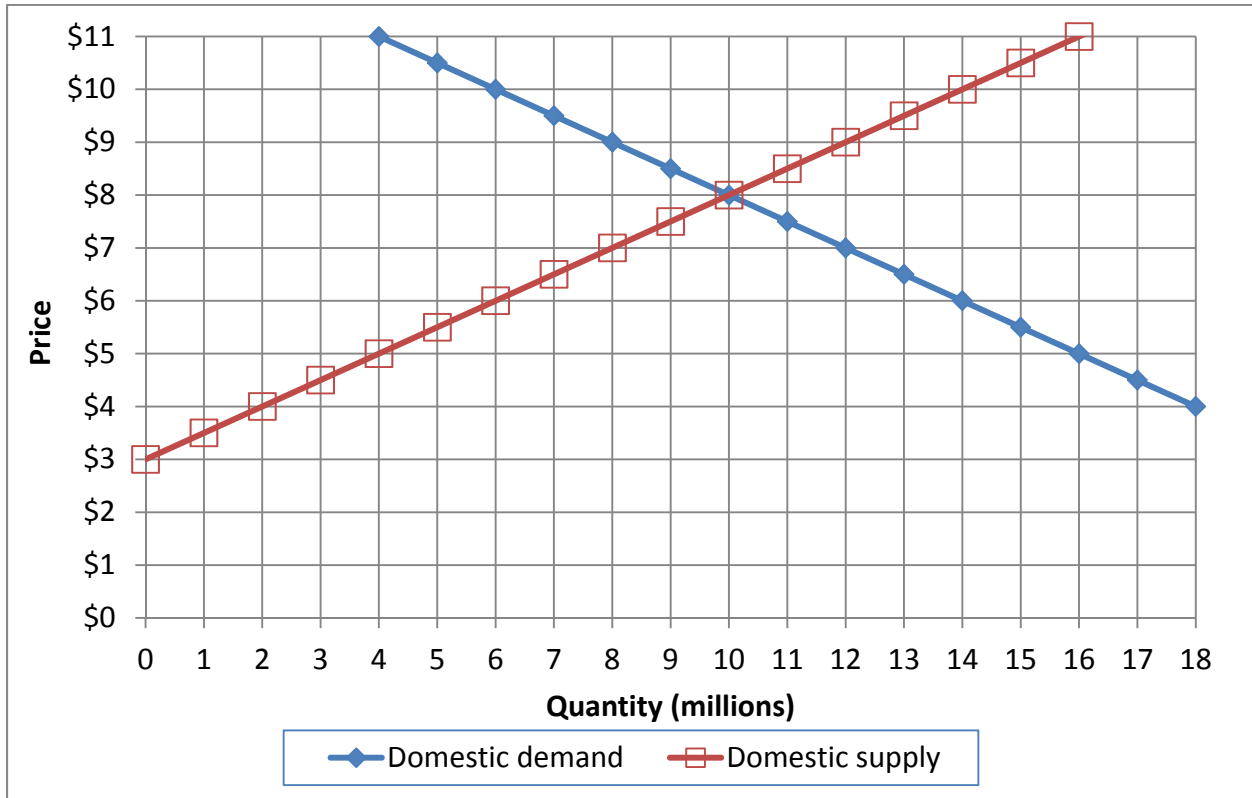
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(3) [Using income elasticities: 10 pts] Suppose the income elasticity of demand for food is 0.3. Now suppose income *rises* by 10%. Assume the price of food does not change.

- a. According to the information above, is food a *necessary good*, an *inferior good*, or a *luxury (or superior) good*?
- b. As income rises, will the quantity of food demanded *increase*, *decrease*, or remain *constant*?
- c. ... by about how much?
- d. Will consumer spending on food, 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 hammers in a particular country are given by the following diagram.



a. At first, international trade in hammers 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 hammers turns out to be **\$ 7**.

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

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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 hammers?

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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 hammers?

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g. By how much?

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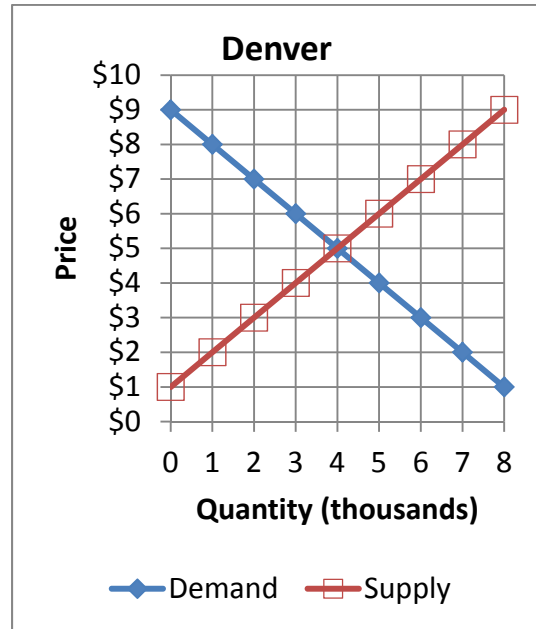
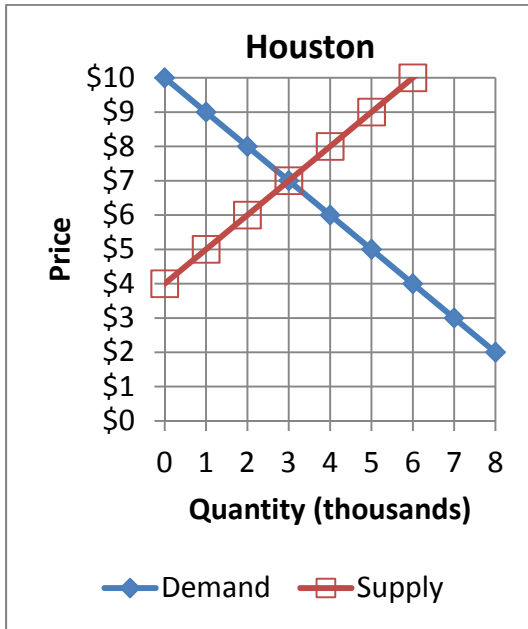
h. Does total social welfare in this country *increase* or *decrease* from international trade in hammers?

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i. By how much?

\$		million
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(5) [Arbitrage: 8 pts] The following graphs show markets for clock-radios in Houston and Denver, in the absence of any arbitrage activity.



Consider the effects of arbitrage.

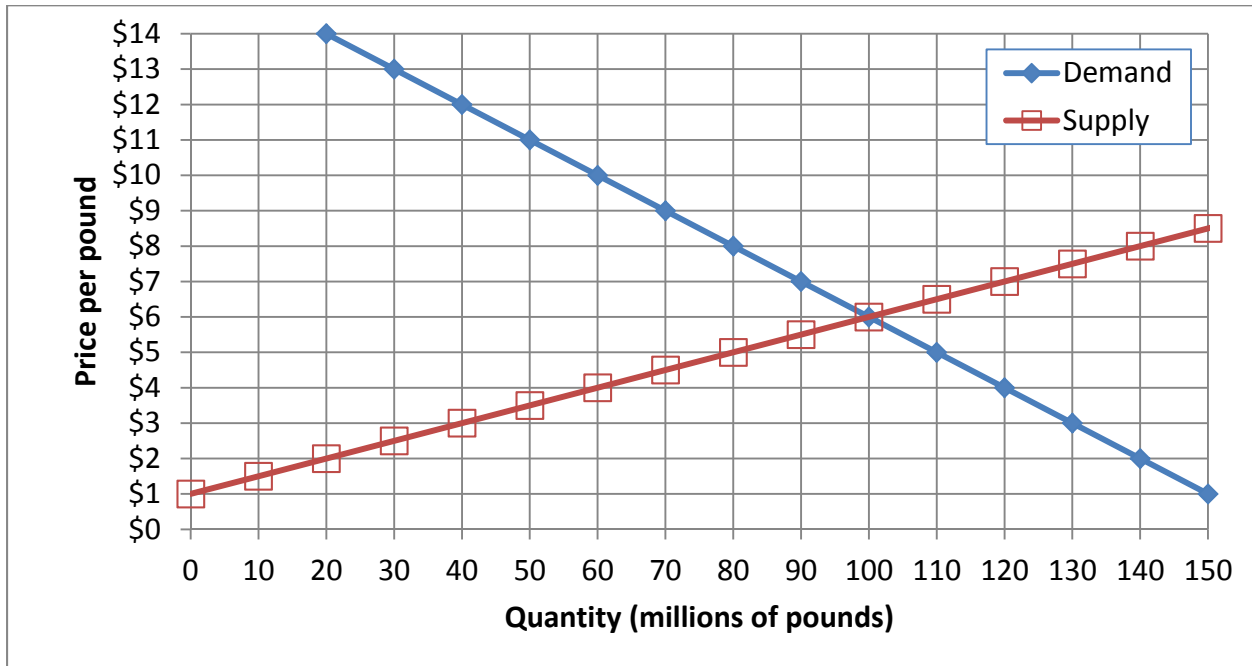
- a. [1 pt] In which city will the demand curve shift right—*Houston, Denver, both cities, or neither city*?
- b. [1 pt] In which city will the supply curve shift right—*Houston, Denver, both cities, or neither city*?

Suppose there are no costs of arbitrage. That is, the cost of moving clock-radios between these two cities is zero.

- c. [2 pts] By how much will these curves shift?
- e. [2 pts] In equilibrium, what will be the price of clock-radios in Houston?
- f. [2 pts] In equilibrium, what will be the price of clock-radios in Denver?

thousand
\$
\$

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



a. Find the equilibrium price without government intervention.

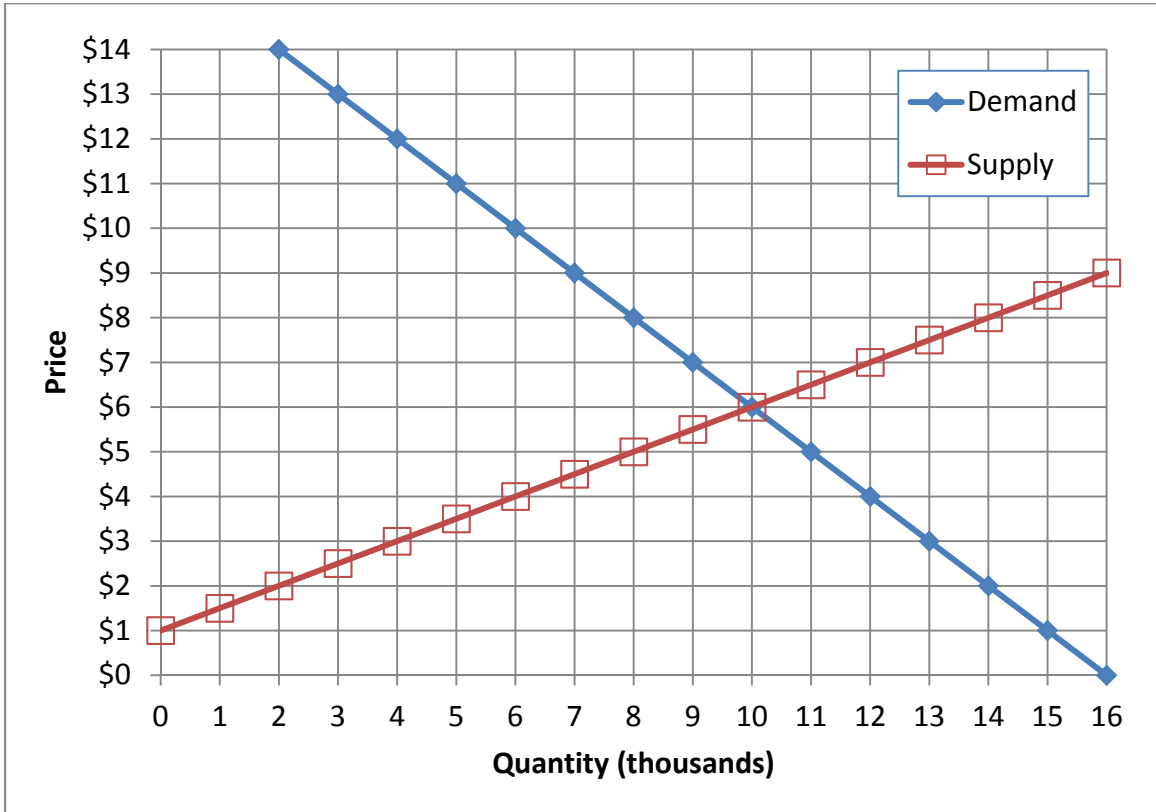
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Suppose the government imposes a price floor (or legal minimum price) of \$ 8 per pound. No cheese may be sold for a price less than the price floor.

- b. How many pounds of cheese will actually be sold?
- c. Will there be *excess demand*, *excess supply*, or *neither*?
- d. How much?
- 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 cheese is produced and sold by those producers who have the lowest cost.)
- f. By how much?
- g. Does consumer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention?
- h. By how much?
- i. Compute the deadweight social loss caused by the price floor.

	million pounds
	million pounds
\$	million
\$	million
\$	million

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



Suppose the government imposes an excise **tax of \$ 6** per teeshirt.

- 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.

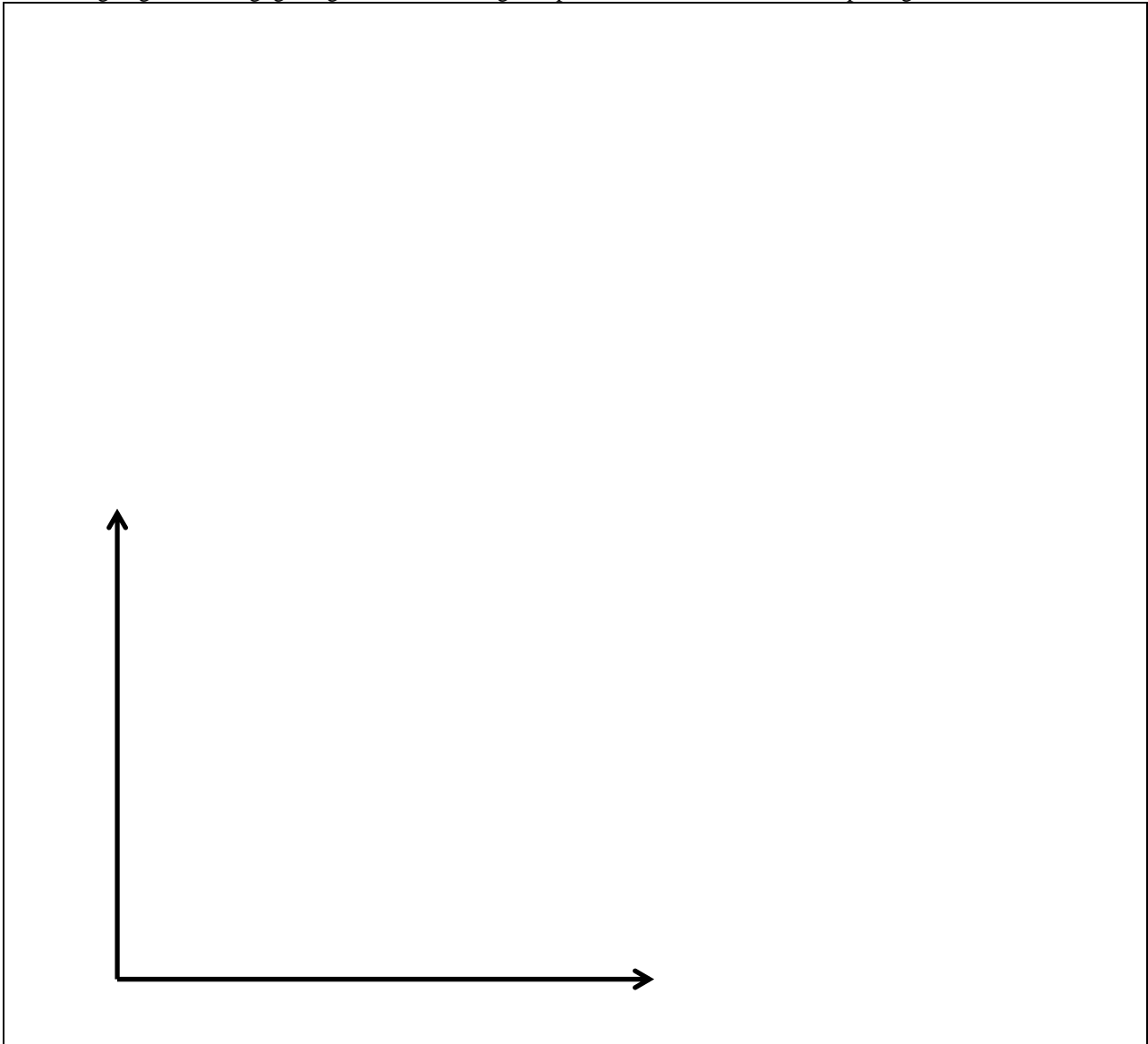
	thousand
\$	per teeshirt
\$	per teeshirt
\$	thousand
\$	thousand
\$	thousand
\$	thousand

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

(1) A study¹ found that when tobacco cigarette prices increased by 10 percent, use of marijuana by young people *decreased* by about 12 percent. Does this indicate that marijuana and tobacco cigarettes are *substitutes* or *complements*? Why? Compute the cross-price elasticity of demand for marijuana with respect to the price of cigarettes for young people (note: the sign is important).

(2) Suppose a price ceiling were placed on infant formula. Would this help ensure that more babies had access to infant formula? Justify your answer with a supply-and-demand graph.

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]

¹ Frank J. Chaloupka, Rosalie L Riccardo Pacula, Matthew C. Farrelly, Lloyd D. Johnston, Patrick M. O'Malley, "Do Higher Cigarette Prices Encourage Youth to Use Marijuana?" NBER Working Paper No. 6939, February 1999.