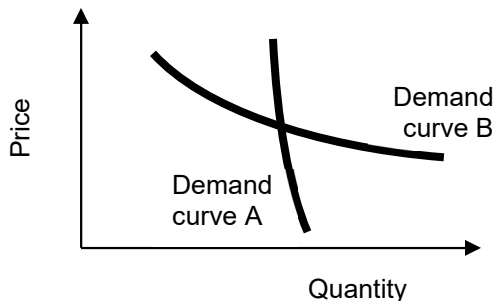


EXAMINATION 2 VERSION A
“Applications of Supply and Demand”
October 9, 2025

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, cell phones, and wireless devices 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, 14 pts total]

- (1) The units of measure for the price elasticity of demand for milk are
- a. gallons per dollar.
 - b. dollars per gallon.
 - c. percent.
 - d. The elasticity is a pure number and has no units of measure.
- (2) Which demand curve below is *more* elastic?
- a. Demand curve A.
 - b. Demand curve B.
 - c. Both have the same elasticity because they pass through the same point.
 - d. Cannot be determined from information given.



- (4) The price elasticity of demand for medical care has been estimated to be about -0.3 . If the price of medical care rises, then the amount of money consumers spend on medical care will
- a. increase.
 - b. decrease.
 - c. remain constant.
 - d. cannot be determined from information given.
- (5) The supply curve in the graph below is
- a. perfectly elastic.
 - b. perfectly inelastic.
 - c. unitary elastic.
 - d. Cannot be determined from information given.



- (3) If consumers have more time to adjust to a price change of a good, the demand for the good will be
- a. more elastic.
 - b. less elastic.
 - c. perfectly inelastic.
 - d. Cannot be determined from information given.

The next three questions refer to the following demand and supply schedules for corn in two countries.

	Country X		Country Y	
Price	Q_D	Q_S	Q_D	Q_S
\$1	110	10	50	30
\$2	100	20	45	35
\$3	90	30	40	40
\$4	80	40	35	45
\$5	70	50	30	50
\$6	60	60	25	55
\$7	50	70	20	60

(6) In the absence of international trade, Country X's equilibrium price of corn would be

- a. \$2.
- b. \$3.
- c. \$4.
- d. \$5.
- e. \$6.

(7) With international trade, the equilibrium price of corn in both countries would be

- a. \$2.
- b. \$3.
- c. \$4.
- d. \$5.
- e. \$6.

(8) Who in Country X benefits from international trade in corn?

- a. Buyers in Country X.
- b. Sellers in Country X.
- c. Both buyers and sellers in Country X.
- d. Neither buyers nor sellers in Country X.

(9) Suppose there is a change in government policy affecting the health care industry. Which of the following outcomes would be a *Pareto improvement*?

- a. Producers gain \$20 billion while consumers lose \$10 billion.
- b. Producers gain \$10 billion while consumers gain \$20 billion.
- c. Producers gain \$10 billion while consumers lose \$20 billion.
- d. Both (a) and (b).
- e. All of the above.

(10) 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.

(11) Suppose the price of a pumpkin in Des Moines is \$7 and the cost of shipping a pumpkin between Des Moines and Omaha is \$3. Markets are *out of equilibrium* if the price of pumpkins in Omaha is

- a. \$2.
- b. \$5.
- c. \$6.
- d. \$9.

(12) Arbitrage *cannot* guarantee that people in Iowa and Chicago pay similar prices for

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

(13) A quota (or legal maximum quantity) on *selling* rosewood would cause its price to

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

(14) 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.

II. Problems: Please 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 milk is \$5 per gallon, the typical family buys 4 gallons per month, but if the price is \$3 per gallon, the typical family buys 6 gallons per month. Compute the price elasticity of demand for milk using the “arc-elasticity” formula.

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(2) [Cross-price elasticity of demand: 4 pts] Suppose that when the price of hotdogs rises by 20 percent, the quantity of hotdog buns purchased falls by 10 percent.

- From the information above, are hotdogs and buns *substitutes* or *complements* ?
- Compute the cross-price elasticity of demand for buns with respect to the price of hotdogs. (Full credit requires correct sign.)

(3) [Income elasticity of demand: 4 pts] Suppose that when consumers’ income rises by 5 percent, the quantity of hamburger helper purchased falls by 1 percent.

- From the information above, is hamburger helper an *inferior good*, a *necessary good*, or a *luxury (or superior) good* ?
- Compute the income elasticity of demand for hamburger helper. (Full credit requires correct sign.)

(4) [Income elasticity of demand: 8 pts] According to the 2022 Consumer Expenditure Survey, the following are budget shares for low-income and high-income households. For each good, indicate whether it is a necessary good or a luxury good (sometimes called a “superior good”). Also indicate whether the income elasticity of demand is greater or less than one.

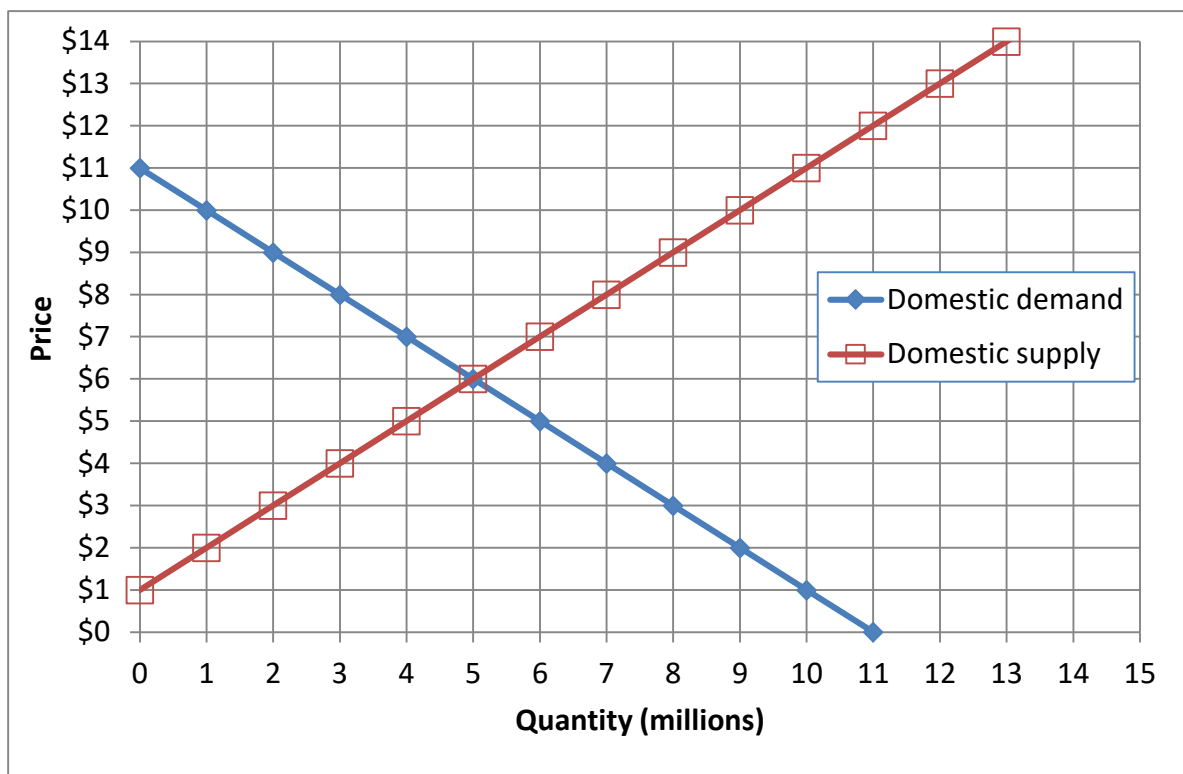
Good	Budget share, low income	Budget share, high income	<i>Necessary good or luxury good?</i>	<i>Income elasticity of demand greater than one or less than one?</i>
a. Gasoline	5.0%	3.3%		
b. New cars	2.4%	4.1%		

(5) [Using price elasticity of demand: 10 pts] Suppose the electric power company *raises* rates by **5%**. Suppose the price elasticity of demand for electricity is **-0.6**. Assume everything else affecting demand for electricity remains constant.

- According to the information above, is demand for electricity *elastic*, *inelastic*, or *unitary-elastic*?
- As the price rises, will the quantity of electricity demanded *increase*, *decrease*, or remain *constant*?
- ... by approximately how much?
- Will the total revenue received by the electric power company *increase*, *decrease*, or remain *constant*?
- ... by approximately how much?

%
%

(6) [Welfare analysis of international trade: 18 pts] Domestic supply and demand for alarm clocks in a particular country are shown in the following graph.



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

\$

Then this industry is opened to international trade and the international price of alarm clocks turns out to be \$ 8.

b. Will this country now *export* or *import* alarm clocks?

c. How many?

million

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

e. By how much?

\$ million

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

g. By how much?

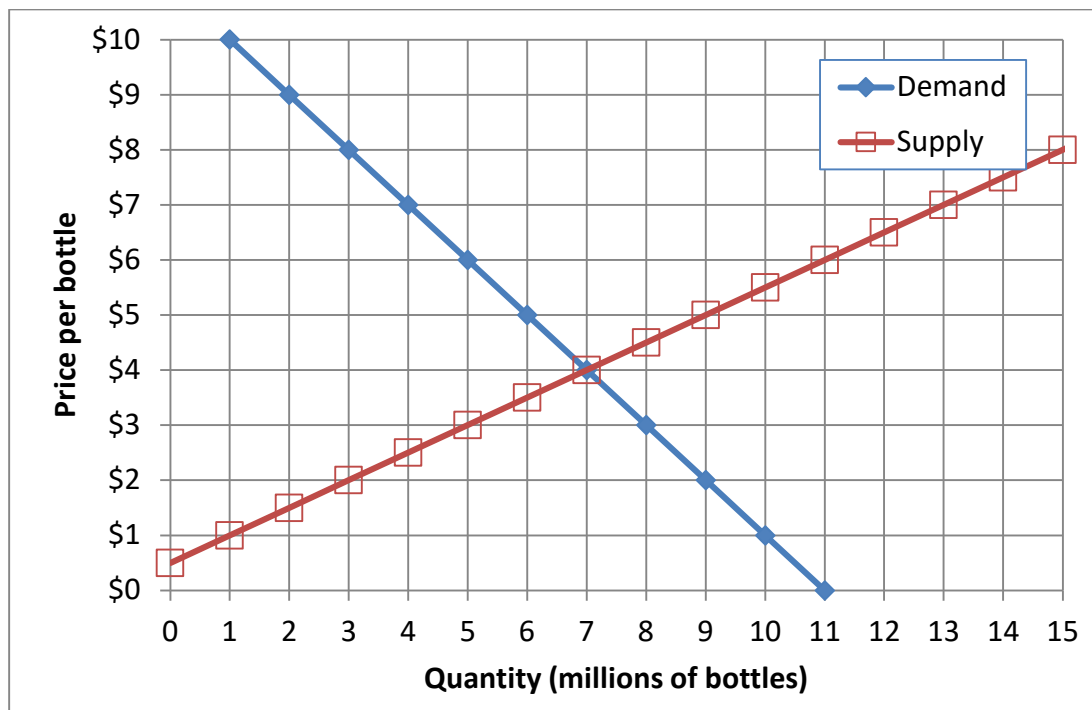
\$ million

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

i. By how much?

\$ million

(7) [Welfare analysis of market controls: 18 pts] The graph below shows the market for vitamins.



a. Find the equilibrium price without government intervention.

\$

Suppose the government imposes a price ceiling (or legal maximum price) of \$3. No vitamins may be sold for a price higher than the price ceiling.

b. How many vitamins will actually be sold?

million

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

d. How much?

million

e. Does producer surplus *increase*, *decrease*, or *remain constant* because of the price ceiling, as compared to the market without government intervention?

f. By how much?

\$ million

g. Does consumer surplus *increase*, *decrease*, or *remain constant* because of the price ceiling, as compared to the market without government intervention? (Assume optimistically that vitamins are purchased by those consumers who have the highest willingness-to-pay.)

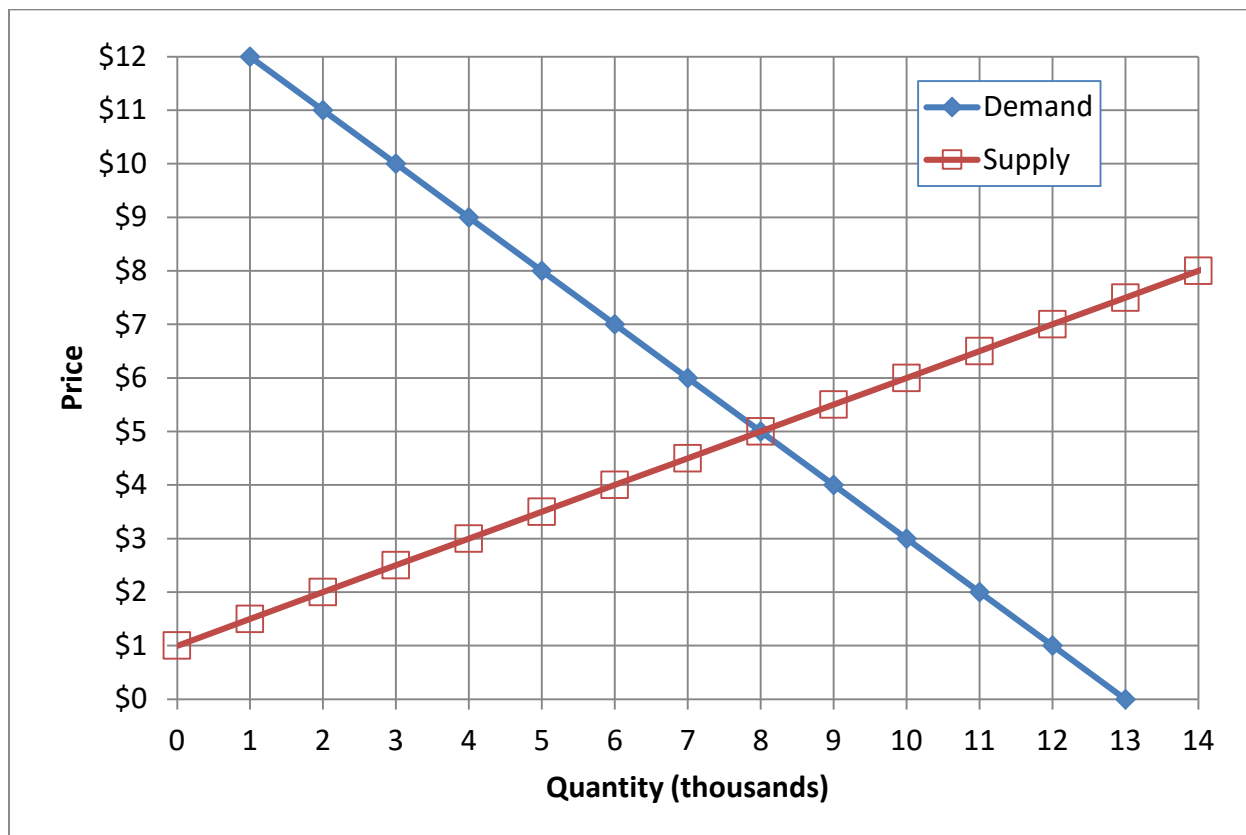
h. By how much?

\$ million

i. Compute the deadweight social loss caused by the price ceiling.

\$ million

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



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

- 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 pumpkin
\$	per pumpkin
\$	thousand
\$	thousand
\$	thousand
\$	thousand

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

- (1) Suppose a country opens its tee-shirt industry to international trade. As a consequence, the price of tee-shirts falls from \$10 to \$6, and 15 million tee-shirts are imported. Does the country's overall welfare *increase* or *decrease* as a result of this change? By how much? Show your work and circle your final answer. Illustrate your work with a supply-and-demand graph of the market for tee shirts. Label both axes and all curves.
- (2) Suppose the government imposed maximum prices on children's car seats. Would this action tend to increase the number of car seats sold? Explain why or why not. Illustrate your answer with a supply-and-demand graph of the market for car seats. Label both axes and all curves.

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]