ECON 002 - Principles of Microeconomics
Drake University, Spring 2024
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Signature: _____

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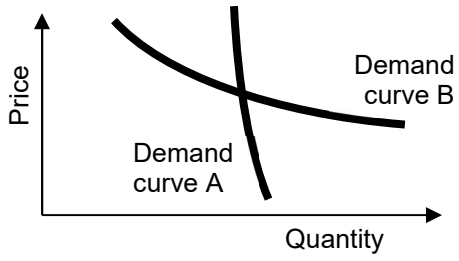
EXAMINATION 2 VERSION B
"Applications of Supply and Demand"
March 20, 2024

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) 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.



(2) The units of measure for the price elasticity of demand for donuts are
a. dozens per dollar.
b. dollars per dozen.
c. percent.
d. The elasticity is a pure number and has no units of measure.

(3) It takes time for consumers to adjust their lifestyles to changes in electricity prices. Therefore, the short-run demand for electricity is
a. more elastic than the long-run demand.
b. less elastic than the long-run demand.
c. just as elastic as the long-run demand.
d. Elasticity of demand is not related to time for adjustment.

(4) The price elasticity of demand for apples has been estimated to be about – 0.3. If the price of apples rises, then the amount of money consumers spend on apples will
a. increase.
b. decrease.
c. remain constant.
d. cannot be determined from information given.

(5) In recent years, the demand for pork in East Asia has shifted right due to rising incomes there. Because pork is traded internationally, this should cause the price of pork in the United States to
a. rise.
b. fall.
c. rise or fall, depending on the shapes of the demand and supply curves.
d. remain constant.

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

	Country X		Country Y	
Price	Q_D	Q_S	Q_D	Q_S
$1	65	15	50	10
$2	60	20	40	20
$3	55	25	30	30
$4	50	30	20	40
$5	45	35	10	50
$6	40	40	0	60
$7	35	45	0	70

(6) In the absence of international trade, Country X's equilibrium price of wheat would be
a. $2.
b. $3.
c. $4.
d. $5.
e. $6.

(7) With international trade, the equilibrium price of wheat 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 wheat?
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.

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(9) Suppose there is a change in government policy affecting the automobile industry. Which of the following outcomes would *pass the compensation test* of Kaldor and Hicks?
a. Producers gain $5 billion while consumers lose $10 billion.
b. Producers gain $10 billion while consumers lose $5 billion.
c. Producers gain $5 billion while consumers are unaffected.
d. Both (b) and (c).
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 watermelons is $8 in Kansas City and the cost of shipping a watermelon between Des Moines and Kansas City is $3. Markets are *out of equilibrium* if the price of melons in Des Moines is
a. $1.
b. $6.
c. $8.
d. $10.

(12) Arbitrage guarantees that people in Denver and Chicago pay similar prices for
a. haircuts.
b. gravel.
c. houses.
d. foreign currency.
e. all of the above.

(13) A quota (or legal maximum quantity) on *selling* ivory 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 supply for apartment rentals is 0.3 and the price elasticity of demand is -1.0 . If the city imposes a tax on apartment rentals,
a. sellers (landlords) will pay most of the tax.
b. buyers (renters) 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 blue-ink pens is $0.90, 100 are sold each day, but if the price is $0.70, 300 are sold each day. Compute the price elasticity of demand for blue-ink pens using the "arc-elasticity" formula.

(2) [Cross-price elasticity of demand: 4 pts] Suppose that when the price of bus fares rises by 50 percent, the quantity of taxi rides taken rises by 10 percent.

a. From the information above, are bus fares and taxi rides *substitutes* or *complements* ?
b. Compute the cross-price elasticity of demand for taxi rides with respect to the price of bus fares. (Full credit requires correct sign.)

(3) [Income elasticity of demand: 4 pts] Suppose that when consumers' income rises by 4 percent, the quantity of new cars purchased rises by 6 percent.

a. From the information above, are new cars an *inferior good,* a *necessary good,* or a *luxury (or superior) good* ?
b. Compute the income elasticity of demand for new cars. (Full credit requires correct sign.)

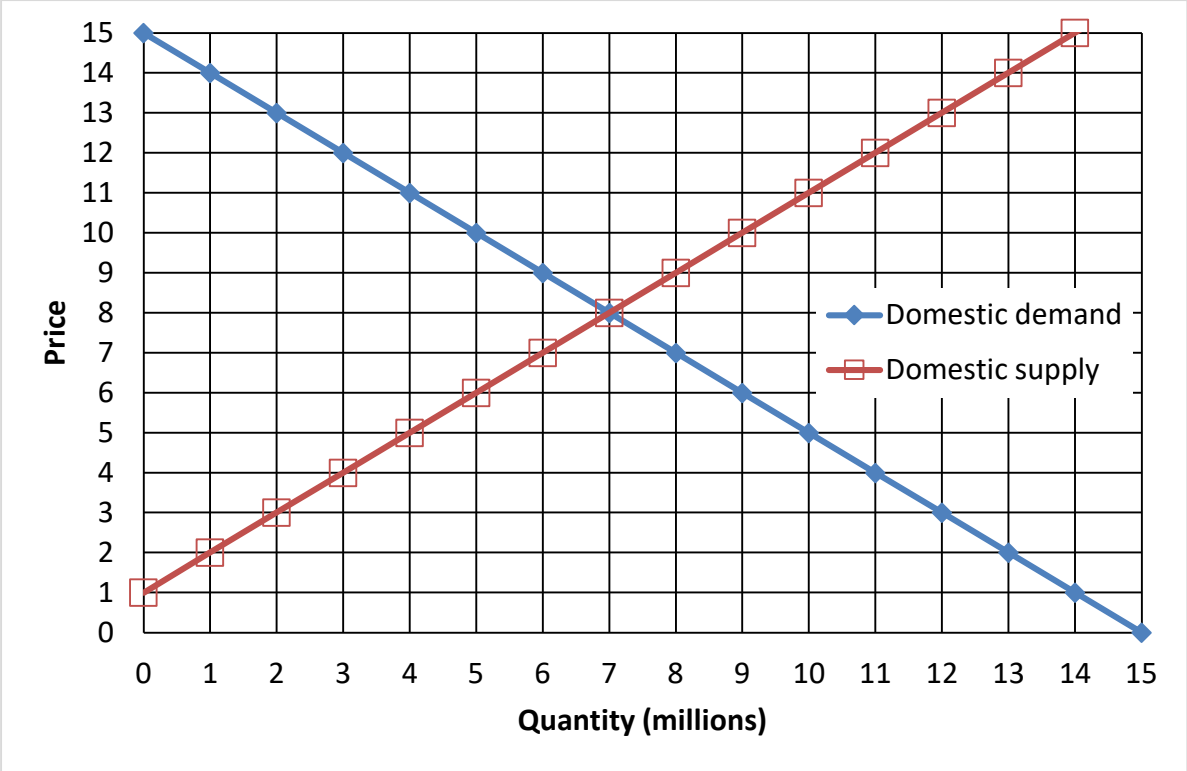
(4) [Income elasticity of demand. 8 pts] According to the Consumer Expenditure Survey, the following are budget shares for low-income and high-income households. For each good, indicate whether it is a necessary good or a luxury good (sometimes called a "superior good"). Also indicate whether the income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

Good	Budget share, low income	Budget share, high income	*Necessary good* or *luxury good?*	Income elasticity of demand *greater than one* or *less than one?*
a. Furniture	0.6%	1.3%		
b. Cellular phone service	2.0%	1.3%		

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

a. According to the information above, is demand for electricity *elastic, inelastic,* or *unitary-elastic*?
b. As the price rises, will the amount of electricity used *increase*, *decrease*, or remain *constant*?
c. ... by approximately how much? %
d. Will the total revenue received by the electric company *increase*, *decrease*, or remain *constant*?
e. ... by approximately how much? %

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



a. At first, international trade in TV remotes 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 TV remotes turns out to be **$ 10.**

b. Will this country now *export* or *import* TV remotes?

c. How many?

million

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

e. By how much?

$ million

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

g. By how much?

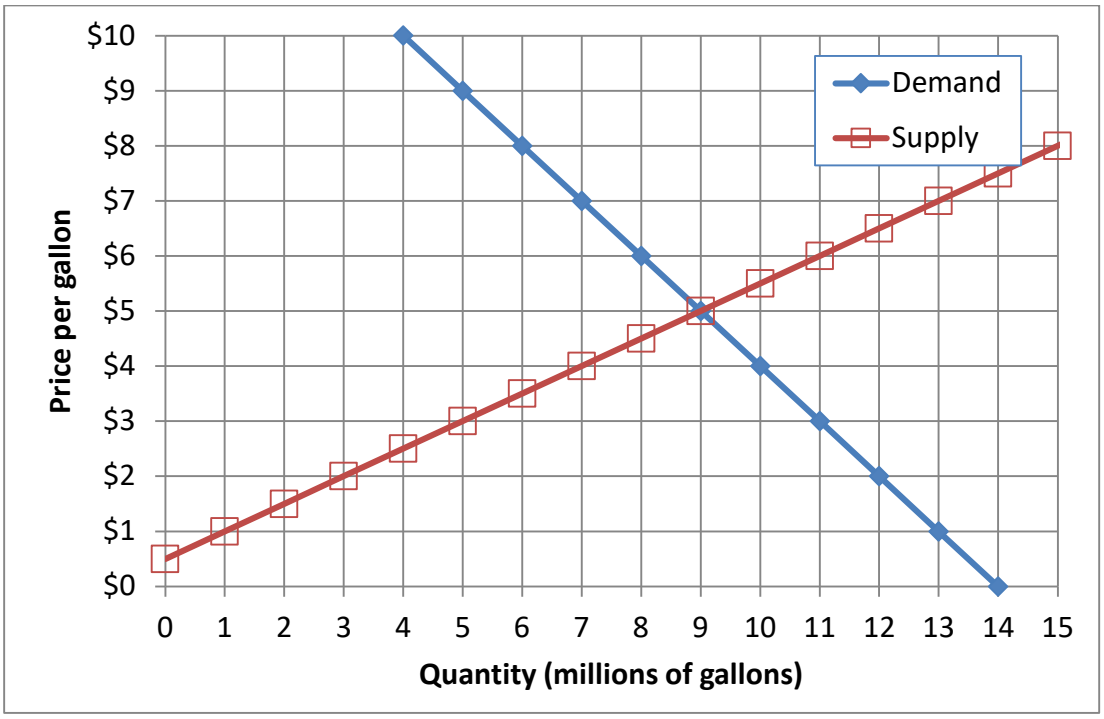
$ million

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

i. By how much?

$ million

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

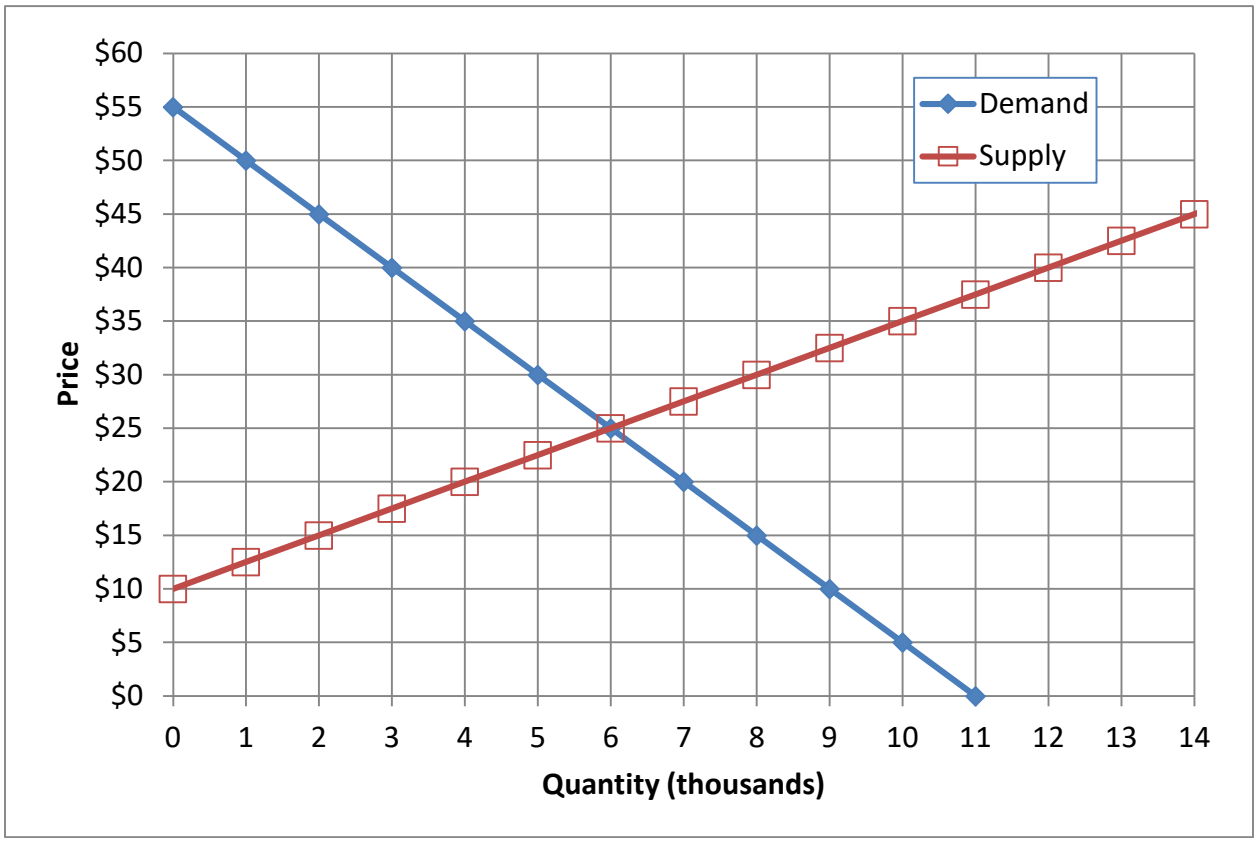


a. Find the equilibrium price without government intervention.	$

Suppose the government imposes a price floor (or legal minimum price) of **$ 7 per gallon**. No milk may be sold for a price less than the price floor.

b. How much milk will actually be sold?	million gallons
c. Will there be *excess demand, excess supply*, or *neither*?	
d. How much?	million gallons
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 milk is produced by those producers with the lowest cost.)	
f. By how much?	$ million
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?	$ million
i. Compute the deadweight social loss caused by the price floor.	$ million

(8) [Welfare analysis of tax or subsidy: 18 pts] The graph below shows the market for baseball bats. Note that the price axis is marked off at intervals of $5.



Suppose the government pays a **subsidy of $ 15** per baseball bat.

a. Compute the equilibrium quantity sold.	thousand
b. Compute the equilibrium total price received by sellers (including the subsidy).	$ per baseball bat
c. Compute the equilibrium net price paid by buyers (excluding the subsidy).	$ per baseball bat
d. Does producer surplus *increase, decrease,* or *remain constant* because of the subsidy?	
e. By how much?	$ thousand
f. Does consumer surplus *increase, decrease,* or *remain constant* because of the subsidy?	
g. By how much?	$ thousand
h. Compute the direct cost of the subsidy to the government—that is, the amount that the government will have to pay buyers and/or sellers.	$ thousand
i. Compute the deadweight social loss caused by the subsidy.	$ thousand

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

(1) A study[1] found that when tobacco cigarette prices increased by 10 percent, use of marijuana by young people *decreased* by about 12 percent. (Ignore the graph below.)
   a. Does this indicate that marijuana and tobacco cigarettes are *substitutes* or *complements*? Why?
   b. Compute the cross-price elasticity of demand for marijuana with respect to the price of cigarettes.

(2) Consider the following statement. "The higher the tax rate, the more tax revenue the government collects." Do you agree or disagree? Justify your answer with a supply-and-demand graph. 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]

[1] Frank J. Chaloupka, Rosalie Liccardo 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.