ECON 002 - Principles of Microeconomics
Drake University, Fall 2023
William M. Boal

Signature: _____

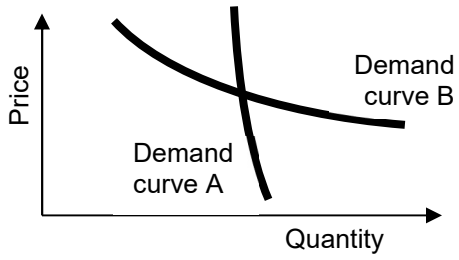
Printed name: _____

EXAMINATION 2 VERSION A
"Applications of Supply and Demand"
October 11, 2023

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, 20 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 beef are
a. pounds per dollar.
b. dollars per pound.
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 gasoline prices. Therefore, the long-run demand for gasoline is
a. just as elastic as the short-run demand.
b. more elastic than the short-run demand.
c. less elastic than the short-run demand.
d. Elasticity of demand is not related to time for adjustment.

(4) The price elasticity of demand for Hunts brand tomato sauce has been estimated to be about –3.0. If the price of Hunts tomato sauce rises, then the amount of money consumers spend on Hunts tomato sauce will
a. increase.
b. decrease.
c. remain constant.
d. cannot be determined from information given.

(5) If bagels and doughnuts are substitutes, then the cross-price elasticity of demand for doughnuts with respect to the price of bagels must be
a. positive
b. negative.
c. zero.
d. cannot be determined from information given.

(6) If the quantity supplied of some good, such as paintings by Andy Warhol (1928-1987), is exactly the same, regardless of the price, then the supply is
a. elastic.
b. perfectly elastic.
c. inelastic.
d. perfectly inelastic.
e. cannot be determined from information given.

The next four 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	90	10	45	35
\$2	80	20	40	40
\$3	70	30	35	45
\$4	60	40	30	50
\$5	50	50	25	55
\$6	40	60	20	60
\$7	30	70	15	55

(7) 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.

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

(9) With international trade, the equilibrium price of corn in both countries would be
a. \$2.
b. \$3.
c. \$4.
d. \$5.
e. \$6.

(10) 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.

---

(11) "Fracking" technology shifted the supply of oil to the right in the U.S. Because oil is traded internationally, it also caused the price of oil in Japan to
a. rise.
b. fall.
c. remain constant.
d. Cannot be determined from information given.

(12) 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.

(13) 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.

(14) Suppose the price of silver were higher in Paris than in London, initially. Arbitrage would then *tend to*
a. raise the price of silver in both cities.
b. lower the price of silver in both cities.
c. raise the price of silver in Paris and lower the price in London.
d. raise the price of silver in London and lower the price in Paris.

(15) 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.

(16) A price floor (or legal minimum price) on bananas, if it were binding, would create
a. excess demand for bananas.
b. excess supply of bananas.
c. neither excess demand nor excess supply.
d. Cannot be determined from information given.

(17) A quota (or legal maximum quantity) on *selling* mahogany 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.

(18) Which would *increase* the quantity sold of infant car seats?
a. A tax on infant car seats.
b. A subsidy for infant car seats.
c. Both of the above.
d. None of the above.

(19) If the government provides a subsidy to parents who send their children to private preschools, who will likely enjoy the benefit of the subsidy?
a. Parents.
b. Preschools.
c. Both of the above.
d. None of the above.

(20) 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 electricity is 12 cents per kilowatt-hour, the typical household uses 300 kilowatt-hours per month; but if the price is 8 cents per kilowatt-hour, the typical household uses 500 kilowatt-hours per month. Compute the price elasticity of demand for electricity using the "arc-elasticity" formula.

(2) [Cross-price elasticity of demand: 4 pts] Suppose that when the price of watermelon rises by 20 percent, the quantity of cantaloupe purchased rises by 4 percent.
a. From the information above, are watermelon and cantaloupe *substitutes* or *complements* ?
b. Compute the cross-price elasticity of demand for cantaloupe with respect to the price of watermelon. (Full credit requires correct sign.)

(3) [Income elasticity of demand: 4 pts] Suppose that when consumers' income rises by 5 percent, the quantity of concert tickets purchased rises by 8 percent.

a. From the information above, are concert tickets an *inferior good,* a *necessary good,* or a *luxury (or superior) good* ?
b. Compute the income elasticity of demand for concert tickets. (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.

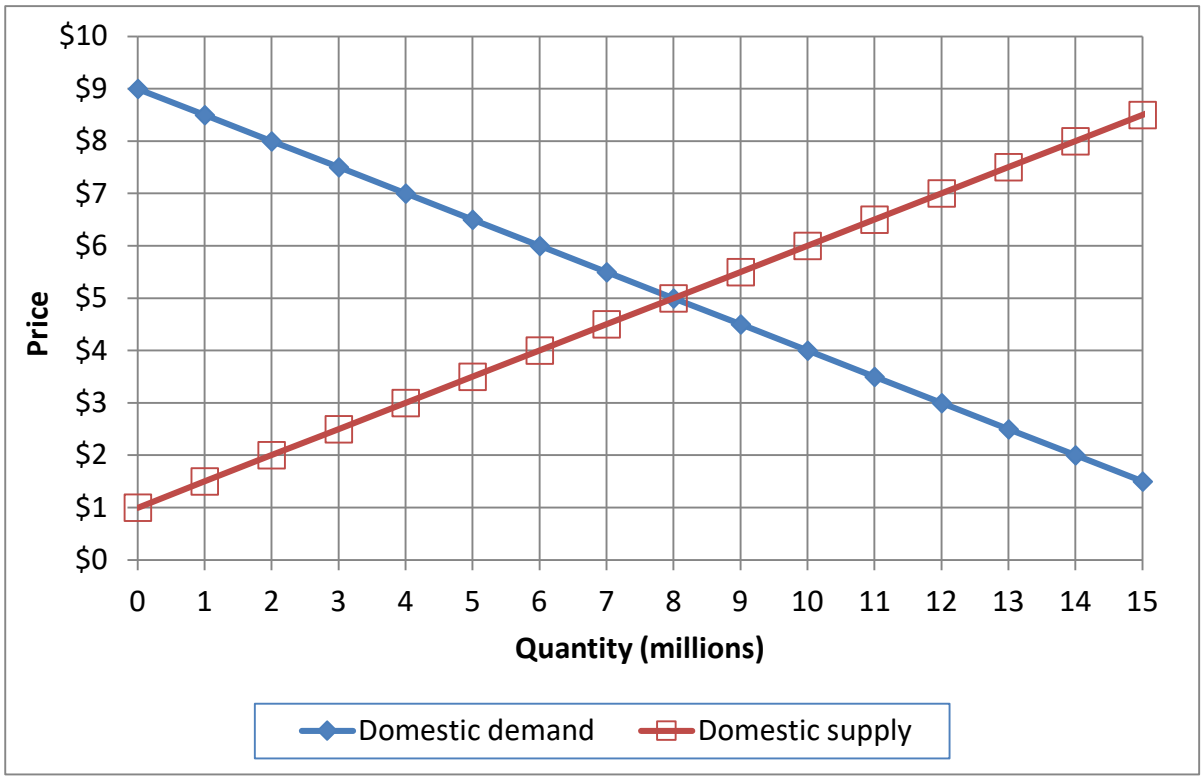
Good	Budget share, low income	Budget share, high income	*Necessary good* or *luxury good?*	Income elasticity of demand *greater than one* or *less than one?*
a. Health care	10.0%	6.8%		
b. Entertainment	4.5%	6.2%		

(5) [Using price elasticity of demand: 10 pts] Suppose the water utility *raises* its price by 5%. Suppose the price elasticity of demand for water is -0.4. Assume everything else affecting demand for water remains constant.

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

%
%

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

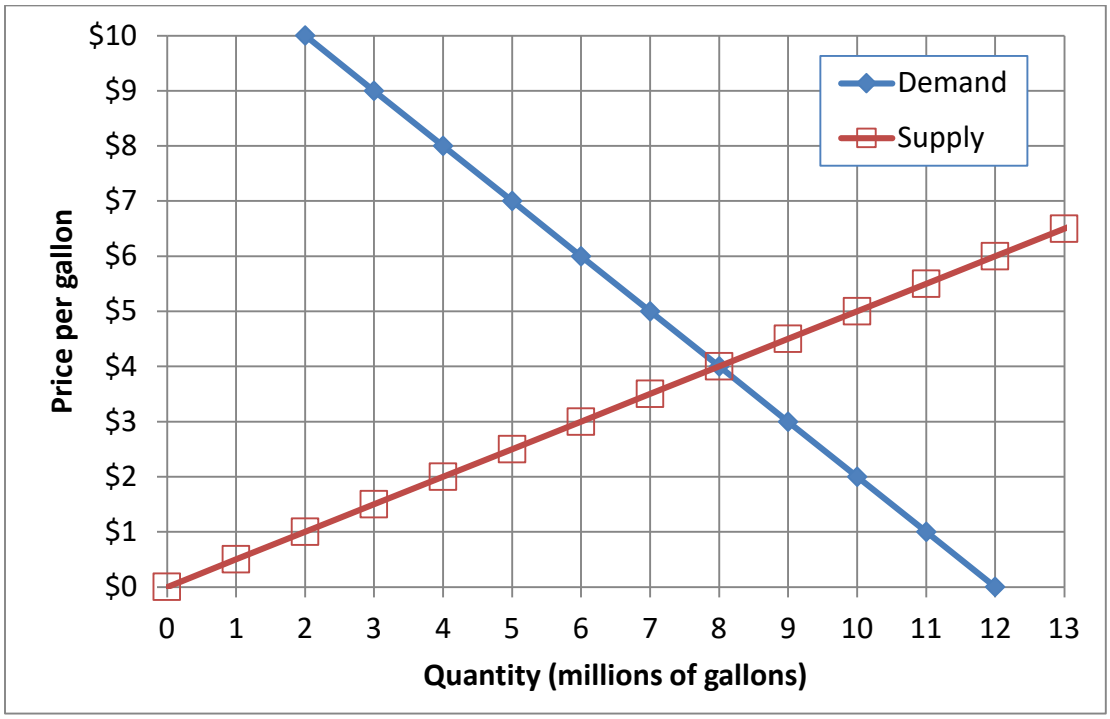


a. At first, international trade in wristwatches is not permitted. Find the equilibrium price without international trade. | $ |

Then this industry is opened to international trade and the international price of wristwatches turns out to be **$ 7.**

b. Will this country now *export* or *import* wristwatches? |
c. How many? | million
d. Does consumer surplus in this country *increase or decrease* from international trade in wristwatches? |
e. By how much? | $ million
f. Does producer surplus in this country *increase or decrease* from international trade in wristwatches? |
g. By how much? | $ million
h. Does total social welfare in this country *increase or decrease* from international trade in wristwatches? |
i. By how much? | $ million

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



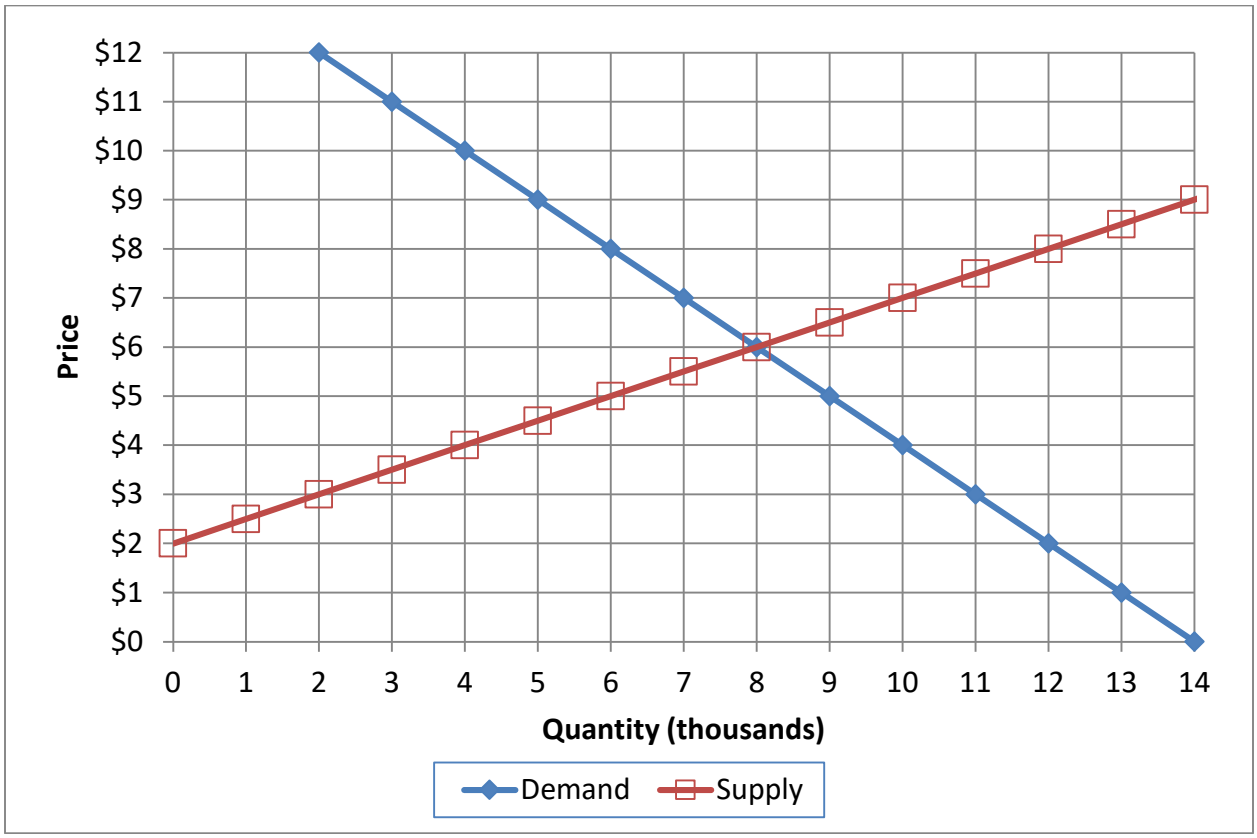
a. Find the equilibrium price without government intervention.

$

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

b. How much gasoline 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 gasoline 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 leaf rakes.



Suppose the government pays a **subsidy of $ 3** per rake.

a. Compute the equilibrium quantity sold.	thousand
b. Compute the equilibrium total price received by sellers (including the subsidy).	$ per rake
c. Compute the equilibrium net price paid by buyers (excluding the subsidy).	$ per rake
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) Consider the following proposal. "American international trade policy should put American workers and American businesses first. Imports of steel should be banned if they are priced lower than steel made by Americans." Who will win and who will lose from this policy? Is this a good policy for America as a whole? Justify your answer with a supply-and-demand diagram of the market for steel, using the concepts of consumer and producer surplus.

(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. 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]