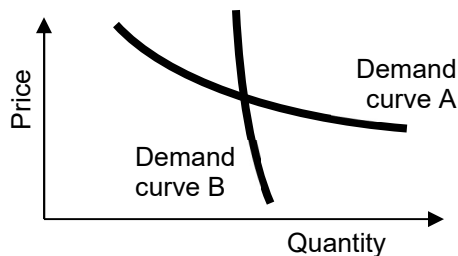


EXAMINATION 2 VERSION B
"Applications of Supply and Demand"
October 12, 2022

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 write your name and "Version B" on your answer sheet. Then mark the one best answer to each question on the answer sheet. [1 pt each, 30 pts total]

- (1) 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.



- (2) Assume that Japanese consumers are similar to U.S. consumers in their behavior. However, electricity in Japan is priced in yen, not in dollars, and at current exchange rates one dollar is worth about 143 yen. Therefore, in absolute value, the price elasticity of demand for electricity in Japan must be
- less than the elasticity in the U.S.
 - greater than the elasticity in the U.S.
 - the same as the elasticity in the U.S.
 - zero.

- (3) A good that has no close substitutes will likely have a price elasticity of demand that is
- small, in absolute value.
 - large, in absolute value.
 - infinite.
 - cannot be determined.

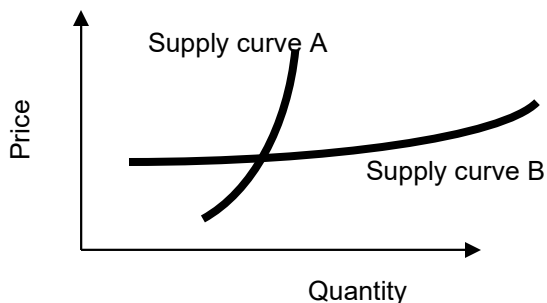
- (4) It takes time for consumers to adjust their lifestyles to changes in gasoline prices. Therefore, the long-run demand for gasoline is
- just as elastic as the short-run demand.
 - more elastic than the short-run demand.
 - less elastic than the short-run demand.
 - Elasticity of demand is not related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

- (5) 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.

- (6) Assuming that mac-and-cheese dinners are an *inferior good*, the income elasticity of demand for mac-and-cheese dinners must be
- negative.
 - exactly zero.
 - between zero and one.
 - exactly one.
 - greater than one.

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

- (8) Which supply curve below is *more* elastic?
 a. Supply curve A.
 b. Supply curve B.
 c. Both have the same elasticity because they pass through the same point.
 d. Cannot be determined from the information given.



- (9) Compare the supply of coal when producers are given one week to adjust to a new price, with the supply when producers are given three years to adjust to the new price.

- a. The three-year supply is more elastic.
 b. The one-week supply is more elastic.
 c. Time for adjustment does not affect elasticity.
 d. Cannot be determined from information given.

- (10) Suppose producers of pencils are willing to sell any number of pencils for 10 cents, so that the supply curve is a horizontal line. Then the supply of pencils 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.

Price	Country X		Country Y	
	Q _D	Q _S	Q _D	Q _S
\$1	60	0	60	30
\$2	50	5	50	50
\$3	40	10	40	70
\$4	30	15	30	90
\$5	20	20	20	110
\$6	10	25	10	130
\$7	0	30	0	150

- (11) 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.

- (12) 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.

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

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

- (14) 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.

- (15) In recent years, the supply of soybeans in Latin America has shifted right due to expansion of agriculture there. Because soybeans are traded internationally, this should cause the price of soybeans 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.

- (16) Currently, the price of rice in Japan is much higher than in the U.S., but Japan restricts international trade in rice. If free international trade is permitted, this change will benefit

- a. Japanese rice producers and Japanese rice consumers.
 b. Japanese rice producers and U.S. rice consumers.
 c. U.S. rice producers and Japanese rice consumers.
 d. U.S. rice producers and U.S. rice consumers.

(17) Suppose there is a change in government policy affecting agriculture. 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 lose \$20 billion.
- c. Producers gain \$10 billion while consumers are unaffected.
- d. Both (a) and (c).
- e. All of the above.

(18) To pass the *compensation test of Kaldor and Hicks*, a change in the economy must result in

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

(19) 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.

(20) 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.

(21) Suppose the price of watermelons is \$5 in Kansas City and the cost of shipping a watermelon between Des Moines and Kansas City is \$2. Markets are *in equilibrium* if the price of watermelons in Des Moines is

- a. \$1.
- b. \$4.
- c. \$8.
- d. \$10.

(22) Arbitrage guarantees that people in Denver and Chicago pay similar prices for

- a. houses.
- b. gold.
- c. haircuts.
- d. gravel.

(23) 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 \$4.
- b. a price floor (or legal minimum price) of \$4.
- c. Both of the above would be binding.
- d. None of the above would be binding.

(24) A price ceiling (or legal maximum price) on cheese, if it were binding, would create

- a. excess demand for cheese.
- b. excess supply of cheese.
- c. neither excess demand nor excess supply.
- d. Cannot be determined from information given.

(25) A quota (or legal maximum quantity) on *buying* 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.

(26) Which of the following government controls on a competitive market cause the quantity traded to *decrease*?

- a. price floor (legal minimum price).
- b. quota (or legal maximum quantity) on sellers.
- c. quota (or legal maximum quantity) on buyers.
- d. all of the above.
- e. none of the above.

(27) The federal tax on cigarettes is \$1.01 per pack. This is an example of

- a. an *ad valorem* tax.
- b. an excise or per-unit tax.
- c. a price control.
- d. a subsidy.

(28) 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.

(29) 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.

(30) The amount of vitamins actually sold would increase if the government enacted a

- a. a tax on vitamins.
- b. a subsidy for vitamins.
- c. a price ceiling (or legal maximum price) for vitamins.
- d. all of the above.
- e. none of the above.

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 gasoline is \$5 per gallon, the typical driver uses 28 gallons per month; but if the price is 3 dollars per gallon, the typical driver uses 36 gallons per month. Compute the price elasticity of demand for gasoline using the “arc-elasticity” formula.

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(2) [Cross-price elasticity of demand: 4 pts] Suppose that when the price of peanut butter rises by 20 percent, the quantity of jelly purchased falls by 4 percent.

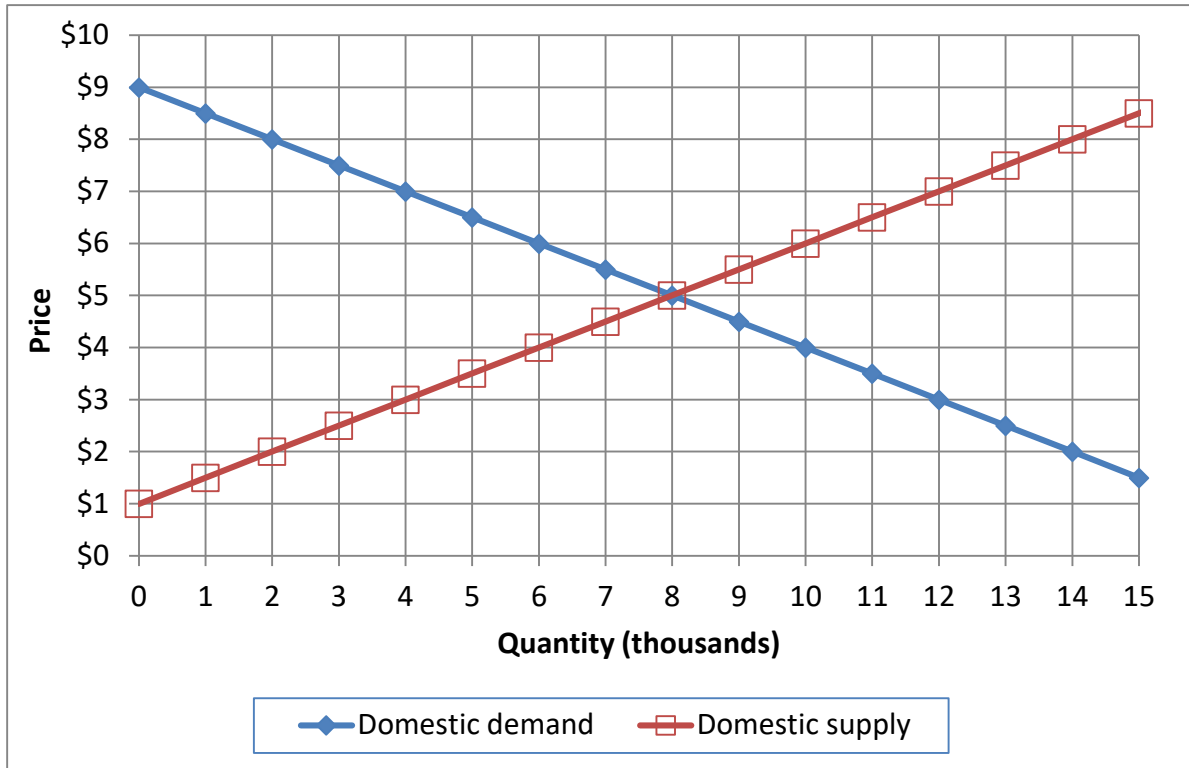
- a. From the information above, are peanut butter and jelly *substitutes* or *complements*?
- b. Compute the cross-price elasticity of demand. (Full credit requires correct sign.)

(3) [Using price elasticity of demand: 10 pts] Suppose the water utility *lowers* its price by 10%. Suppose the price elasticity of demand for water is -0.6. 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 falls, 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?

%
%

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



a. At first, international trade in ball caps 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 ball caps turns out to be **\$ 4**.

b. Will this country now *export* or *import* ball caps?

c. How many?

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

e. By how much?

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

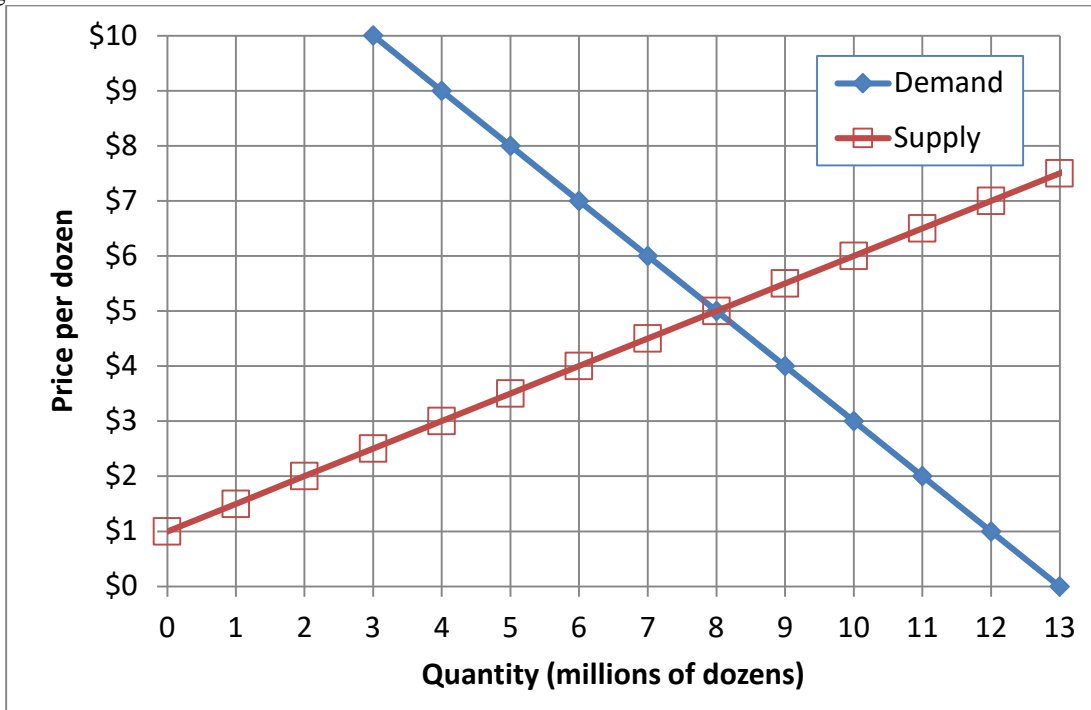
g. By how much?

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

i. By how much?

	thousand
	thousand
	thousand
	thousand

(5) [Welfare analysis of market controls: 18 pts] The following graph shows the market for eggs, which are sold in packages of a dozen.



a. Find the equilibrium price without government intervention.

\$

Suppose the government imposes a price floor (or legal minimum price) of \$ 7. No eggs may be sold for a price less than the price floor.

b. How many eggs will actually be sold?

millions of dozens

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

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d. How much?

millions of dozens

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 sold by those producers who have the lowest cost.)

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f. By how much?

\$	million
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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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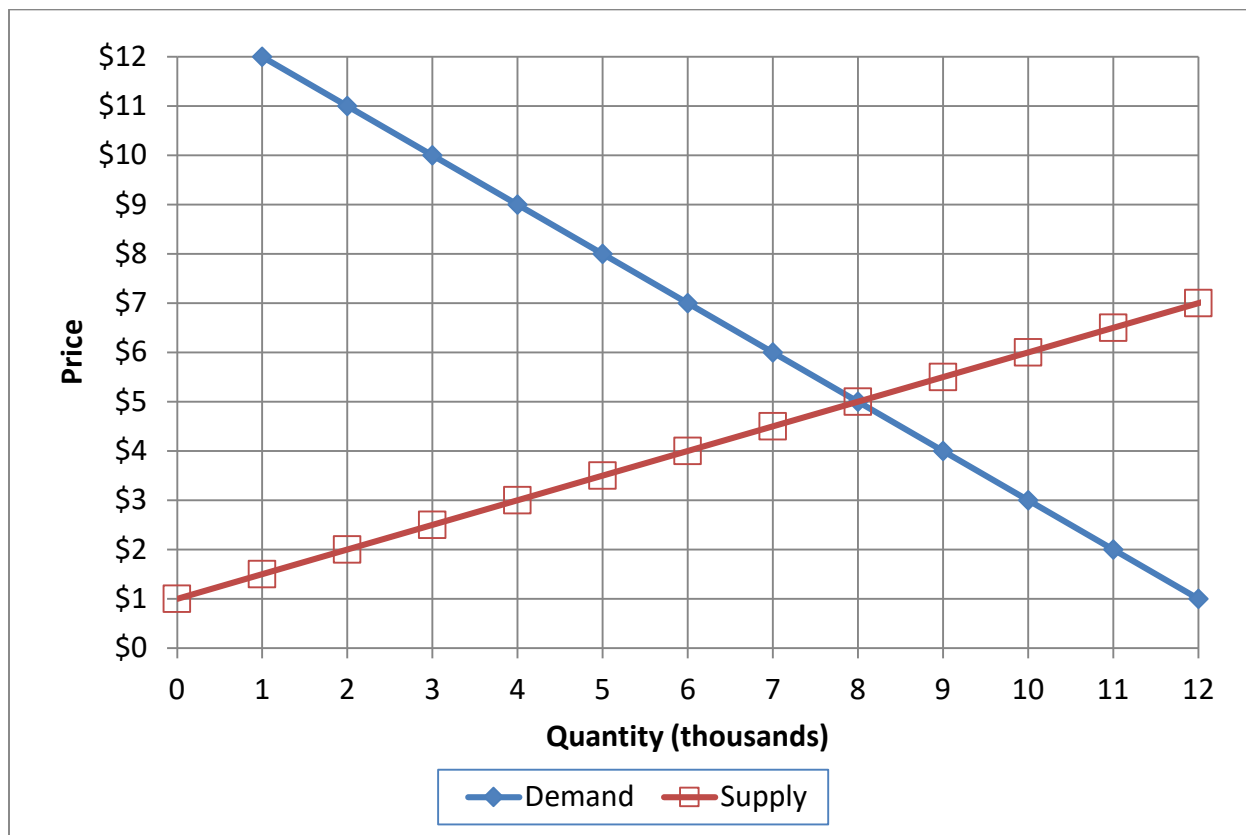
h. By how much?

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

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



Suppose the government imposes an excise tax of \$ 6 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

[end of exam]