# EXAMINATION 2 VERSION B
"Applications of Supply and Demand"
October 9, 2019

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, 12 pts total]

(1) Which demand curve below is *less* 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.
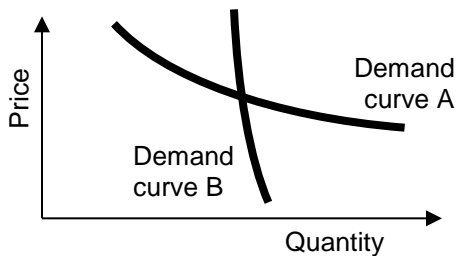
(2) If the price elasticity of demand for a good is small in absolute value (but not zero) then buyers
a.   are not very sensitive to price.
b.   are very sensitive to price.
c.   buy the same amount of the good, regardless of price.
d.   Cannot be determined from information given.

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

(4) The supply curve in the graph below is
a.   perfectly elastic.
b.   perfectly inelastic.
c.   unitary elastic.
d.   Cannot be determined from information given.
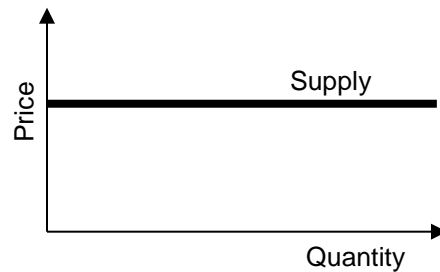
(5) In recent years, the demand for pork in East Asia has shifted right due to rising incomes there. Because pork is traded internationally, this should cause the price of pork in the United States to
a.   rise.
b.   fall.
c.   rise or fall, depending on the shapes of the demand and supply curves.
d.   remain constant.

(6) 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.

(7) Arbitrage guarantees that people in Denver and Chicago pay similar prices for
a.   houses.
b.   gold.
c.   haircuts.
d.   gravel.

(8) Suppose the price of a watermelon in Des Moines is $4 and the cost of shipping a watermelon between Des Moines and Minneapolis is $1.50. Markets are *in equilibrium* if the price of watermelons in Minneapolis is
a. $2.
b. $5.
c. $8.
d. $11.

(9) Consider the market for sandwiches depicted in the graph below. Suppose a law is passed prohibiting *sellers from selling* more than 200 sandwiches. With this quota, the price of sandwiches will be
a. $1.
b. $3.
c. $4.
d. $5.
e.   Cannot be determined from information given.
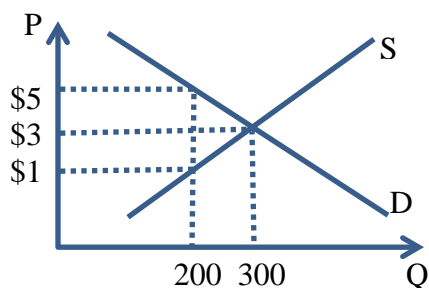
(10) A Laffer curve shows the relationship between
a.   quota quantities and quota price.
b.   deadweight loss and tax rates.
c.   quantity and price.
d.   consumer surplus and price.
e.   tax rates and tax revenues.

(11) Suppose the price elasticity of demand for baby food is -0.2 and the price elasticity of supply is 5.0. If a subsidy is given for baby food,
a.   Producers will enjoy most of the subsidy.
b.   Consumers will enjoy most of the subsidy.
c.   Producers and consumers will each enjoy half of the subsidy.
d.   Answer depends on which side receives the check from the government.

(12) Suppose the government subsidizes vitamins. The increase in consumer and producer surplus from this subsidy will necessarily be _____ the amount of money paid by the government to buyers or sellers of vitamins.
a.   less than.
b.   equal to.
c.   greater than.
d.   Cannot be determined.

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 movie admissions is $4, the typical consumer sees a movie three times a month. If the price is $8, the typical consumer sees a movie once a month. Compute the price elasticity of demand for movie admissions using the "arc-elasticity" formula.

(2) [Cross-price elasticity of demand: 8 pts] Use the information given below to determine whether each pair of goods (in *italics*) are substitutes or complements. Also compute the cross-price elasticity of demand. (Full credit requires correct sign.)

|	Substitutes or complements?	Computed cross-price elasticity
a. The price of orange juice rises by 25%, causing the quantity of apple juice purchased to rise by 5%.		
b. The price of air fares rises by 20%, causing the quantity of hotel rooms let to decrease by 5%.		

(3) [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 -0.6. Assume everything else affecting demand for water remains constant.

a. According to the information above, is demand for water service *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?   %

(4) [Using income elasticities: 10 pts] Suppose the income elasticity of demand for gasoline is 0.75. Now suppose income *rises* by 4%. Assume the price of gasoline does not change.

a. According to the information above, is gasoline a *necessary good*, an *inferior good*, or a *luxury (or superior) good*?

b. As income rises, will the quantity of gasoline demanded *increase*, *decrease*, or remain *constant*?

c. ... by about how much?   %

d. Will consumer spending on gasoline, as a fraction of a consumer's total budget, *increase*, *decrease*, or remain *constant*?

e. ... by about how much?   %

(5) [Welfare effects of international trade: 18 pts] Domestic supply and demand for ballcaps in a particular country are given by the following diagram.
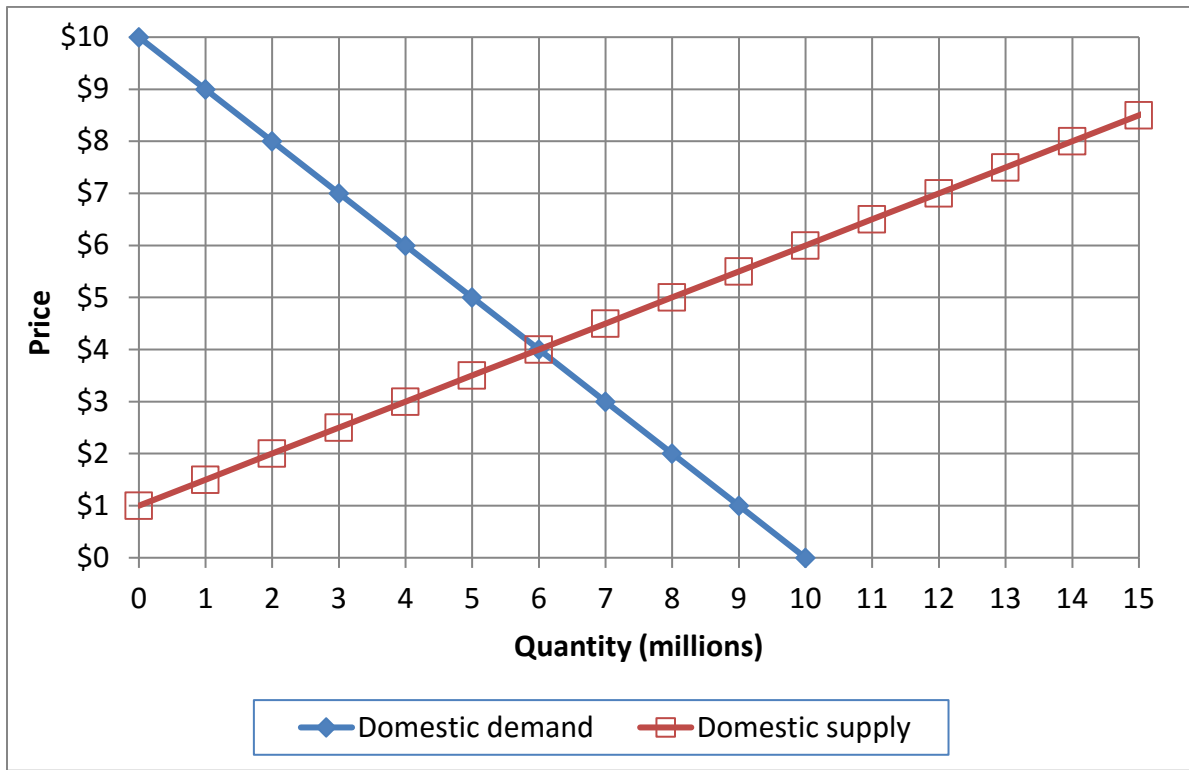
a. At first, international trade in ballcaps is not permitted. Find the equilibrium price without international trade.

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Then this industry is opened to international trade and the international price of ballcaps turns out to be **$ 6.**

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

c. How many?   million

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

e. By how much? $ million

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

g. By how much? $ million
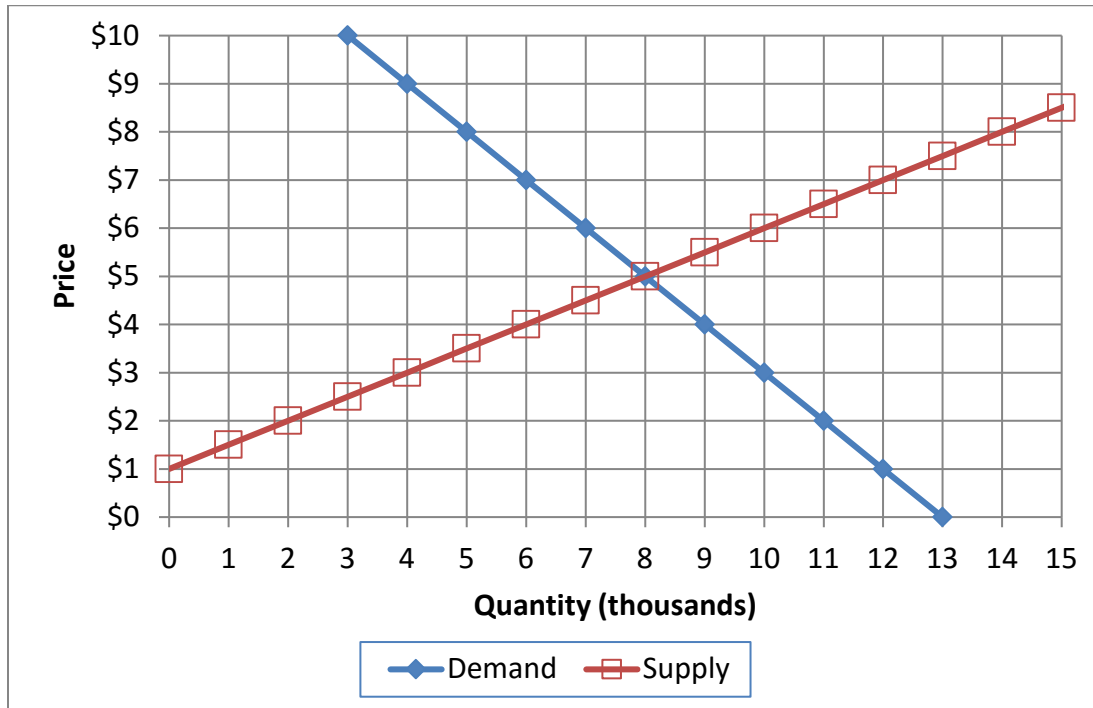
h. Does total social welfare in this country *increase or decrease* from international trade in ballcaps?

i. By how much? $ million

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

a. Find the equilibrium price without government intervention.

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Suppose the government imposes a price ceiling (or legal maximum price) of **$ 4**. No thumbdrives may be sold for a price greater than the price ceiling.

b. How many thumbdrives will actually be sold?

thousand

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

d. How much?

thousand

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?

$ thousand

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 thumbdrives are purchased by those consumers who are most willing to pay for them.)
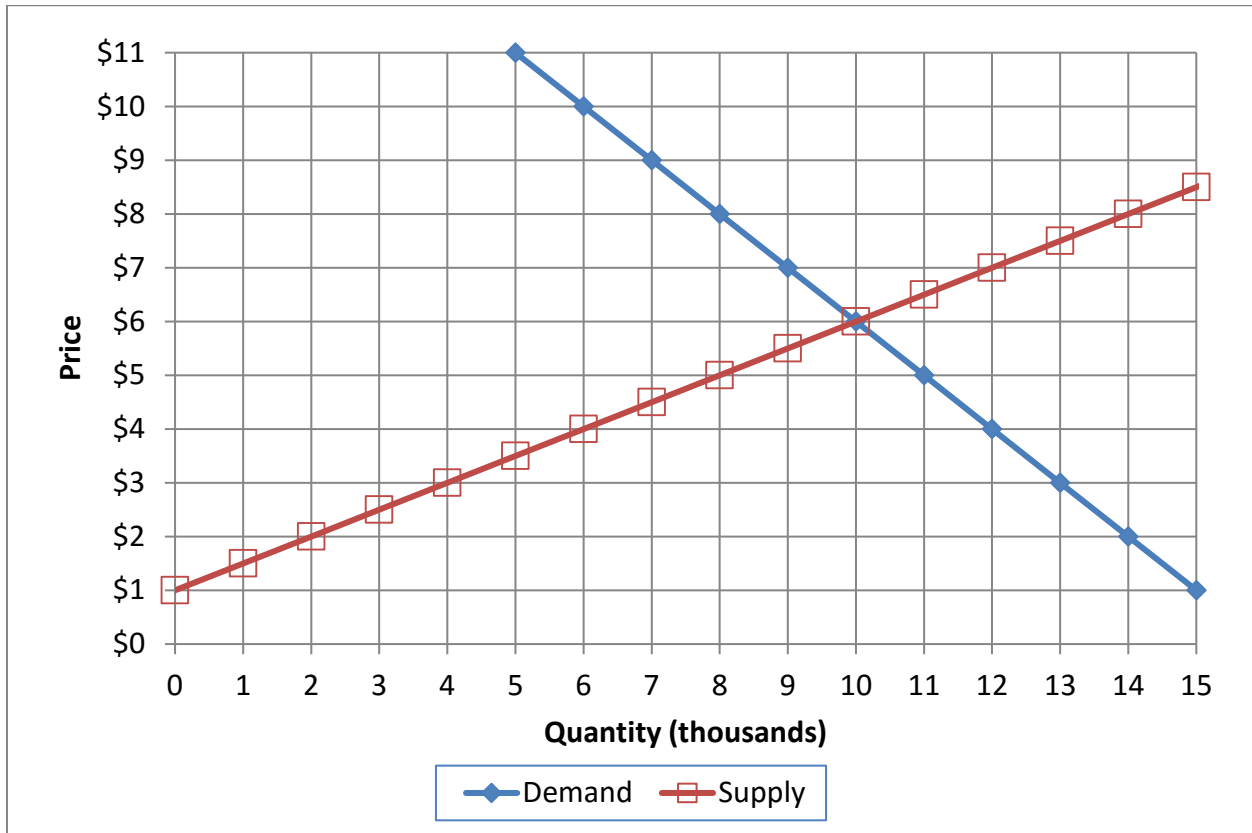
h. By how much?

$ thousand

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

$ thousand

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

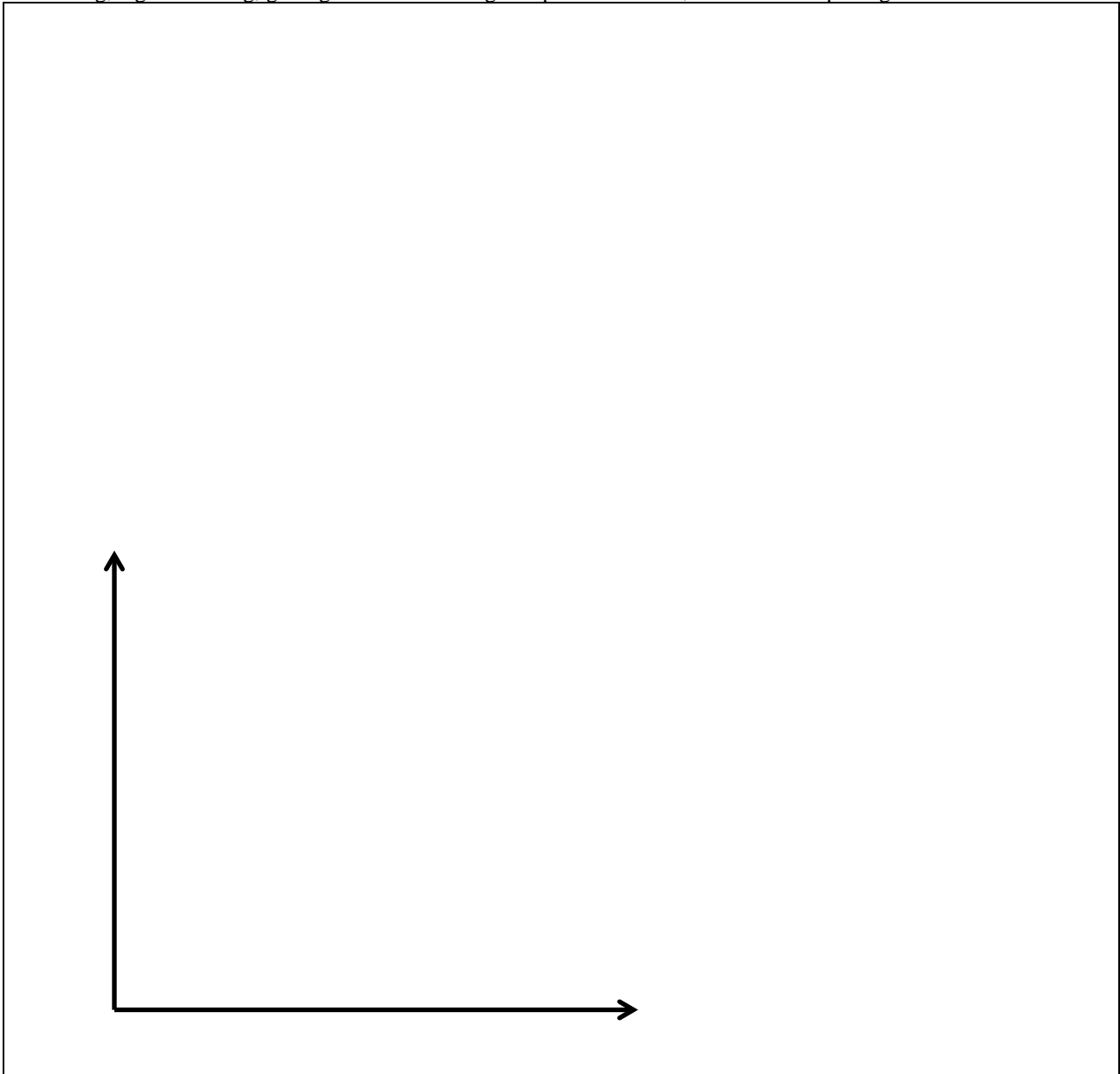Suppose the government imposes an excise **tax of $ 6** per snow shovel.

a. Compute the equilibrium quantity sold.

b. Compute the equilibrium net price received by sellers (excluding the tax).

c. Compute the equilibrium total price paid by buyers (including the tax).

d. Does producer surplus *increase, decrease,* or *remain constant* because of the tax?

e. By how much?

f. Does consumer surplus *increase, decrease,* or *remain constant* because of the tax?

g. By how much?

h. Compute the total tax revenue collected by the government.

i. Compute the deadweight social loss caused by the tax.

	thousand
$	per shovel
$	per shovel
$	thousand
$	thousand
$	thousand
$	thousand

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

(1) Suppose a tax of $3 is placed on calculators, and as a consequence, the number of calculators sold falls from 20 million to 16 million. 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 answer with a supply-and-demand graph, labelling all axes and curves.

(2) The price of petroleum is currently about $50 per barrel. A blogger says the price of petroleum will rise in the next three months to $200 per barrel. Do speculators agree with the blogger? Explain your answer. Assume the market is in equilibrium. (Ignore the 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]