

EXAMINATION 1 VERSION A
"Competitive Supply and Demand"
September 22, 2021

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.

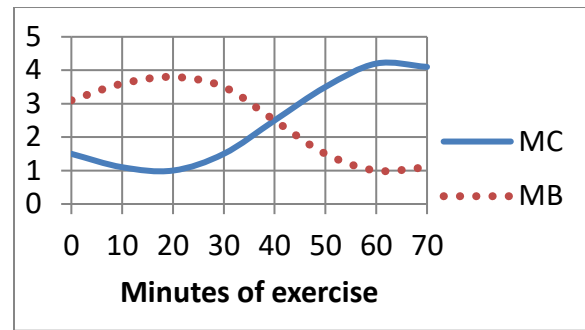
I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 28 pts total]

- (1) In economics, *rational behavior* means
- using math to make decisions.
 - ignoring "soft" concerns like friendships and charity.
 - doing the best one can with what one has.
 - making sacrifices today for a better future.
 - maximizing one's income.

- (2) Aaron buys a ticket to a football game for \$50. When he arrives at the stadium, he discovers that scalpers are willing to pay \$150 for his ticket. His *opportunity cost* of attending the game is
- \$0.
 - \$50.
 - \$100.
 - \$150.

- (3) Your *marginal benefit* of eating ice cream is
- the benefit of the first scoop you eat.
 - the benefit of the last scoop you eat.
 - the total benefit of all scoops you eat.
 - the average benefit of all scoops you eat.

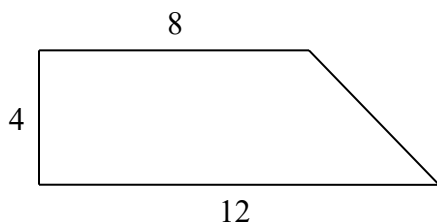
- (4) The graph below shows Amy's marginal cost (MC) and marginal benefit (MB) from cardio exercise at the gym. Amy's rational choice is to exercise for
- zero minutes.
 - 20 minutes.
 - 40 minutes.
 - 50 minutes.
 - 60 minutes.



- (5) In economics, an *equilibrium* is a situation where
- total costs equal total benefits.
 - no one wants to change their choices.
 - inflation equals zero percent.
 - economic growth is zero.
- (6) "The government should provide a job for everyone who wants one" is an example of
- a positive statement.
 - a normative statement.
 - both of the above.
 - none of the above.

(7) The area of the trapezoid below equals

- a. 32.
- b. 40.
- c. 48.
- e. 96.
- f. 384.



(8) Economic or physical capital includes

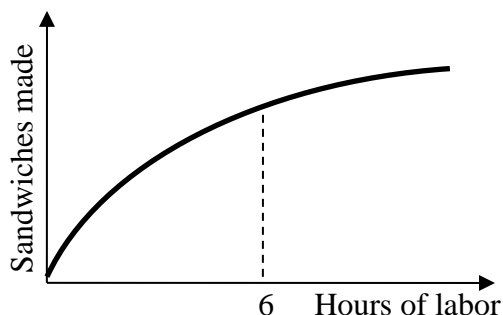
- a. bank accounts.
- b. shares of stock in corporations.
- c. bonds.
- d. all of the above.
- e. none of the above.

(9) A production function shows the relationship between the

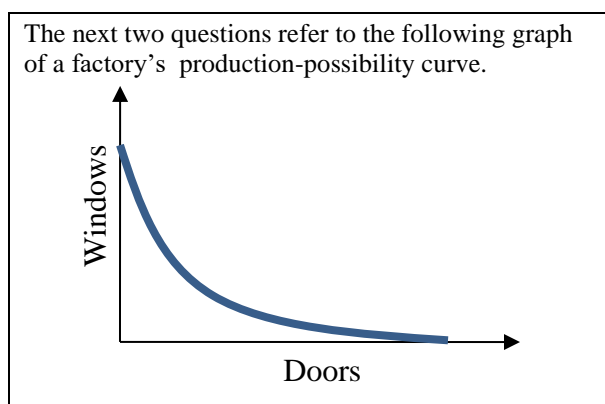
- a. level of output and the level of demand for output.
- b. price of output and the quantity produced.
- c. quantity of input and the quantity of output.
- d. current level of output and the past level of output.

(10) Is the production function below characterized by diminishing returns to labor input?

- a. Yes, for all levels of labor input.
- b. No, not for any levels of labor input.
- c. Yes, but only after 6 hours of labor input.
- d. Yes, but only before 6 hours of labor input.



The next two questions refer to the following graph of a factory's production-possibility curve.



(11) By definition, what is held constant along this production-possibility curve?

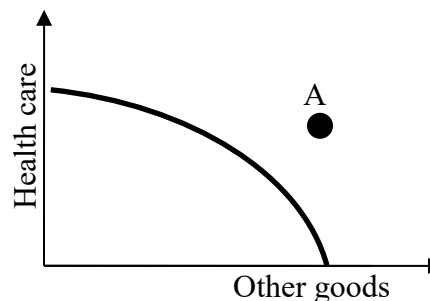
- a. The prices of windows and doors.
- b. Output of windows.
- c. Output of doors.
- d. The factory's total inputs.
- e. None of the above.

(12) As more doors are produced, the opportunity cost of the last door

- a. remains constant.
- b. decreases.
- c. increases.
- d. first increases, then decreases.

(13) The graph below shows the production possibility curve for some country. The combination of outputs represented by point A

- a. is feasible and efficient.
- b. is feasible but not efficient.
- c. is infeasible.
- d. cannot be determined from information given.



(14) Suppose Farmer A's opportunity cost of producing a bushel of soybeans is 2 bushels of corn, but Farmer B's opportunity cost of producing a bushel of soybeans is 3 bushels of corn. Which farmer has a comparative advantage in producing soybeans?

- a. Farmer A.
- b. Farmer B.
- c. both farmers.
- d. neither farmer.

(15) Monetary exchange is more common today than bartering because

- a. bartering is a lost art.
- b. monetary exchanges are subject to less tax.
- c. bartering requires a "double coincidence of wants."
- d. bartering is often illegal whereas anything can be legally bought and sold with money.

(16) The *law of one price* means that

- a. each buyer will pay her or his own price.
- b. each buyer will pay only once for a good.
- c. all buyers will pay roughly the same price.
- d. the prices of different goods—like cell phones and bicycles—will gradually converge to each other.

(17) The *law of demand* means that

- a. buyers will pay whatever price is necessary to purchase the good.
- b. the number of buyers must equal the number of sellers.
- c. the quantity that buyers want to buy is negatively related to the price.
- d. demand curves are necessarily straight lines.

(18) *Ceteris paribus* is a Latin phrase meaning

- a. "the Law of One Price."
- b. "assuming rational behavior."
- c. "holding other things constant."
- d. "comparative advantage."

(19) A shift in the demand curve for cars caused by a rise in consumers' incomes is called a

- a. change in marginal product.
- b. change in property rights.
- c. change in demand for cars.
- d. change in the quantity demanded of cars.

(20) A rise in the price of ice cream will shift the demand for frozen yogurt to the right, assuming ice cream and frozen yogurt are

- a. complementary goods.
- b. substitute goods.
- c. normal goods.
- d. inferior goods.

(21) As consumers' incomes rise, they typically go to more music concerts, because concerts are

- a. a substitute good.
- b. a complementary good.
- c. an inferior good.
- d. a normal good.

(22) The *law of supply* means

- a. the quantity that sellers want to produce and sell is positively related to the price.
- b. sellers can charge whatever price they want.
- c. a legal regulation that applies to sellers.
- d. there is always someone willing to sell a product.

(23) Spaghetti sauce is made from tomatoes, so if the price of tomatoes rises, then the

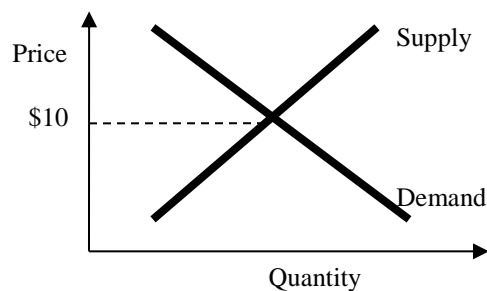
- a. demand for spaghetti sauce will shift left.
- b. demand for spaghetti sauce will shift right.
- c. supply of spaghetti sauce will shift left.
- d. supply of spaghetti sauce will shift right.

(24) Increased environmental regulations on the natural gas industry would

- a. shift the demand for natural gas to the right.
- b. shift the demand for natural gas to the left.
- c. shift the supply of natural gas to the right.
- d. shift the supply of natural gas to the left.

(25) Consider the supply-and-demand diagram below. If for some reason the price were \$7, then

- a. the price would fall.
- b. the price would rise.
- c. the demand curve would shift left.
- d. the supply curve would shift right.



(26) In September, the price of pears decreases and the quantity sold increases. This could be caused by

- a. rightward shift in the demand for pears.
- b. rightward shift in the supply of pears.
- c. leftward shift in the demand for pears.
- d. leftward shift in the supply of pears.

(27) Alyson is willing to pay \$800 for a smart phone, but fortunately the price is only \$500. If she buys a smart phone, her consumer surplus is

- a. zero.
- b. \$200.
- c. \$300.
- d. \$500.
- e. \$800.

(28) At any point on the supply curve for wheat, the height of the supply curve equals

- a. consumer surplus on that bushel of wheat.
- b. consumers' willingness to pay for that bushel of wheat.
- c. marginal cost of producing that bushel of wheat.
- d. producer surplus on that bushel of wheat.

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) [Percent change, midpoint formula: 2 pts] Suppose the average price of a cup of coffee in Des Moines is \$4 and the average price in New York is \$6. Compute the percent difference using the midpoint method.

%

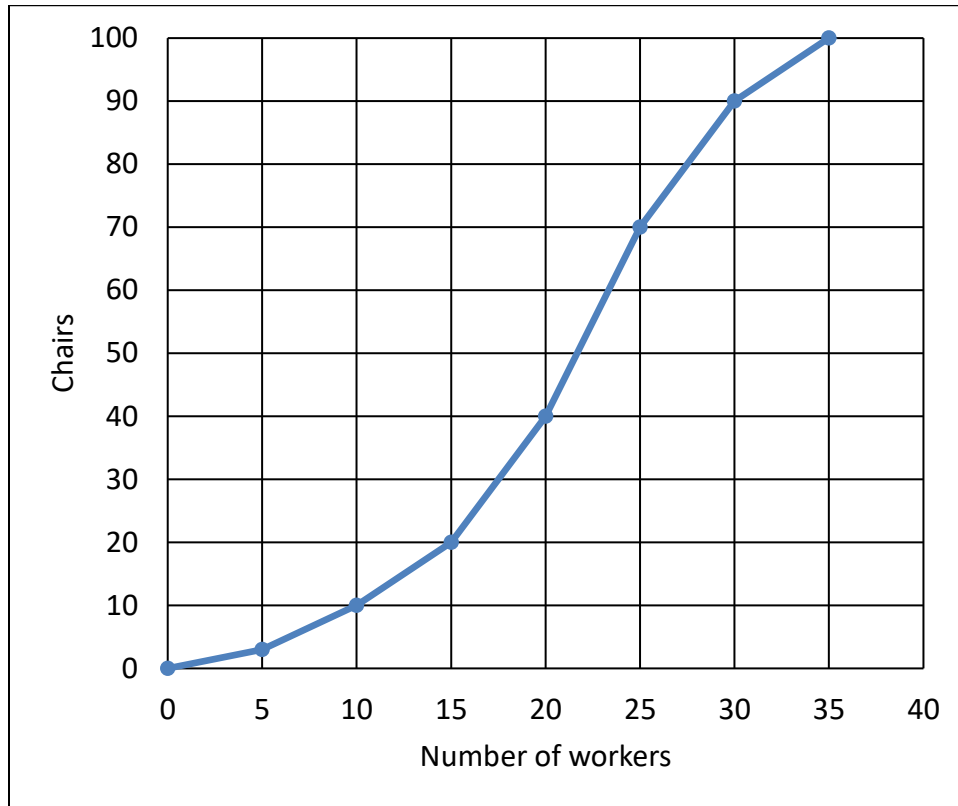
(2) [Percent change of product: 4 pts] Consumer spending on gasoline equals the price paid times the quantity purchased. Suppose the price of gasoline increases by 8 percent and the quantity purchased decreases by 2 percent.

a. Does spending on gasoline *increase* or *decrease*?

%

b. By approximately how much?

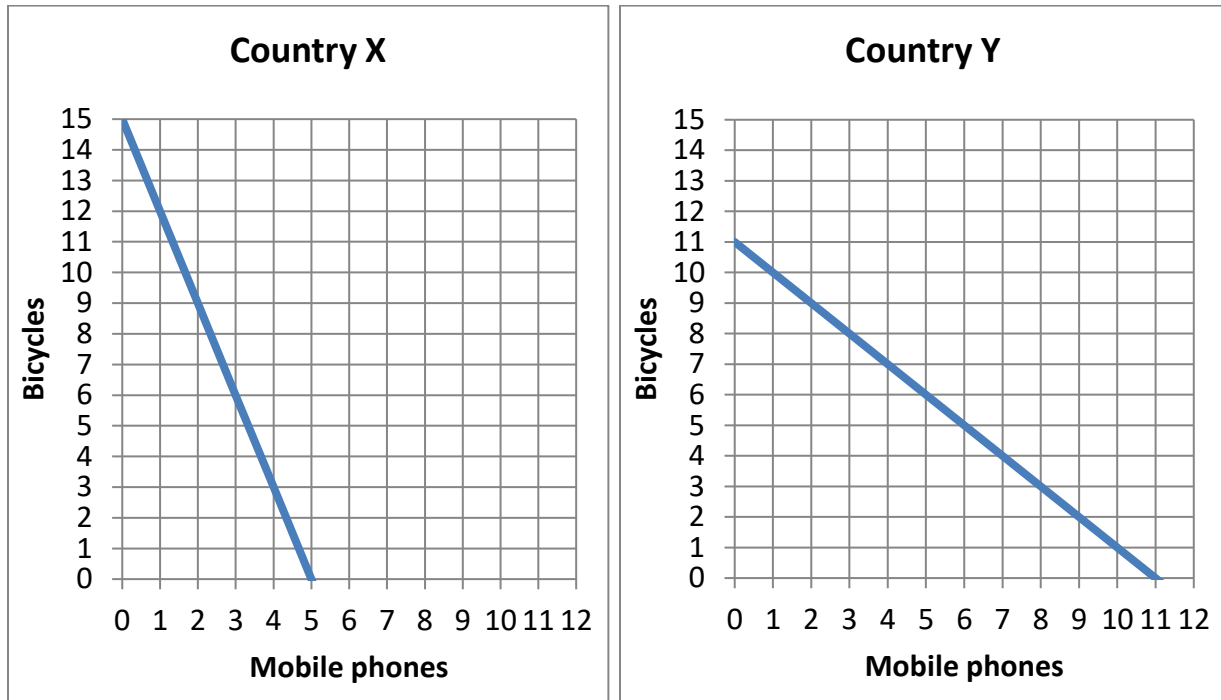
(3) [Production functions: 8 pts] Acme Chair Company has the hourly production function shown below.



- a. If the company employs 10 workers, what is their average product?
- b. If the company employs 30 workers, what is their average product?
- c. What is the marginal product of workers, as the number of workers increases from 10 to 15?
- d. What is the marginal product of workers, as the number of workers increases from 20 to 25?

chairs per worker
chairs per worker
chairs per worker
chairs per worker

(4) [Comparative advantage, gains from trade: 17 pts] Country X and Country Y can each produce bicycles and mobile phones. They each face a tradeoff between these two products because of limited workforces. Their production possibility curves are shown below.



- What is Country X's opportunity cost of producing a phone?
- What is Country Y's opportunity cost of producing a phone?
- What is Country X's opportunity cost of producing a bicycle?
- What is Country Y's opportunity cost of producing a bicycle?
- Which country has a comparative advantage in producing phones?
- Which country has a comparative advantage in producing bicycles?

	bicycles
	bicycles
	phones
	phones

g. [3 pts] Fill in the blanks: *Both* countries can consume combinations of products *outside* their individual production possibility curves if _____ exports *three* bicycles to _____, which exports _____ phones in return.

h. **Plot** the trade that you propose in part (g) on the graphs above. For each country, plot and label the starting point representing **production before trade**, and the ending point representing **consumption after trade**.

(5) [Shifts in demand and supply: 15 pts] Analyze each of the following markets according to the accompanying imaginary scenario.

a. Consider the market for **new houses**: The price of lumber rises.

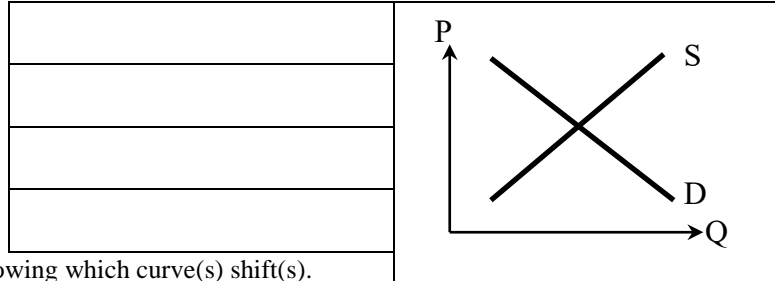
Does demand shift *left*, shift *right*, or remain *unchanged* ?

Does supply shift *left*, shift *right*, or remain *unchanged* ?

Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined* ?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



b. Consider the market for **Brussels sprouts**. Suppose a new government study is published, showing that eating Brussels sprouts every day can prevent cancer.

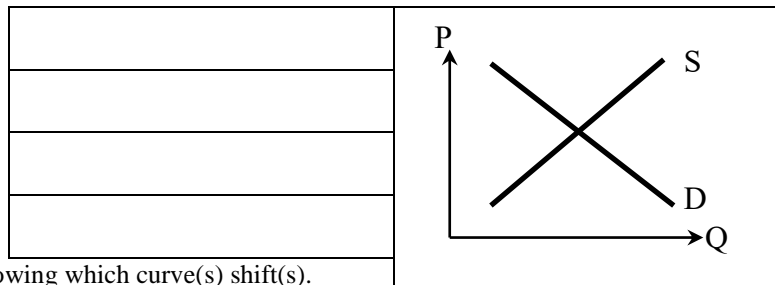
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Does supply shift *left*, shift *right*, or remain *unchanged* ?

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Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined* ?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



c. Consider the market for **coal**: Suppose new safety regulations raise the cost of digging coal. Simultaneously, the price of natural gas falls sharply.

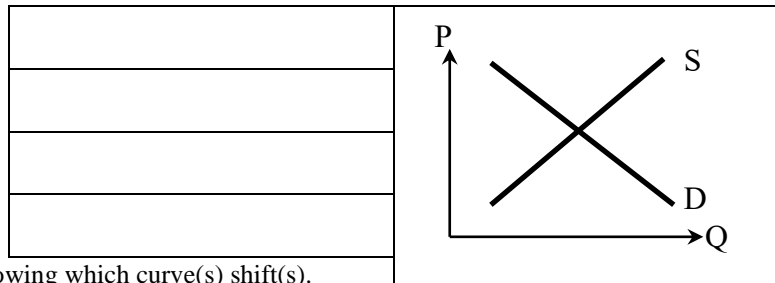
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Does supply shift *left*, shift *right*, or remain *unchanged* ?

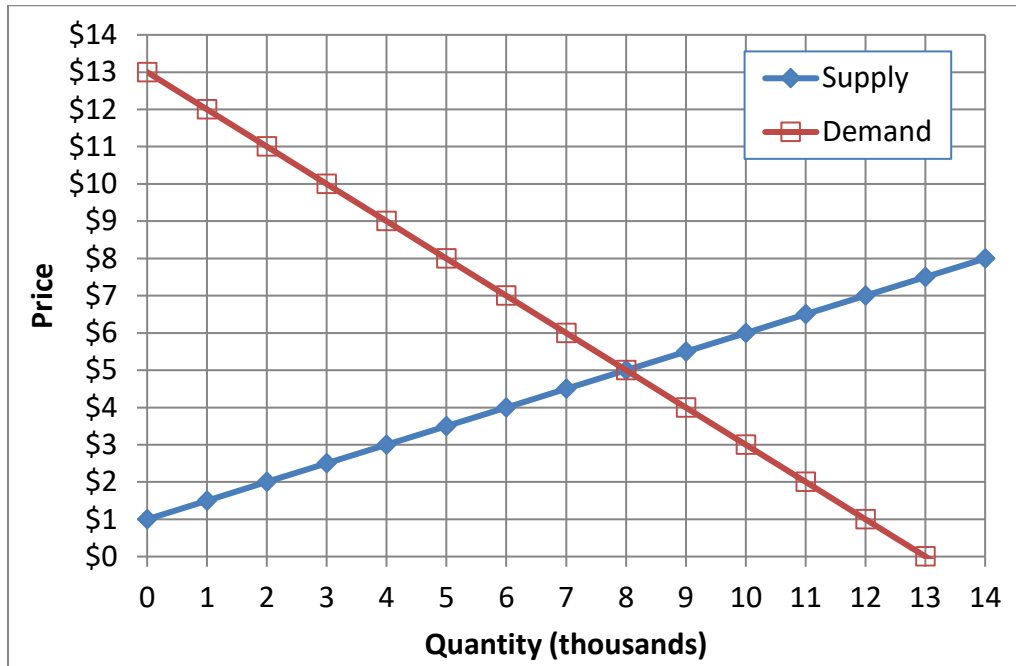
Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined* ?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



(6) [Consumer surplus, producer surplus: 22 pts] The market for sub sandwiches is depicted in the graph below.



Suppose the price in this market were \$3 for some unknown reason.

- Would there be *excess demand*, *excess supply*, or *neither*?
- How much?
- Would the price tend to *rise*, *fall*, or remain *constant*?

thousand

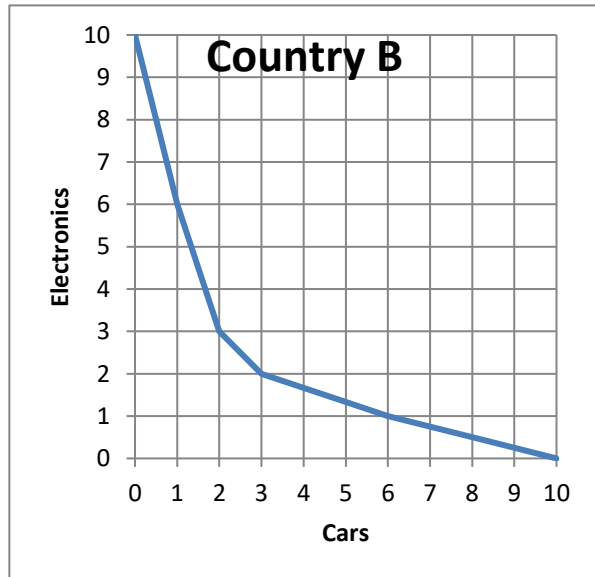
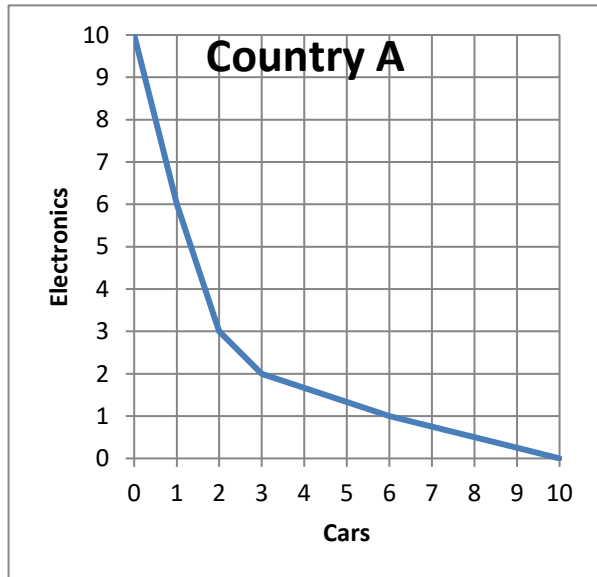
Now suppose the market is in *equilibrium*.

- What is the equilibrium price?
- What is the equilibrium quantity?
- How much are consumers willing to pay for the 3 thousandth sandwich?
- How much consumer surplus do they enjoy for the 3 thousandth sandwich?
- What is the marginal cost to producers of the 4 thousandth sandwich?
- How much producer surplus do they enjoy for the 4 thousandth sandwich?
- Compute total consumer surplus.
- Compute total producer surplus.

\$
thousand
\$
\$
\$
\$
\$
thousand
\$
thousand

III. Critical thinking: Write a one-paragraph essay answering the question below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling. [4 pts]

- (1) In this course, we have emphasized gains from trade based on *differences* in production possibility curves. Now consider the PP curves of two countries shown below, which are *identical*. Can both countries enjoy combinations of goods outside their individual PP curves through trade? If you answer NO, explain why not. If you answer YES, state verbally an example of a trade that puts both countries outside their individual PP curves, and plot that trade on the graphs.



[end of exam]