

EXAMINATION 1 VERSION A
"Competitive Supply and Demand"
February 21, 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, 15 pts total]

- (1) The assumption in economics that people are *rational* implies that people
- ignore "soft" concerns like friendships and charity.
 - do the best they can with what they have.
 - make sacrifices today for a better future.
 - maximize their income.
 - use math to make decisions.

- (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 now
- \$0.
 - \$50.
 - \$100.
 - \$150.

- (3) Rational choice implies pursuing an activity until the marginal benefit of the last unit
- is much greater than its marginal cost.
 - begins to exceed its marginal cost.
 - begins to fall below its marginal cost.
 - is much less than its marginal cost.

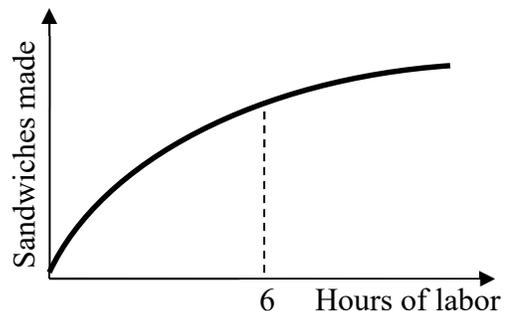
- (4) In economics, an *equilibrium* is a situation where
- total costs equal total benefits.
 - no one wants to change their choices.
 - inflation equals zero percent.
 - economic growth is zero.

- (5) "A tax cut should be enacted" is an example of
- a positive statement.
 - a normative statement.
 - both of the above.
 - none of the above.

- (6) Economic or physical capital includes
- bank accounts.
 - shares of stock in corporations.
 - bonds.
 - all of the above.
 - none of the above.

- (7) A production function shows the relationship between the
- level of output and the level of demand for output.
 - price of output and the quantity produced.
 - quantity of input and the quantity of output.
 - current level of output and the past level of output.

- (8) Is the production function below characterized by diminishing returns to labor input?
- Yes, for all levels of labor input.
 - No, not for any levels of labor input.
 - Yes, but only after 6 hours of labor input.
 - Yes, but only before 6 hours of labor input.



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

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

(10) The Law of One Price means

- a good cannot be resold.
- all sellers are required by law to quote the same price.
- the buyer and the seller in each transaction must agree on a price.
- efficient markets eliminate price dispersion.
- the total quantity buyers want to buy is negatively related to the price.

(11) A demand curve for laptop computers shows how the quantity of laptop computers people want to buy is affected by

- the laptop computer's features.
- the income of consumers.
- the price of laptop computers.
- the price of substitutes, like desktop computers.

(12) A fall in the price of Android smart phones will shift the demand for Apple iPhones to the left, since Android phones and iPhones are

- complementary goods.
- substitute goods.
- normal goods.
- inferior goods.

(13) The *law of supply* means

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

(14) Some people believe there is excess supply in the housing market. If they are right, then the price of houses can be expected to

- rise.
- fall.
- remain constant.
- Price movements are not related to excess supply.

(15) In spring, the price of winter coats decreases and the quantity sold also decreases. This could be caused by a

- rightward shift in the demand for winter coats.
- rightward shift in the supply for winter coats.
- leftward shift in the demand of winter coats.
- leftward shift in the supply of winter coats.

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) [Marginal cost: 2 pts] The breakfast menu at the Aliber Café includes “Two eggs, any style, \$5.50,” and “three eggs, any style, \$6.00. Compute the marginal cost of the third egg.

\$

(2) [Percent change, midpoint formula: 2 pts] Suppose the average home in State A uses 8 megawatt-hours of electricity per year, while the average home in State B uses 12 megawatt-hours per year. Compute the percent difference using the midpoint formula.

%

(3) [Percent change with multiplication: 4 pts] A gas station’s price for regular fuel decreases by six percent, while the quantity sold increases by two percent.

a. Does the gas station’s revenue for regular fuel *increase* or *decrease*?

--

b. By approximately how much?

%

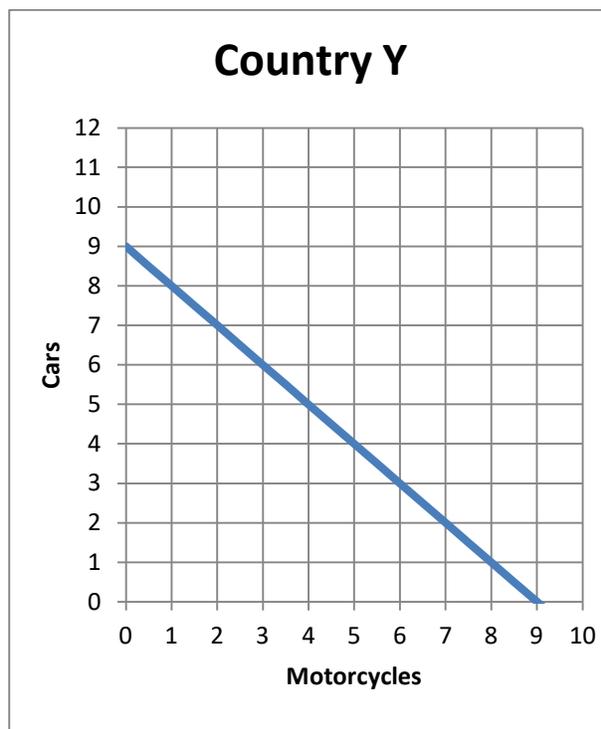
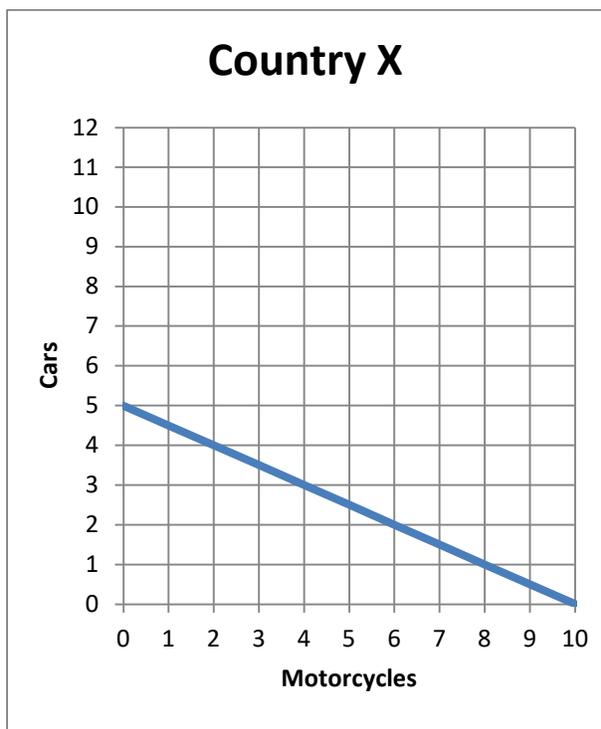
(4) [Production functions: 7 pts] A work crew plants trees. Complete the table by computing the work crew's average product and marginal product and placing your answers in the unshaded cells of the third and fourth columns below. Then answer the question below.

<i>Number of workers</i>	<i>Trees planted per day</i>	<i>Average Product</i>	<i>Marginal Product</i>
0 workers	0 trees		
			trees per worker
5 workers	25 trees	trees per worker	
			trees per worker
10 workers	40 trees	trees per worker	
			trees per worker
15 workers	45 trees	trees per worker	

Is the work crew's production function characterized by *diminishing returns* to their labor input? Answer YES or NO.

--

(5) [Comparative advantage, gains from trade: 17 pts] Country X and Country Y can each produce cars and motorcycles. 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 motorcycle?
- What is Country Y's opportunity cost of producing a motorcycle?
- What is Country X's opportunity cost of producing a car?
- What is Country Y's opportunity cost of producing a car?
- Which country has a comparative advantage in producing motorcycles?
- Which country has a comparative advantage in producing cars?

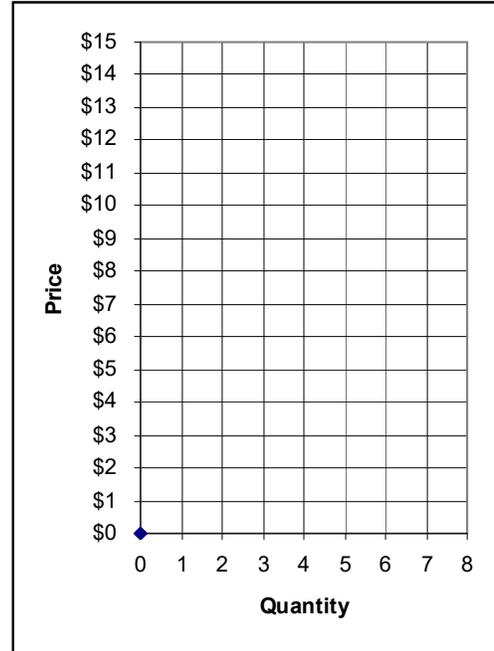
	cars
	cars
	motorcycles
	motorcycles

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

(6) [Market equilibrium: 12 pts] Suppose seven buyers and seven sellers engage in a market similar to the exercise we did in class. Each buyer may buy at most one unit and each seller may sell at most one unit, but no one is forced to trade. Assume that buyers and sellers are each trying to maximize their own surplus (or “gains from trade”). Surplus for each buyer equals the buyer's value of the good minus the price paid. Surplus for each seller equals the price received minus the seller's cost of the good. Surplus of persons who do not trade are zero. Buyers' values and sellers' costs are given in the following table.

<u>Buyer</u>	<u>Value</u>	<u>Seller</u>	<u>Cost</u>
Bob	\$14	Sue	\$ 1
Barb	\$13	Steve	\$ 2
Ben	\$12	Sam	\$ 3
Bailey	\$11	Sven	\$ 7
Brian	\$ 9	Sarina	\$11
Betty	\$ 3	Sean	\$12
Bert	\$ 1	Sally	\$13



Suppose with some experience, the market settles on a single price. All trades are made at that price. (Hint: use the graph at right for scratch work.)

- a. If the price were **\$6**, would there be *excess demand*, *excess supply*, or *neither*?

Now consider the market equilibrium.

- b. What is the equilibrium price? Give an answer to the nearest whole dollar.
- c. How many units of the good will be sold in this market?
- d. Compute the total revenue received by sellers (which equals the total spending by buyers).
- e. Compute the combined total surplus (or gains from trade) of all buyers and sellers. (Check your answer carefully! No partial credit for being "close"!)
- f. Who enjoys higher surplus in this particular market, the *buyers* or the *sellers*? Or is buyers' total surplus *equal* to sellers' total surplus?

\$	
	units
\$	
\$	

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

a. Consider the market for **apple juice**: The price of raw apples (from which juice is made) rises.

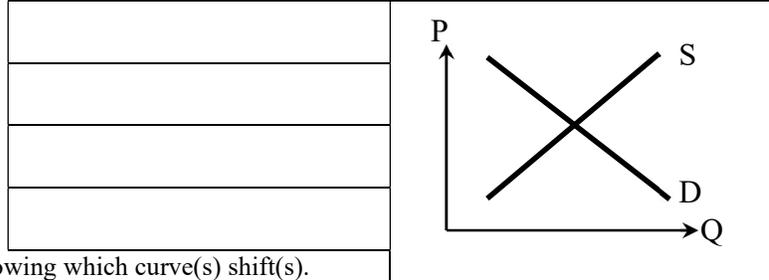
Does demand shift *left*, shift *right*, or remain *unchanged* ?

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 **natural gas**. Suppose we have an unusually cold winter. (Most homes in the Midwest are heated with natural gas.)

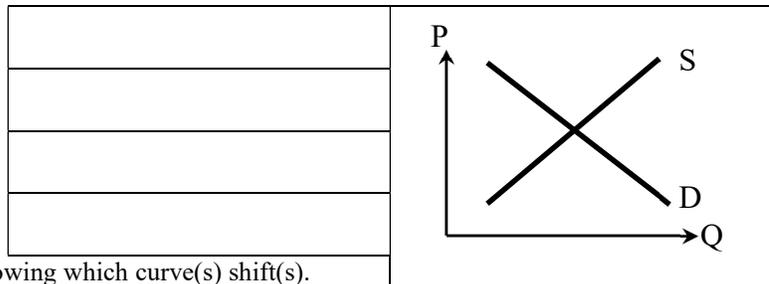
Does demand shift *left*, shift *right*, or remain *unchanged* ?

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).



c. Consider the market for **orange juice**: Suppose consumers begin shifting from fruit juices to water due to high sugar content in fruit juices. Simultaneously, a blight attacks orange trees.

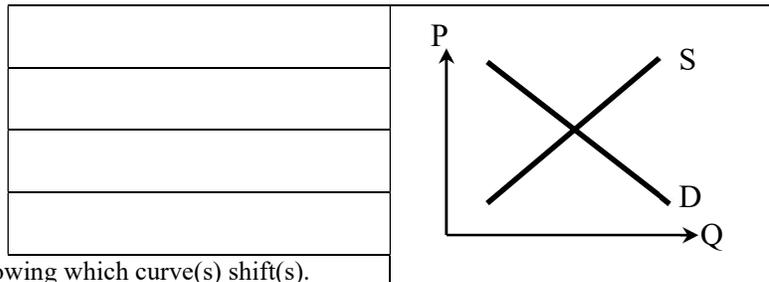
Does demand shift *left*, shift *right*, or remain *unchanged* ?

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).



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

(1) Consider the following statement. "The United States produces more cars and more corn than Mexico. Therefore, the United States cannot benefit from trade with Mexico in these goods." Assume the first sentence is correct. Do you agree or disagree with the second sentence? Justify your answer. (Ignore the graph.)

(2) Why are blueberries cheap in Iowa in summer, but expensive in winter? Justify your answer using a supply-and-demand graph, labeling all axes and 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]