

EXAMINATION 1 VERSION A
"Competitive Supply and Demand"
February 15, 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.

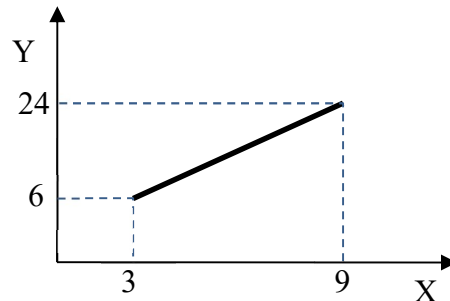
I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 20 pts total]

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

- (3) "Reducing inflation is more important than reducing unemployment" is an example of
- a positive statement.
 - a normative statement.
 - both of the above.
 - none of the above.

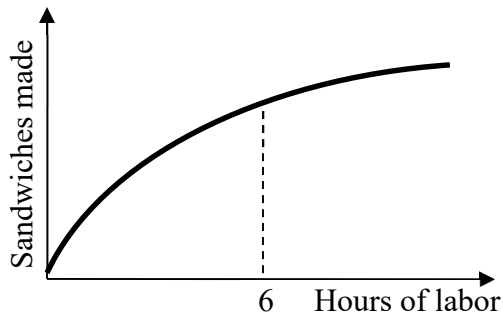
- (4) According to the graph below, the slope of the line segment equals
- 1.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.



- (5) 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.

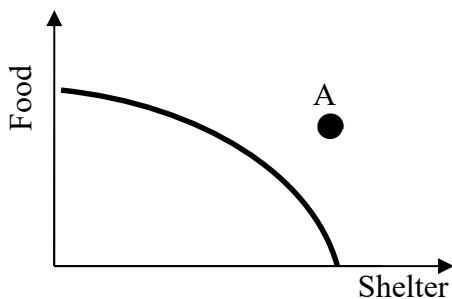
(6) Is the production function below characterized by diminishing returns to labor input?

- 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.



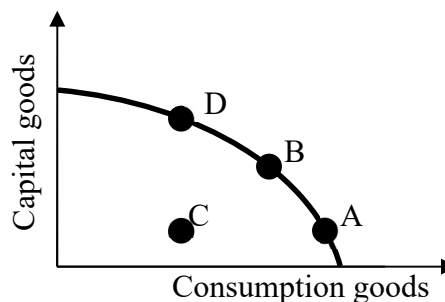
(7) The graph below shows the production possibility curve for some country. The combination of outputs represented by point A

- is feasible and efficient.
- is feasible but not efficient.
- is infeasible.
- cannot be determined from information given.



(8) The graph below shows the production possibility curve for Country Y. Which combination of outputs, chosen today, will cause the country's productive capacity to grow fastest in the future?

- Combination A.
- Combination B.
- Combination C.
- Combination D.



(9) 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?

- Farmer A.
- Farmer B.
- both farmers.
- neither farmer.

(10) Barter is an unpopular method of trading because it

- is subject to higher taxes.
- requires that each party be able to offer a good that the other wants.
- is often illegal.
- causes both parties to lose.
- all of the above.

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

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

(12) The *law of demand* means that

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

(13) As the price of smart phones falls, consumers are buying more apps to run on their smart phones, because smart phones and apps are

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

(14) A rise in consumers' income will shift the demand for hotel rooms to the right, because hotel rooms are

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

(15) 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. legal regulation of sellers.
- d. there is always someone willing to sell a product.

(16) Corn oil is made from corn, so if the price of corn rises, then the

- a. demand for corn oil will shift left.
- b. demand for corn oil will shift right.
- c. supply of corn oil will shift left.
- d. supply of corn oil will shift right.

(17) 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.

(18) Equilibrium in a competitive market occurs when

- a. the price is zero.
- b. the quantity demanded equals the quantity supplied.
- c. the price is affordable to most people.
- d. the revenue received by sellers is maximized.

(19) Excess supply in the market for wheat would cause the price of wheat to

- a. increase.
- b. decrease.
- c. oscillate up and down.
- d. remain constant.

(20) 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.

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) [Using slopes: 2 pts] Suppose that the slope of the curve relating X and Y , with X on the horizontal axis and Y on the vertical axis, is 2. That is $\Delta Y/\Delta X = 2$. Now suppose that X increases by 4 units.

a. Does Y increase or decrease?

b. By how much?

units

(2) [Percent changes: 2 pts] Income per capita in a country equals total income divided by the population. Suppose total income increases by 5 percent and population increases by 2 percent.

a. Does income per capita *increase* or *decrease*?

b. By approximately how much?

%

(3) [Percent change: 2 pts] Suppose that total output in a country is initially \$20 trillion. Then suppose output increases by 5 percent. Compute the new level of output.
 Compute the new level of output.

\$	trillion
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(4) [Marginal cost: 6 pts] The picture at right shows prices of ice cream sundaes at Baskin-Robbins.

- a. Compute the marginal cost of the first scoop of ice cream.
- b. Compute the marginal cost of the second scoop of ice cream.
- c. Compute the marginal cost of the third scoop of ice cream.

\$	
\$	
\$	



(5) [Economic capital: 6 pts] Which of the following are examples of *economic capital*? Answer YES or NO.

- | | |
|--|---|
| <ol style="list-style-type: none"> a. U.S. Treasury bonds. b. Corporate bonds. c. Bulldozers. | <ol style="list-style-type: none"> d. Computers and software. e. Savings accounts. f. Factory buildings. |
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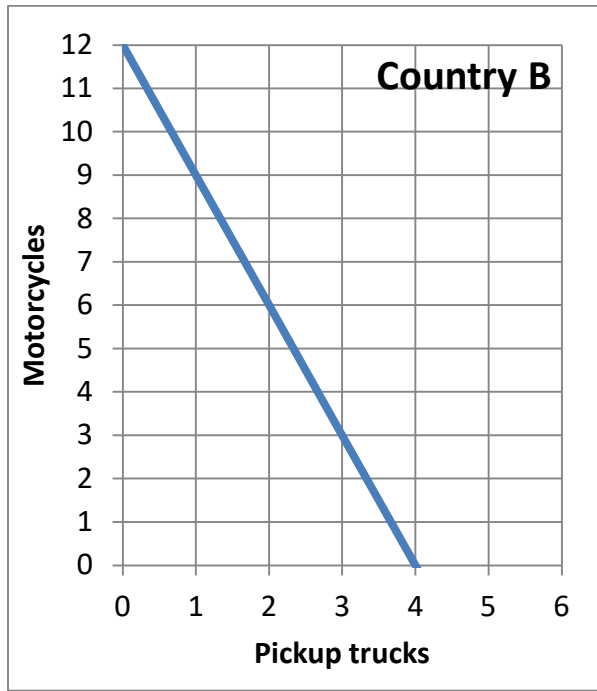
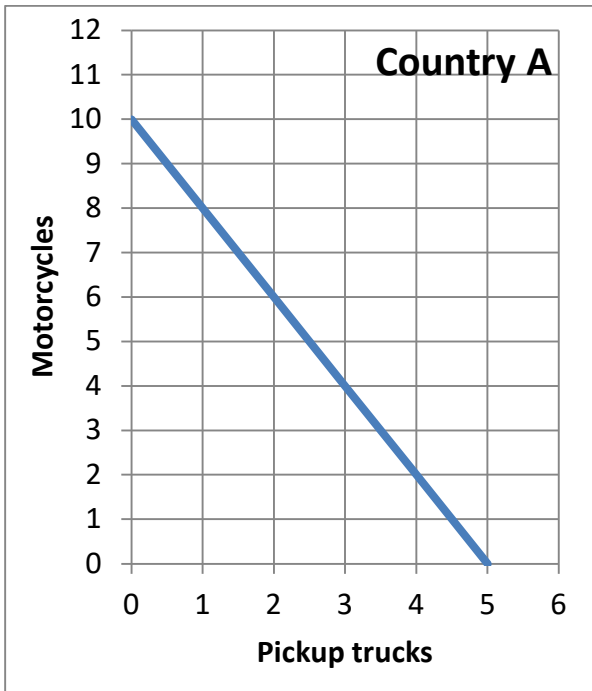
(6) [Production functions: 14 pts] A work crew plants trees. Complete the table by computing the work crew's average product and marginal product and placing your answers in the unshaded cells of the third and fourth columns below. Then answer the question below.

Number of workers	Number of trees planted	Average Product	Marginal Product
0 workers	0 trees		
			trees per worker
4 workers	20 trees	trees per worker	
			trees per worker
8 workers	32 trees	trees per worker	
			trees per worker
12 workers	36 trees	trees per worker	

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

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(7) [Comparative advantage, gains from trade: 17 pts] Country A and Country B can each produce motorcycles and pickup trucks. They each face a tradeoff between these two products because of limited workforces. Their production possibility curves are shown below.



- What is Country A's opportunity cost of producing a pickup truck?
- What is Country B's opportunity cost of producing a pickup truck?
- What is Country A's opportunity cost of producing a motorcycle?
- What is Country B's opportunity cost of producing a motorcycle?
- Which country has a comparative advantage in producing pickup trucks?
- Which country has a comparative advantage in producing motorcycles?

motorcycles
motorcycles
pickup trucks
pickup trucks

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

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

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

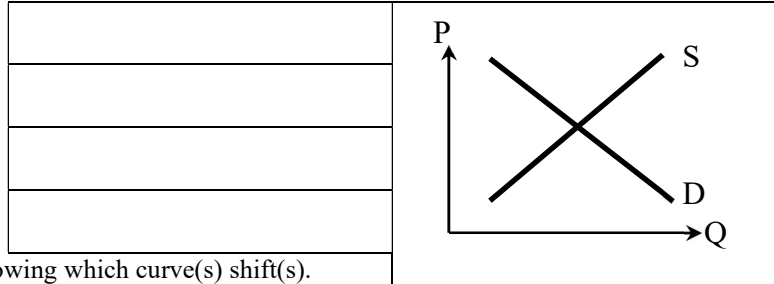
Does demand shift *left*, shift *right*, or remain *unchanged* ?

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).



b. Consider the market for **meat**. Suppose workers at meatpacking plants win a big increase in wages.

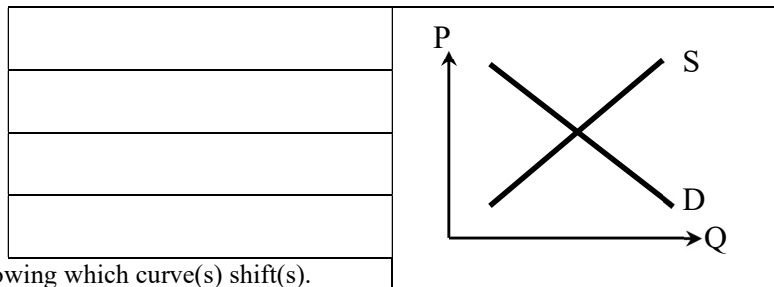
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Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

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 **new houses**: Suppose consumers' incomes rise. Simultaneously, the price of lumber increases sharply.

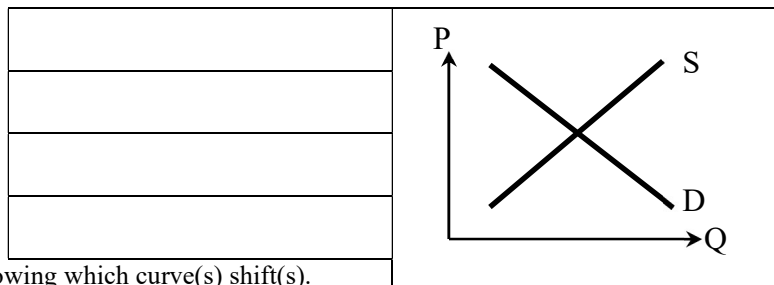
Does demand shift *left*, shift *right*, or remain *unchanged* ?

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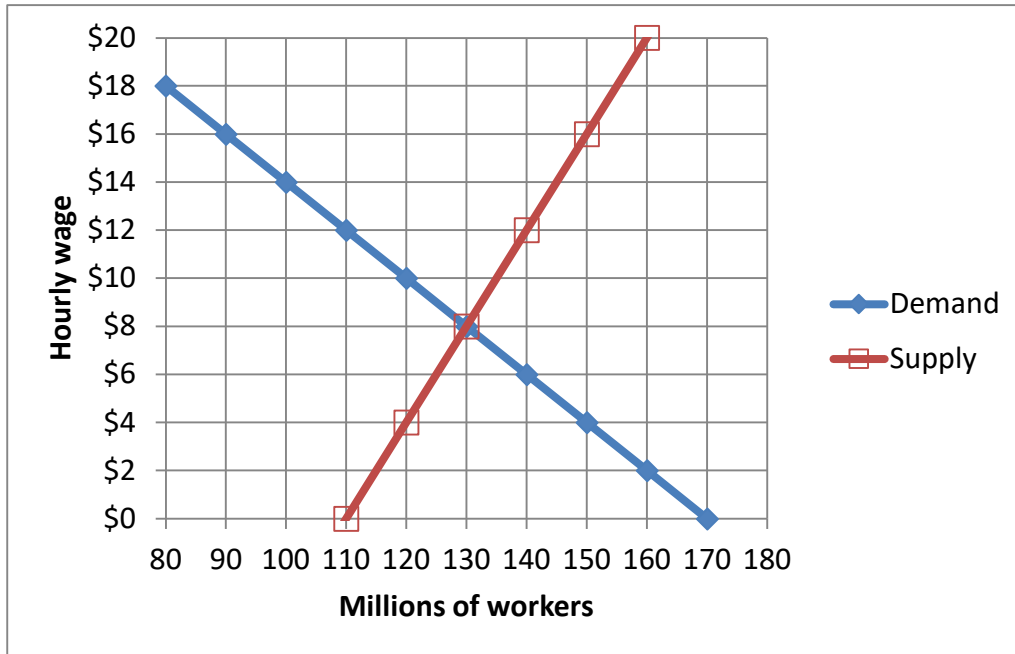
Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

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

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



(9) [Market equilibrium, price controls: 12 pts] The following graph shows the labor market. Note that the hourly wage is the price.



First, find the unregulated market equilibrium.

a. Find the equilibrium price.

\$	
	million

b. Find the equilibrium quantity.

Second, suppose the government imposes a minimum hourly wage (a type of price floor) of **\$ 12**. No worker may be hired for any lower wage.

c. Compute the quantity of workers demanded at this wage.

	million
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d. Compute the quantity of workers supplied at this wage.

	million
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e. Will there be *excess supply* or *excess demand* with this price floor?

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f. How much?

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

- (1) Consider the campus dining hall as a production process. What is the output of this production process? What are the labor inputs? What are the economic (or physical) capital inputs? What are the materials inputs (or intermediate inputs)? (Ignore the graph below.)
- (2) Why are restaurant meals expensive on Valentine's Day and cheap the day after? Justify your answer using a supply-and-demand graph, labeling all axes and curves.

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]