ECON 002 - Principles of Microeconomics
Drake University, Spring 2023
William M. Boal

Signature: _____

Printed name: _____

# EXAMINATION 1 VERSION B
# "Competitive Supply and Demand"
# February 16, 2023

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, 17 pts total]

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

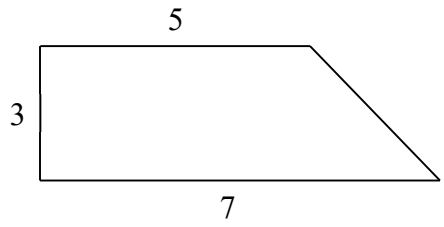
(2) Brian buys a ticket to a concert for $60. When he arrives at the concert hall, he discovers that scalpers are willing to pay $100 for his ticket. His *opportunity cost* of attending the concert is now
a. $40.
b. $60.
c. $100.
d. $160.

(3) A breakfast café charges $3.00 for one pancake, $4.00 for two pancakes, and $4.50 for three pancakes. What is the marginal cost of the *third* pancake?
a. $0.50.
b. $1.00.
c. $1.50.
d. $4.50.

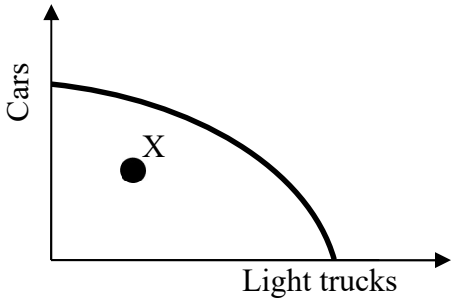
(4) Rational choice implies pursuing an activity until the marginal cost of the last unit
a. is much greater than its marginal benefit.
b. begins to exceed its marginal benefit.
c. begins to fall below its marginal benefit.
d. is as low as possible below its marginal benefit.

(5) "The government should keep interest rates low to support the housing industry" is an example of
a. a positive statement.
b. a normative statement.
c. both of the above.
d. none of the above.

(6) The area of the trapezoid below equals
a. 3.
b. 15.
c. 18.
d. 21.
e. 35.




(7) The graph below shows the production possibility curve for some factory. The combination of outputs represented by point X
a. is feasible and efficient.
b. is feasible but not efficient.
c. is infeasible.
d. cannot be determined from information given.



(8) Economic or physical capital includes
a. trucks and bulldozers.
b. machinery and equipment.
c. factories and office buildings.
d. all of the above.
e. none of the above.

The next three questions refer to the following information. Farm X can produce 10 units of tomatoes or 20 units of peppers per acre. Farm Y can produce 30 units of tomatoes or 30 units of peppers per acre.

(9) What is Farm X's opportunity cost of a unit of peppers?
a. 0.5 units of tomatoes.
b. 2 units of tomatoes.
c. 10 units of tomatoes.
d. 2 units of peppers.

(10) What is Farm Y's opportunity cost of a unit of peppers?
a. 1 unit of tomatoes.
b. 2 units of tomatoes.
c. 10 units of tomatoes.
d. 30 units of peppers.

(11) Which farm has a comparative advantage in peppers?
a. Farm X.
b. Farm Y.
c. Both farms.
d. Neither farm.

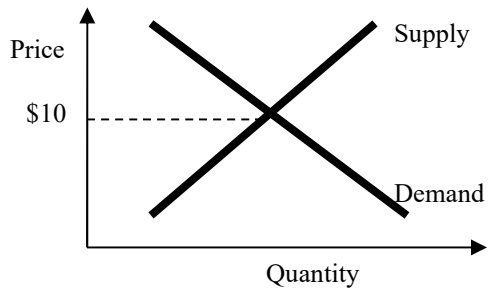
(12) The Law of One Price means
a. efficient markets eliminate price dispersion.
b. the total quantity buyers want to buy is negatively related to the price.
c. a good cannot be resold.
d. all sellers are required by law to quote the same price.
e. the buyer and the seller in each transaction must agree on a price.

(13) If the price of milk rises, and nothing else affecting the demand for milk changes, then this will cause
a. the demand curve for milk to rotate clockwise until it becomes upward-sloping.
b. a movement along the demand curve for milk, up and to the left.
c. a movement along the demand curve for milk, down and to the right.
d. the demand curve for milk to shift left.
e. the demand curve for milk to shift right.

(14) 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.

(15) A rise in people's incomes will shift the demand for Ramen noodles to the left, if Ramen noodles are
a. a complementary good.
b. a substitute good.
c. a normal good.
d. an inferior good.

(16) Consider the supply-and-demand diagram below. If for some reason the price were $15, 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.




(17) In autumn, the price of watermelon rises and the quantity sold decreases. This could be caused by a
a. rightward shift in the demand for watermelon.
b. rightward shift in the supply of watermelon.
c. leftward shift in the demand for watermelon.
d. leftward shift in the supply of watermelon.

**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 bus fare in City A is $3 and bus fare in City B is $5. Compute the percent difference using the midpoint method, to the nearest tenth of a percentage point.

%

(2) [Percent change of product: 4 pts] Consumer spending on gasoline equals the price paid times the quantity purchased. Suppose the price of gasoline decreases by 5 percent and the quantity purchased increases by 2 percent.

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

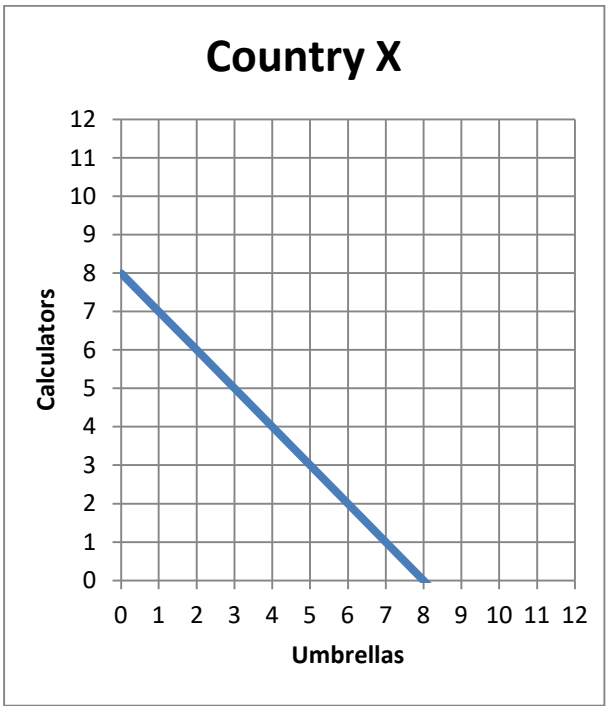
b. By approximately how much? %

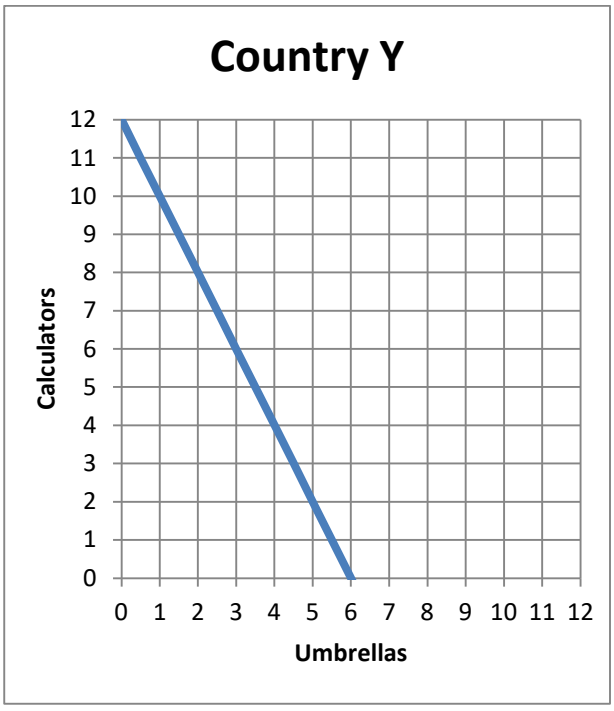
(3) [Production functions: 7 pts] A work crew reroofs houses. Complete the table by computing the work crew's average product and marginal product and placing your answers in the unshaded cells of the third and fourth columns below. Then answer the question below.

| *Number of workers* | *Houses reroofed per month* | *Average Product* | *Marginal Product* |
|---|---|---|---|
| 0 workers | 0 houses | | |
| | | | houses per worker |
| 3 workers | 18 houses | houses per worker | |
| | | | houses per worker |
| 6 workers | 24 houses | houses per worker | |
| | | | houses per worker |
| 9 workers | 27 houses | houses per worker | |

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

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




a. What is Country X's opportunity cost of producing an umbrella? calculators

b. What is Country Y's opportunity cost of producing an umbrella? calculators

c. What is Country X's opportunity cost of producing a calculator? umbrellas

d. What is Country Y's opportunity cost of producing a calculator? umbrellas

e. Which country has a comparative advantage in producing umbrellas?

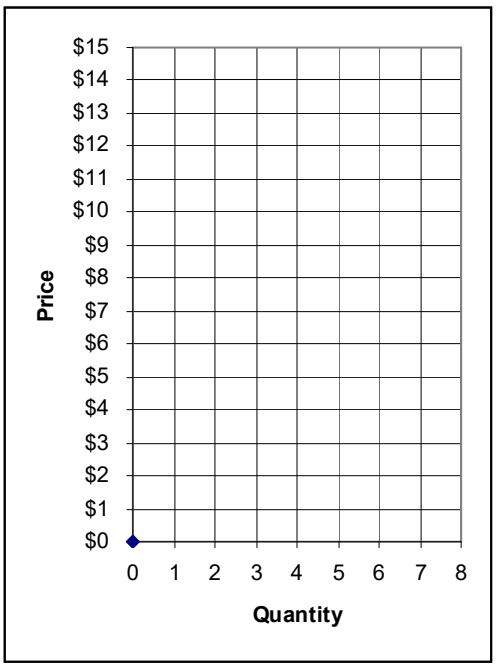
f. Which country has a comparative advantage in producing calculators?

g. [3 pts] Fill in the blanks: *Both* countries can consume combinations of products *outside* their individual production possibility curves if _____ exports *two* umbrellas to _____, which exports _____ calculators 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) [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 personal 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.

| *Buyer* | *Value* | *Seller* | *Cost* |
|---|---|---|---|
| *Bob* | $14 | *Sue* | $ 1 |
| *Barb* | $13 | *Steve* | $ 2 |
| *Ben* | $12 | *Sam* | $ 3 |
| *Bailey* | $11 | *Sven* | $ 4 |
| *Brian* | $ 4 | *Sarina* | $ 6 |
| *Betty* | $ 3 | *Sean* | $14 |
| *Bert* | $ 1 | *Sally* | $15 |




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 $12, would there by *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? units

d. Compute the total revenue received by sellers (which equals the total spending by buyers). $

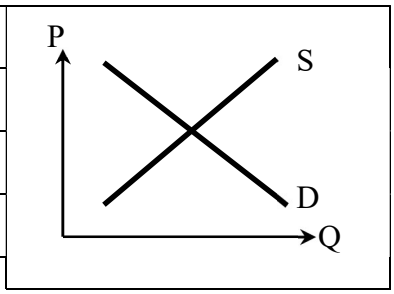
e. Compute the combined total surplus (or gains from trade) of all buyers and sellers. (Check your answer carefully! No partial credit for being "close"!) $

f. Who enjoys higher surplus in this particular market, the *buyers* or the *sellers?* Or is buyers' total surplus *equal* to sellers' total surplus?

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

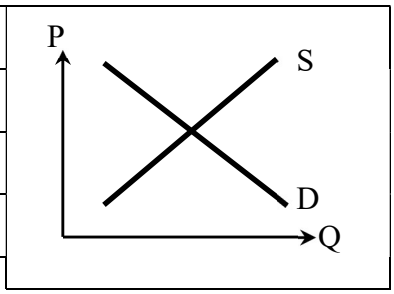
a. Consider the market for ***high-efficiency light bulbs***. Suppose new technology allows these bulbs to be manufactured at much lower cost.

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).



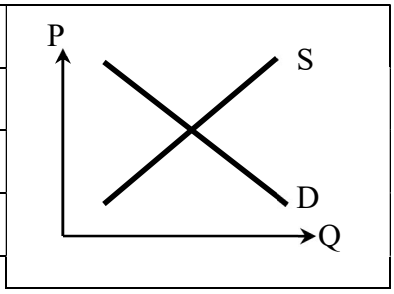

b. Consider the market for ***chicken***: Suppose the price of beef rises.

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).

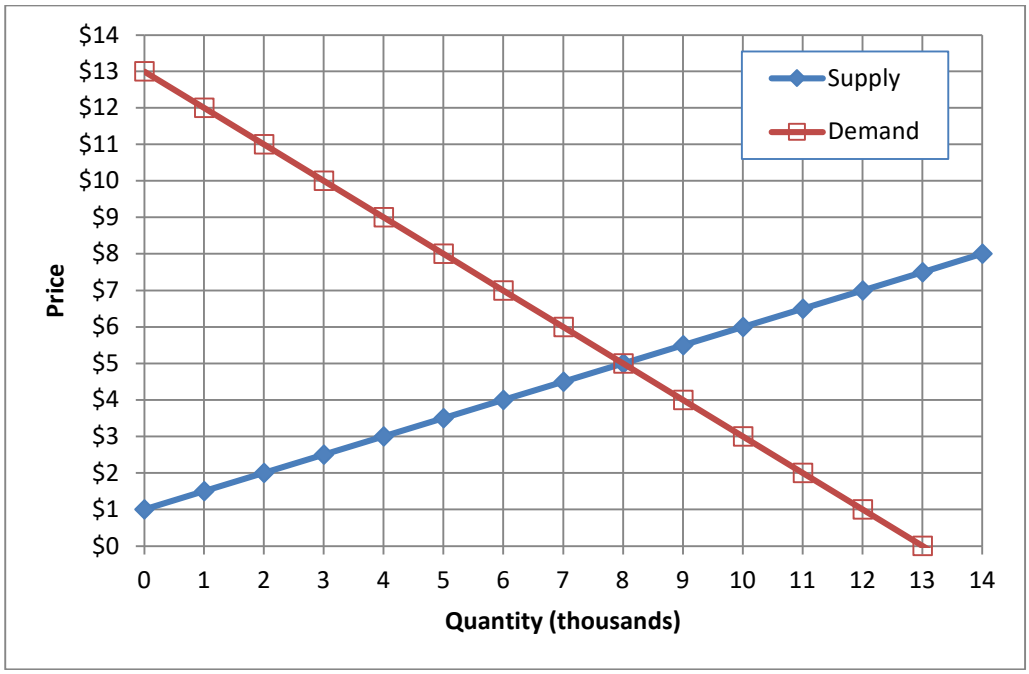



c. Consider the market for ***cotton clothing***: A new fashion trend favors natural fibers like cotton. Simultaneously, a blight raises the price of raw cotton.

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).



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




Suppose the price in this market were \$2 for some reason.

a. Would there be *excess demand, excess supply*, or *neither*?

b. How much? thousand

c. Would the price tend to *rise, fall*, or remain *constant*?

Now suppose the market is in equilibrium.

d. What is the equilibrium price? \$

e. What is the equilibrium quantity? thousand

f. How much are consumers willing to pay for the 4 thousandth cantaloupe? \$

g. How much consumer surplus do they enjoy for the 4 thousandth cantaloupe? \$

h. What is the marginal cost to producers of the 2 thousandth cantaloupe? \$

i. How much producer surplus do they enjoy for the 2 thousandth cantaloupe? \$

j. Compute total consumer surplus. \$ thousand

k. Compute total producer surplus. \$ thousand

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

(1) 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.

(2) Consider the following statement. "They are building too many hotels in this city. All the hotels will be half full, so they will raise their prices just to stay profitable. In the end, the consumer will suffer from higher prices." Does this argument make sense? Why or why not? 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]