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

Signature: _____

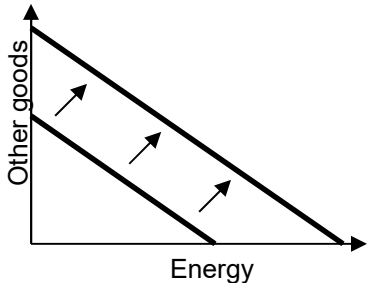
Printed name: _____

EXAMINATION 3 VERSION A
"Choices Underlying Supply and Demand"
November 6, 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. Point values for each question are noted in brackets. Maximum total points are 100.

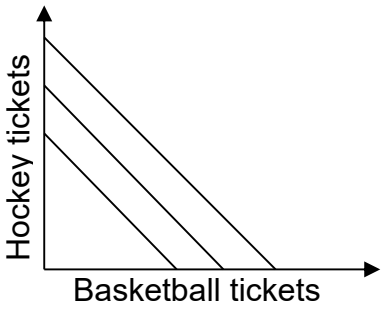
I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 14 pts total]

(1) In the graph below, the shift in the budget line could be caused by
a. an increase in income.
b. a decrease in income.
c. an increase in the price of energy.
d. a decrease in the price of energy.
e. an increase in the price of other goods.
f. a decrease in the price of other goods.



(2) If two bundles are on the same indifference curve, then they
a. cost the same amount.
b. are equally preferred by the consumer.
c. include identical amounts of all goods.
d. are equally affordable.

(3) The indifference-curve graph below shows Barbara's preferences. The graph reveals that, for Barbara, hockey tickets and basketball tickets are
a. perfect squares.
b. perfect substitutes.
c. perfect complements.
d. perfectly elastic.



(4) Production of lithium batteries is increasing. An increase in the number of companies who produce lithium batteries is called a change at the
a. extensive margin.
b. intensive margin.
c. marginal product.
d. marginal revenue.

(5) Which of the following is an economic cost but not an accounting cost?
a. Payments for electricity, raw materials, and supplies.
b. Lease payments for equipment and buildings.
c. The opportunity cost of the business owner's time spent running the business.
d. Wages paid to workers.
e. All of the above.

(6) The increase in a firm's total revenue from producing and selling one more unit of output by definition equals the firm's
a. total revenue.
b. average revenue.
c. marginal revenue.
d. total cost.
e. average cost.
f. marginal cost.

(7) All money paid by a firm for inputs equals by definition the firm's
a. total revenue.
b. average revenue.
c. marginal revenue.
d. total cost.
e. average cost.
f. marginal cost.

(8) The slope of the firm's total cost curve by definition equals the firm's
a. total revenue.
b. average revenue.
c. marginal revenue.
d. total cost.
e. average cost.
f. marginal cost.

(9) A firm's total cost divided by its total output by definition equals the firm's
a. total revenue.
b. average revenue.
c. marginal revenue.
d. total cost.
e. average cost.
f. marginal cost.

(10) If a firm takes the market price as given, its *marginal revenue* curve is
a. a downward-sloping line.
b. a horizontal line.
c. an upward-sloping line through the origin.
d. a downward-sloping curve with increasing slope.
e. an upward-sloping curve with decreasing slope.

(11) A small firm in a big market maximizes its profit by
a. adjusting its price so that price equals marginal cost.
b. adjusting its output quantity so that price equals marginal cost.
c. shifting its marginal cost curve up or down so that price equals marginal cost at its desired output level.
d. all of the above.

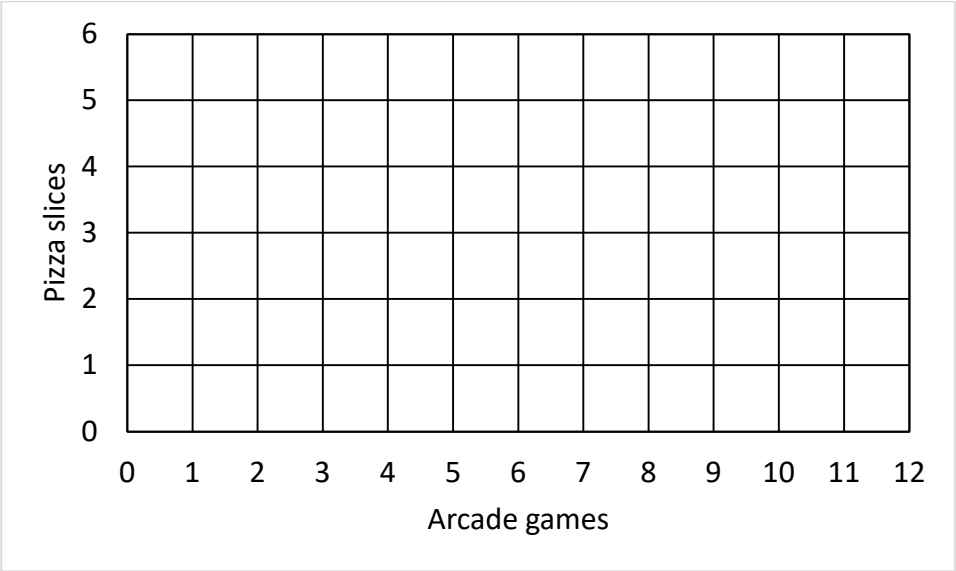
(12) In the *short run*, a firm should continue operating if its revenue is sufficient to pay at least its
a. fixed cost.
b. variable cost.
c. total cost.
d. accounting cost.

(13) The formula for discounting shows that the present discounted value of $100 to be received in the future is *greater,*
a. the lower the interest rate (or discount rate).
b. the higher the interest rate.
c. Present discounted value is not affected by the interest rate.
d. Cannot be determined from the information given.

(14) *Price equals average cost* in a competitive industry in long-run equilibrium because
a. business owners have a sense of fairness.
b. individual firms adjust their output levels using the rule "price equals average cost" to maximize profit.
c. consumers refuse to pay more than what is reasonable.
d. positive profits encourage entry of new firms while negative profits encourage existing firms to leave the industry.
e. the threat of government regulation causes firms to hold prices down.

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) [Consumer's budget constraint: 10 pts] Ava has **$20** to spend on arcade games and pizza slices. The price of pizza slices is **$4.** The price of arcade games is **$2.**



a. **Using a straightedge**, carefully draw Ava's budget line

Determine whether the following combinations of goods are *exactly affordable, affordable with money left over,* or *not affordable* for Ava.

b. 3 pizza slices and 5 arcade games.

c. 1 pizza slice and 7 arcade games.

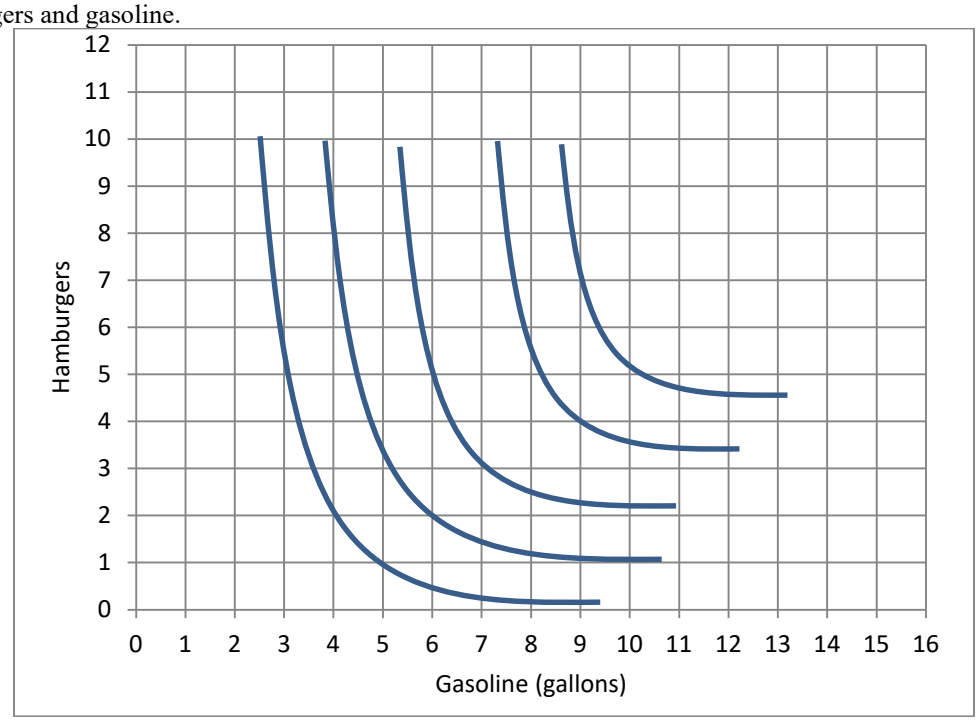
d. 2 pizza slices and 6 arcade games.

Assume that Ava spends all her income on arcade games and pizza slices.

e. What is Ava's opportunity cost of an arcade game?

pizza slices

(2) [Consumer choice and demand: 14 pts] The indifference curves in the graph below represent Beto's preferences for hamburgers and gasoline.



a. Would Beto rather have 2 hamburgers and 6 gallons of gasoline, or 6 hamburgers and 3 gallons of gasoline?

hamburgers	and		gallons of gasoline

b. Would Beto rather have 5 hamburgers and 6 gallons of gasoline, or 8 hamburgers and 4 gallons of gasoline?

hamburgers	and		gallons of gasoline

Suppose Beto has a budget of $30 to spend on hamburgers and gasoline. The price of hamburgers is $3.

c. **Using a straightedge**, carefully draw Beto's budget line when the price of gasoline is $2 per gallon. Label this budget line "A".

d. How much gasoline will Beto buy if the price of gasoline is $2?

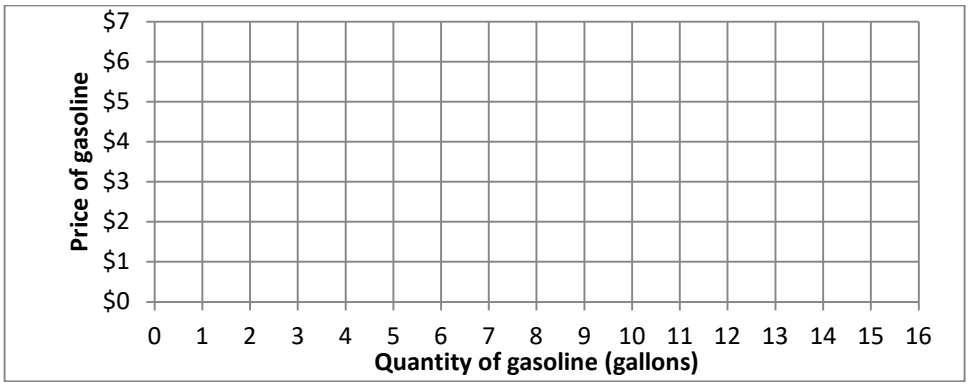
	gallons

e. **Using a straightedge**, carefully draw Beto's budget line when the price of gasoline is $6 per gallon. Label this budget line "B".

f. How much gasoline will Beto buy if the price of gasoline is $6?

	gallons

g. Plot two points on Beto's demand curve for gasoline, and sketch his demand curve at right.



(3) [Rational choice: 10 pts] A state government is considering building a sea wall to protect homes and businesses from rising sea levels. The following are cost and benefit estimates for walls of different lengths.

Miles	Total cost	Total benefit	Marginal cost per mile	Marginal benefit per mile
0	$ 0	$0		
			$ million	$ million
5	$30 million	$50 million		
			$ million	$ million
10	$50 million	$100 million		
			$ million	$ million
15	$90 million	$120 million		
			$ million	$ million
20	$140 million	$130 million		

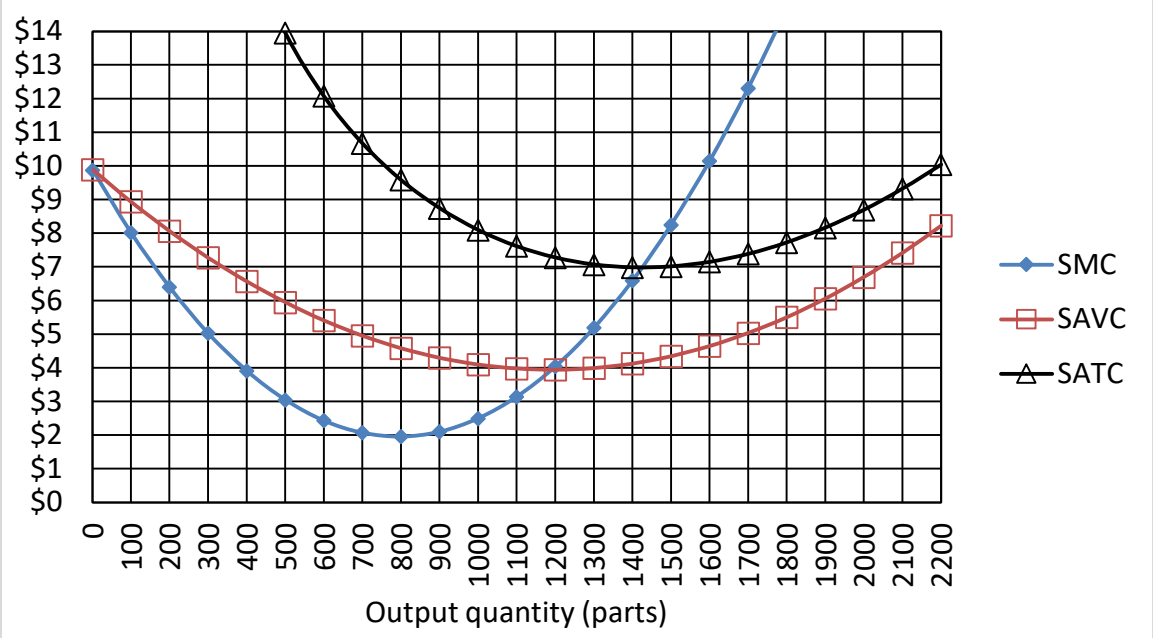
a. [4 pts] Compute the marginal cost schedule. Insert your answers above.
b. [4 pts] Compute the marginal benefit schedule. Insert your answers above.
c. [2 pts] How long should the wall be? (Answer must be 0, 5, 10, 15, or 20 miles.) ____ miles

(4) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **10%.**

a. Suppose a particular project will *cost* a firm $500 today, but will bring $250 in revenue a year from today, and $300 in revenue two years from today. Compute the *net present value* of this project to the nearest whole dollar. $ ____

b. Suppose a firm is expected to enjoy $5 million in profit every year, perpetually, beginning a year from today. Compute the value of the firm. $ ____ million

(5) [Short-run cost curves and supply: 20 pts] XYZ Manufacturing Company makes a small part used in trucks. XYZ is a small company in a big market, and therefore takes its output price as given. In the short run, the company faces daily cost curves as shown in the following diagram. Here, SMC denotes short-run marginal cost, SAVC denotes short-run average variable cost, and SATC denotes short-run average total cost.



Suppose the company were currently producing 500 parts for some unknown reason.

a. Compute the company's short-run total cost, to the nearest thousand dollars. $ thousand

b. Compute the company's short-run variable cost, to the nearest thousand dollars. $ thousand

c. Compute the company's short-run fixed cost, to the nearest thousand dollars. $ thousand

d. Suppose the company were currently producing 1600 parts for some unknown reason. If the company produced one more part, by how much would its total cost increase? That is, what would be the *change in total cost* as the company increased output from 1600 to 1601 parts? (Give an answer to the nearest dollar.) $

e. What is the company's break-even price—that is, the lowest price at which the company can avoid losses? (Give an answer to the nearest dollar.) $

f. What is the company's shut-down price—that is, the lowest price at which it will remain in operation in the short run? (Give an answer to the nearest dollar.) $

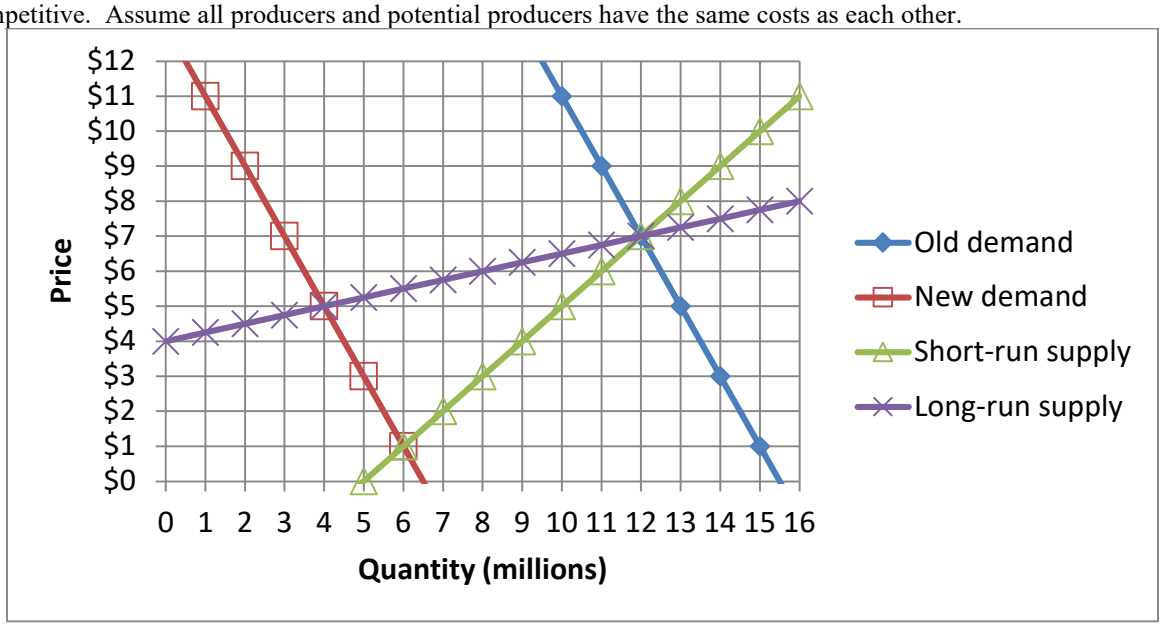
g. Suppose the price of parts is $5. How many parts should the company produce? (Give an answer to the nearest hundred.) parts

h. Will the company make a *profit* or a *loss* at a price of $5?

i. Suppose the price of parts is $2. How many parts should the company produce? (Give an answer to the nearest hundred.) parts

j. Will the company make a *profit* or a *loss* at a price of $2?

(6) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for kumquats, which is competitive. Assume all producers and potential producers have the same costs as each other.



Initially the market is in long-run equilibrium, with the demand curve given by "old demand" and the short-run supply curve given by "short-run supply" as shown in the graph.

a. What is the initial equilibrium price? $

b. What is the initial equilibrium quantity? million

c. What is the average cost of production for producers in this industry? $

Suppose that a government report says that kumquats are bad for health, and the demand shifts to "new demand." Consider the **short-run** market response to this demand shift.

d. What is the new equilibrium price in the short run? $

e. What is the new equilibrium quantity in the short run? million

f. Are producers in this market making economic *profits, losses*, or just *breaking even*?

Now, consider the **long-run** market response to this demand shift.

g. Given your answer to (f) above, will existing producers try to *exit* the market or will new producers try to *enter* the market?

h. What is the new equilibrium price in the long run? $

i. What is the new equilibrium quantity in the long run? million

j. What is the new long-run average cost of production for producers in this market? $

k. Has the number of producers in this market *increased, decreased*, or remained *constant*?

l. Should this industry be called a *constant-cost* industry, an *increasing-cost* industry, or a *decreasing-cost* industry?

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

(1) Suppose you are shopping for a new computer. You find a good one at Store A for $500. You pay a nonrefundable deposit of $200, expecting to pay the balance of $300 and pick up your computer next week. Then you discover that Store B will sell you the same computer for $350. Will you buy your computer from Store A or Store B? Justify your answer, giving the value of the sunk cost if there is one.

(2) Suppose you operate a lawn-mowing business in a competitive market, where everyone charges about $20 for an average-size lawn. In other words, you can take the price of $20 as given. You review your costs to decide what to do. You discover that your average cost per lawn is about $10, but your marginal cost per lawn is about $30. Should you expand your business, downsize it, or neither? Justify your answer.

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]