

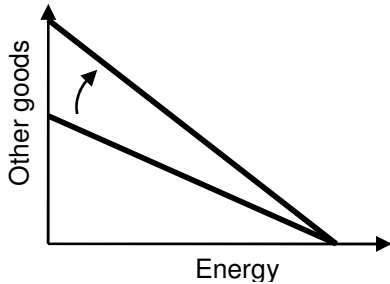
**EXAMINATION #3 VERSION B**  
**"Choices Underlying Supply and Demand"**  
**April 4, 2012**

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Cell phones or other wireless devices are NOT permitted. Point values for each question are noted in brackets. Points will be subtracted for illegible writing or incorrect rounding. Maximum total points are 100.

**I. Multiple choice:** Circle the one best answer to each question. [1 pt each, 16 pts total]

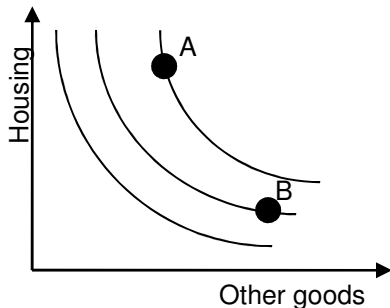
(1) In the graph below, the rotation of the budget line could be caused by

- 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.



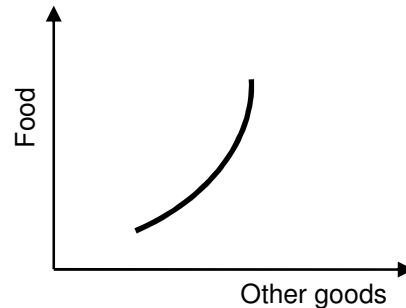
(2) The graph below shows Aaron's indifference curves and two possible combinations or bundles of goods. According to this graph, Aaron prefers

- a. bundle A to bundle B.
- b. bundle B to bundle A.
- c. bundles A and B equally.
- d. Cannot be determined from information given.



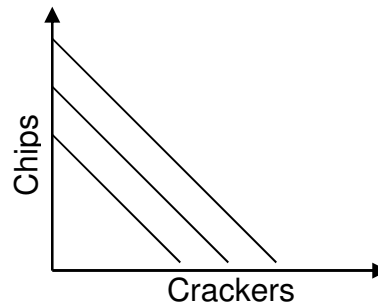
(3) What is wrong with the indifference-curve graph below?

- a. It violates the assumption that consumers do the best they can with what they have.
- b. It violates the Law of One Price.
- c. It violates the assumption of diminishing marginal rates of substitution.
- d. It violates the assumption that "more is better" from the consumer's perspective.

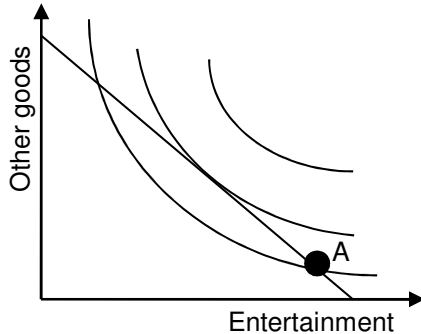


(4) The indifference-curve graph below shows Beth's preferences. It reveals that, for Beth, chips and crackers are

- a. perfect squares.
- b. perfect substitutes.
- c. perfect complements.
- d. perfectly elastic.



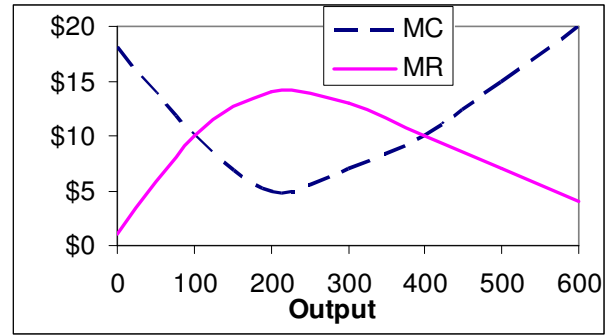
- (5) Carl's indifference-curve diagram is shown below. The straight line represents Carl's budget line and the curved lines represent his indifference curves. If Carl is currently at point A, he could be made better off without exceeding his budget by
- buying more other goods and less entertainment.
  - buying more entertainment and fewer other goods.
  - either (a) or (b).
  - Carl cannot be made better off by changing his purchases.



- (6) Which of the following is an economic cost but not an accounting cost?
- Wages paid to workers.
  - Money paid for electricity, raw materials, and supplies.
  - Lease payments.
  - The opportunity cost of the business owner's time spent running the business.
  - All of the above.

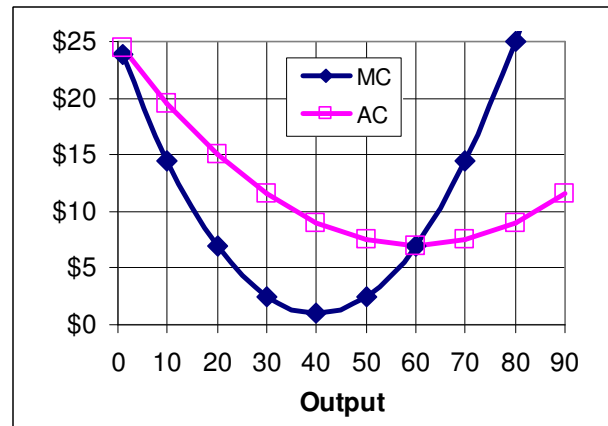
- (7) If at a certain level of output, marginal cost is *greater* than average cost, then average cost must be
- increasing.
  - decreasing.
  - at its minimum point.
  - Cannot be determined from information given.

- (8) Consider the graph below of a firm's marginal cost (MC) and marginal revenue (MR) curves. Suppose this firm is currently producing 300 units of output. It can increase its profit by
- increasing its output level.
  - decreasing its output level.
  - increasing or decreasing its output level.
  - It cannot increase its profit by changing its output level.



- (9) If a firm takes the market price as given, its *total revenue* curve is
- a downward-sloping line.
  - a horizontal line.
  - an upward-sloping line through the origin.
  - a downward-sloping curve with increasing slope.
  - an upward-sloping curve with decreasing slope.

- (10) ABC Company is a small firm in a big market and therefore takes the market price as given. Its marginal cost (MC) and average cost (AC) curves are shown below. To maximize profit, ABC Company should set its output at
- 20 units.
  - 40 units.
  - 60 units.
  - 80 units.
  - Cannot be determined without knowing market price.



- (11) In the short run, which kind of cost does *not* depend on the level of output?
- Total cost.
  - Fixed cost.
  - Variable cost.
  - Marginal cost

(12) In the *short run*, a firm should shut down if its revenue is insufficient to pay even its

- a. total cost.
- b. accounting cost.
- c. fixed cost.
- d. variable cost.

(13) The formula for discounting shows that the present discounted value of a payment to be received in the future is *smaller*,

- a. the lower the interest rate (or discount rate).
- b. the longer the wait until the payment is received.
- c. Both (a) and (b).
- d. Neither (a) nor (b).

(14) Firms are currently exiting the camera industry because in so doing they hope to

- a. raise the market price.
- b. raise the profits of remaining camera producers.
- c. reduce economic losses.
- d. decrease the total quantity of cameras produced in the market.
- e. All of the above.

(15) If any firms *leave* the mobile-phone industry, the

- a. short-run supply curve of mobile phones will shift right.
- b. short-run supply curve of mobile phones will shift left.
- c. short-run demand curve for mobile phones will shift right.
- d. short-run demand curve for mobile phones will shift left.

(16) *Price equals marginal cost* in a competitive industry in both short-run and long-run equilibrium because

- a. business owners have a sense of fairness.
- b. individual firms adjust their output levels 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.

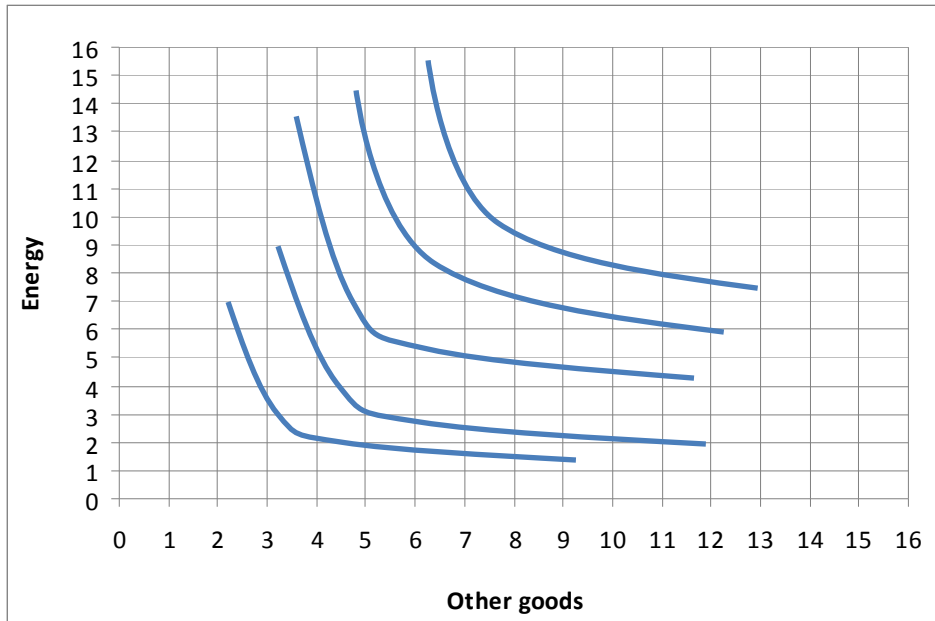
(1) [Rational choice: 12 pts] The following table gives the total benefit and total cost of track for a proposed light-rail (trolley) line.

Miles of track	Total cost	Total benefit	Marginal cost per mile	Marginal benefit per mile
0	\$ 0	\$0		
			\$ million	\$ million
2	\$2 million	\$6 million		
			\$ million	\$ million
4	\$5 million	\$14 million		
			\$ million	\$ million
6	\$8 million	\$18 million		
			\$ million	\$ million
8	\$12 million	\$24 million		
			\$ million	\$ million
10	\$18 million	\$28 million		

- a. [5 pts] Compute the marginal cost schedule. Insert your answers above.
- b. [5 pts] Compute the marginal benefit schedule. Insert your answers above.
- c. [2 pts] How many miles of track should the government construct? (Answer must be 0, 2, 4, 6, 8, or 10.)

miles
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(2) [Consumer choice and demand: 16 pts] The indifference curves in the graph below represent Eric’s preferences for energy and other goods.



- a. Would Eric rather have 6 units of energy and 5 units of other goods, or 2 units of energy and 11 units of other goods?
- b. Would Eric rather have 9 units of energy and 6 units of other goods, or 11 units of energy and 4 units of other goods?

units of energy and	units of other goods
units of energy and	units of other goods

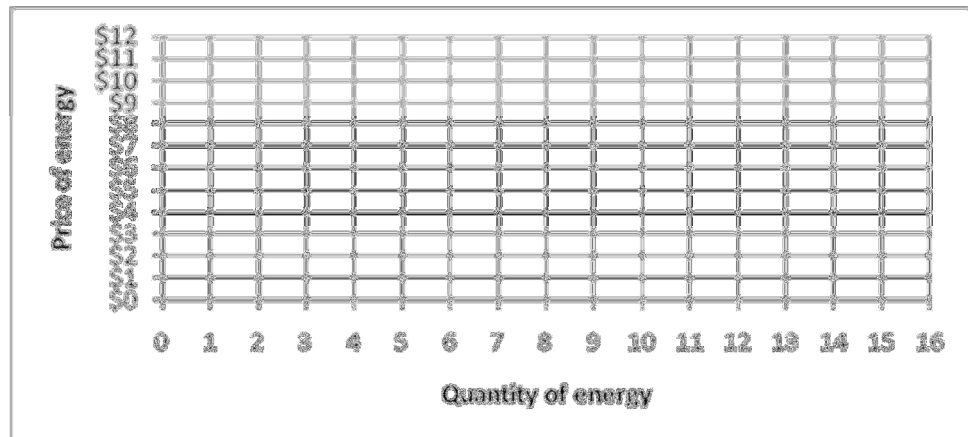
Suppose Eric has a budget of \$80 to spend on energy and other goods. The price of other goods is \$10.

- c. **Using a straightedge**, carefully draw Eric’s budget line when the price of energy is \$5. Label this budget line “A”.
- d. How much energy will Eric buy if the price of energy is \$5?
- e. **Using a straightedge**, carefully draw Eric’s budget line when the price of energy is \$10. Label this budget line “B”.
- f. How much energy will Eric buy if the price of energy is \$10?

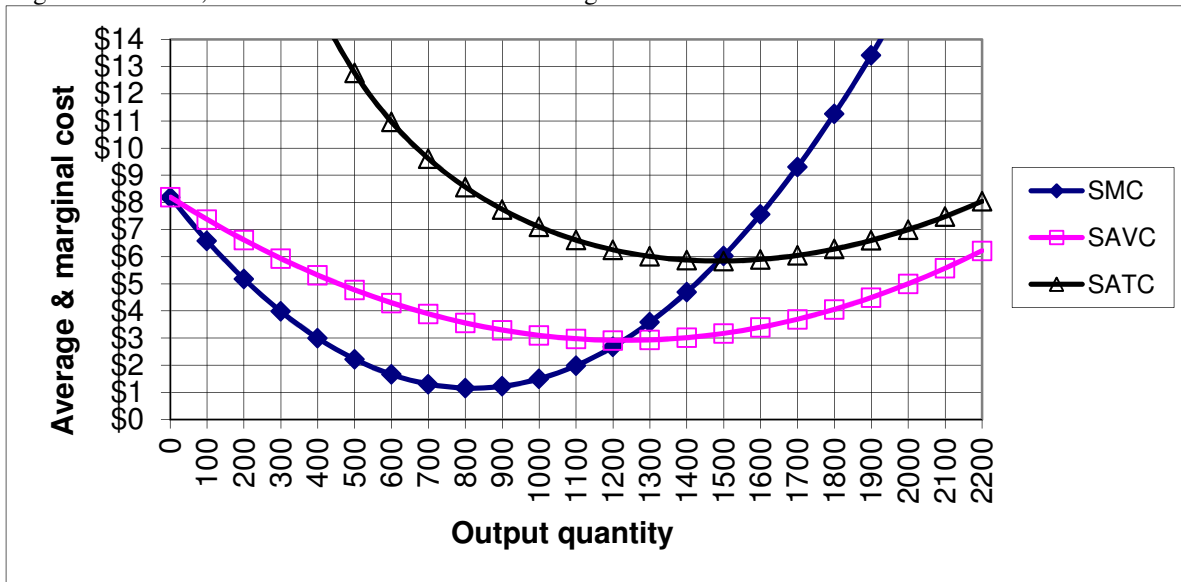
	units of energy
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	units of energy
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- g. Plot two points on Eric’s demand curve for energy, and sketch his demand curve at right.



(3) [Short-run cost curves and supply: 24 pts] Micro Technologies Company makes computer parts. It 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 2000 parts for some unknown reason.

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

\$	thousand
\$	thousand
\$	thousand

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

\$	thousand
\$	thousand
\$	thousand

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

\$	thousand
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d. Suppose the company were currently producing 1100 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 1100 to 1101 parts? (Give an answer to the nearest dollar.)

\$	
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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.)

\$	
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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.)

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

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

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

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

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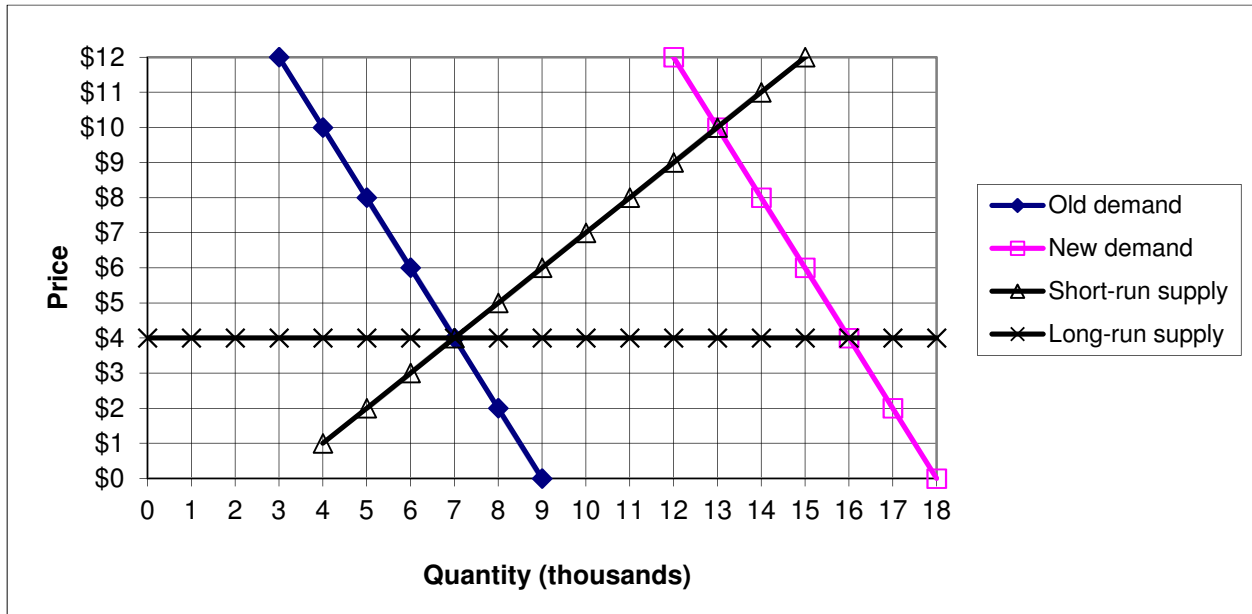
k. Suppose the price of parts is \$11. How many parts should the company produce? (Give an answer to the nearest hundred.)

	parts
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l. Will the company make a *profit* or a *loss* at a price of \$11?

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(4) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for snow shovels, 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.

- What is the initial equilibrium price?
- What is the initial equilibrium quantity?
- What is the average cost of production for firms in this industry?

\$
thousand
\$

A series of blizzards occurs, and demand shifts right to “new demand.” Consider the **short-run** market response to this demand shift.

- What is the new equilibrium price in the short run?
- What is the new equilibrium quantity in the short run?
- Are producers making economic *profits*, *losses*, or just *breaking even*?

\$
thousand

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

- Given your answer to (f) above, will existing firms try to *exit* the industry or will new firms try to *enter* the industry?
- What is the new equilibrium price in the long run?
- What is the new equilibrium quantity in the long run?
- What is the new long-run average cost of production for firms in this industry?
- Has the number of firms in this industry *increased*, *decreased*, or remained *constant*?
- Should this industry be called a *constant-cost* industry, an *increasing-cost* industry, or a *decreasing-cost* industry?

\$
thousand
\$

(5) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **3 %**.

- a. Suppose \$500 is to be received one year from today, \$1000 is to be received two years from today, and \$1500 is to be received three years from today. Compute the present discounted value of this stream of payments, to the nearest whole dollar.

\$	
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- b. Suppose a firm is expected to enjoy \$12 million in profits every year, perpetually, beginning a year from today. Compute the value of the firm.

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

- (1) Samantha enjoys pickles and ice cream, but not together. Let bundle A be two jars of pickles and zero boxes of ice cream. Let bundle B be zero jars of pickles and two boxes of ice cream. Let bundle C be one jar of pickles and one box of ice cream. For Samantha, bundle A and bundle B are equally preferred, but bundle A or bundle B are more preferred than bundle C. Plot these three bundles and draw Samantha's indifference curves that pass through these bundles.
- (2) Your company needs a new computer system. You have just paid \$100,000 to have a new system installed by Vendor A, and this money cannot be recovered. However, you will still need to spend \$50,000 on training so that your people learn to use the new system. Suddenly, Vendor B offers to sell you an alternative computer system. Vendor B's system will cost only \$50,000 to install, and only \$25,000 for training. Should you switch to Vendor B's system? Justify your answer, identifying any sunk costs. (Do not draw a graph.)

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]