EXAMINATION 3 VERSION B
## "Choices Underlying Supply and Demand"
November 4, 2016

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards 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, 9 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.
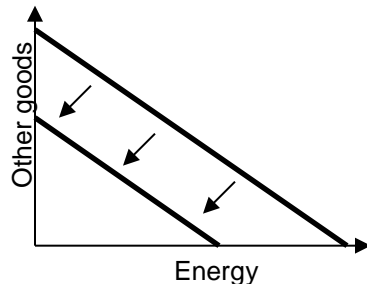
(2) The shape and position of a person's indifference curves depend on
a.   their income.
b.   the prices they face in the market.
c.   their preferences for different bundles.
d.   all of the above.

(3) A person's marginal rate of substitution shows
a.   the amount of one good the person would need to be given in exchange for taking away one unit of the other good in order to be equally happy.
b.   how much of one good the person is willing to trade for one more unit of another good.
c.   the slope of the person's indifference curve, in absolute value.
d.   all of the above.

(4) 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 now at point A, he could be made better off without exceeding his budget by
a.   buying more other goods and less entertainment.
b.   buying more entertainment and fewer other goods.
c.   either (a) or (b).
d.   Carl cannot be made better off by changing his purchases.
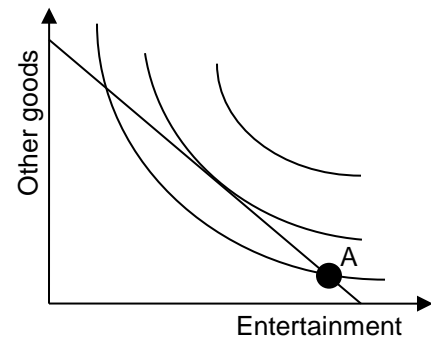
(5) Production of electric cars is increasing. An increase in the number of electric cars produced by each company is called a change at the
a.   extensive margin.
b.   intensive margin.
c.   marginal product.
d.   marginal revenue.

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

(7) If at a certain level of output, marginal cost is *greater than* average cost, then the average cost curve must be
a.   upward-sloping.
b.   downward-sloping.
c.   at its minimum point.
d.   Cannot be determined from information given.

(8) A small firm in a big market maximizes its profit by
a.   moving its cost curves so that price equals marginal cost at its desired output level.
b.   adjusting price so that price equals marginal cost.
c.   adjusting output so that price equals marginal cost.
d.   all of the above.

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

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) [Extreme preferences: 10 pts] Amanda's preferences for Gatorade and Powerade are depicted in the straight-line **indifference curves** shown below.
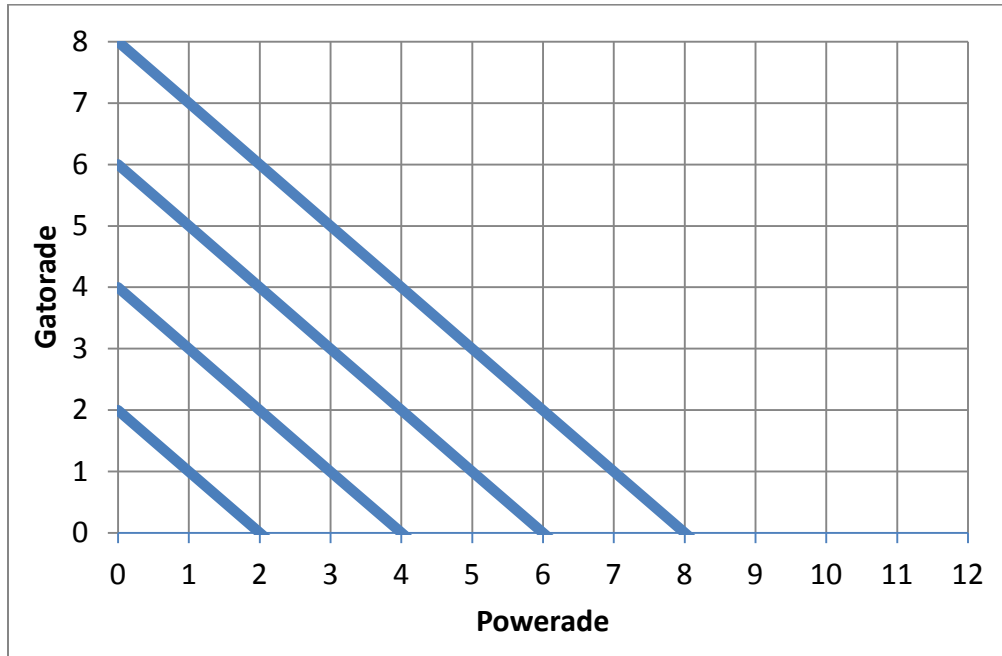
a. Which would Amanda prefer to have: 2 bottles of Gatorade and 2 bottles of Powerade, or 6 bottles of Gatorade and no bottles of Powerade?

b. Does Amanda view Powerade and Gatorade as *perfect substitutes, perfect complements,* or *neither?*

bottles of Gatorade and	bottles of Powerade

Assume that bottles of Powerade cost $2 and bottles of Gatorade cost $3. Amanda's income budgeted for these two items is $12.

c. **Using a straightedge,** carefully draw Amanda's budget line on the graph above.

d. How many bottles of Powerade will Amanda purchase?

e. How many bottles of Gatorade will Amanda purchase?

bottles
bottles

(2) [Consumer choice and demand: 16 pts]   The indifference curves in the graph below represent Ben's preferences for sandwiches and mini-pizzas.
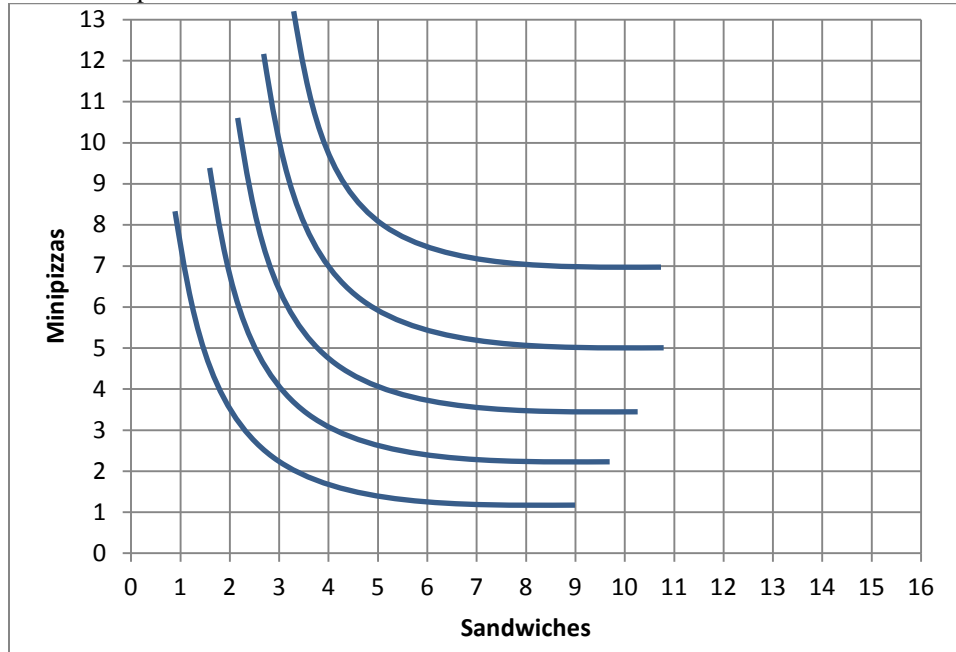
a. Would Ben rather have 1 sandwich and 8 mini-pizzas, or 3 sandwiches and 4 mini-pizzas?

sandwiches	mini-pizzas
and	

b. Would Ben rather have 10 sandwiches and 5 mini-pizzas, or 5 sandwiches and 8 mini-pizzas?

sandwiches	mini-pizzas
and	

Suppose Ben has a snack budget of $60 to spend on mini-pizzas and sandwiches. The price of sandwiches is $4.

c. **Using a straightedge**, carefully draw Ben's budget line when the price of mini-pizzas is $5. Label this budget line "A".

d. How many mini-pizzas will Ben buy if the price of mini-pizzas is $5?

mini-pizzas

e. **Using a straightedge**, carefully draw Ben's budget line when the price of mini-pizzas is $10. Label this budget line "B".

f. How many mini-pizzas will Ben buy if the price of mini-pizzas is $10?

mini-pizzas

g. Plot two points on Ben's demand curve for mini-pizzas, and sketch his demand curve at right.
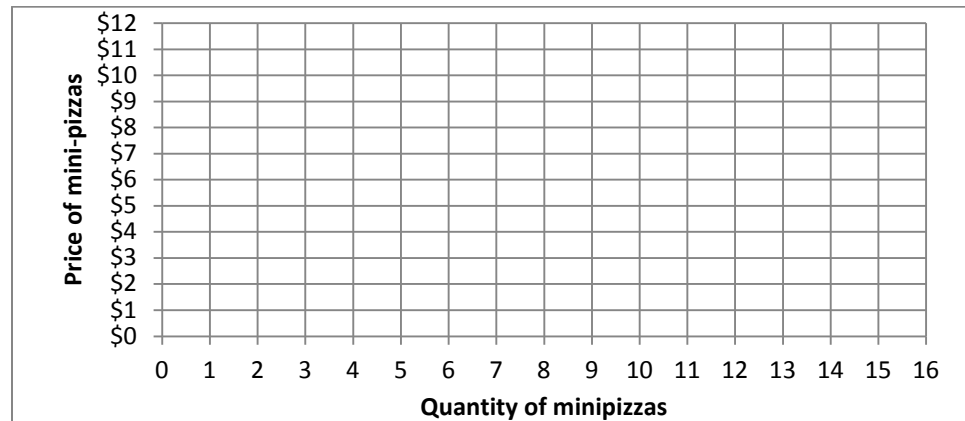
(3) [Rational choice: 10 pts] The government is considering building levy to prevent flooding. The following are cost and benefit estimates for levies of different lengths.

Miles	Total cost	Total benefit	Marginal cost per mile	Marginal benefit per mile
0	$ 0	$0		
			$ million	$ million
2	$6 million	$20 million		
			$ million	$ million
4	$14 million	$30 million		
			$ million	$ million
6	$22 million	$36 million		
			$ million	$ million
8	$28 million	$38 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 runway be? (Answer must be 0, 2, 4, 6, or 8 miles.)

   [miles]

(4) [Basic definitions, cost and revenue: 3 pts] Insert the appropriate term from the list below in each box. The same term may be entered in more than one box.

   Total revenue   *Average revenue*   *Marginal revenue*
   Total cost   *Average cost*   *Marginal cost*

   a. Money paid for all inputs purchased or hired.

   b. Increase in total revenue from producing and selling
      another unit of output.

   c. Change in cost divided by change in output.

(5) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **10 %.**
   a. Suppose a particular project will *cost* a firm $8000 today, but will bring
      $3000 in revenue a year from today, and $6000 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 $2 million in profit every year,
      perpetually, beginning a year from today. Compute the value of the firm.

      [$ million]

(6) [Short-run cost curves and supply: 20 pts] Acme Illumination Company makes flashlights. 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.
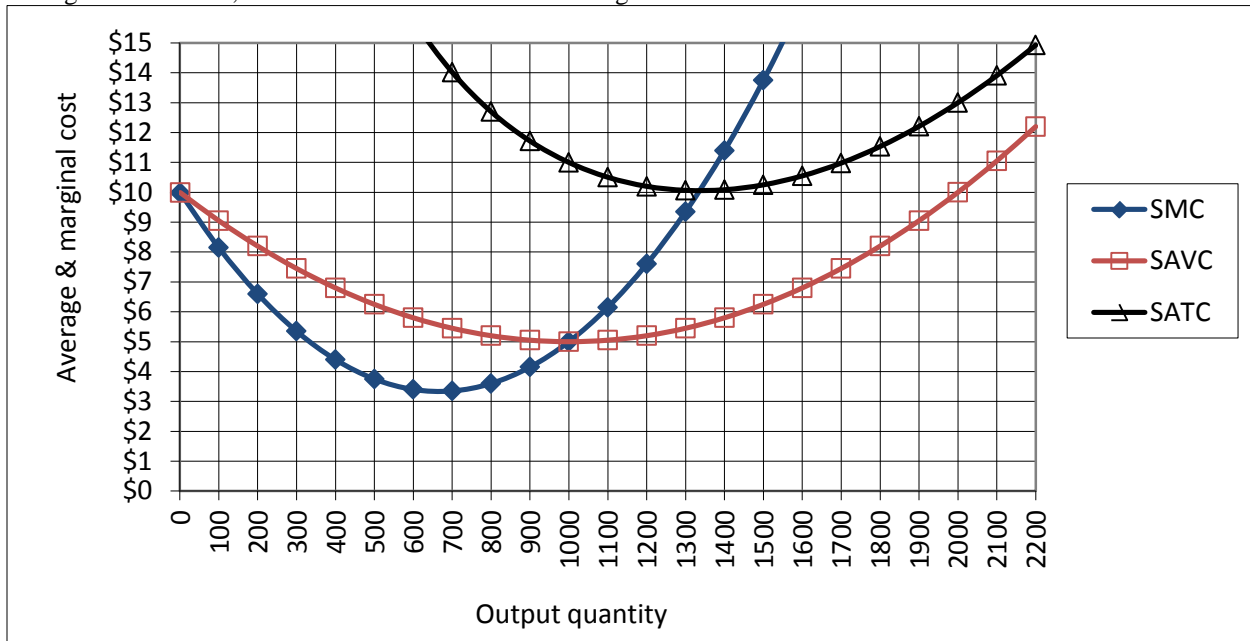
Suppose the company were currently producing 2000 flashlights for some unknown reason.

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 1100 flashlights for some unknown reason. If the company produced one more flashlight, 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 flashlights? (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 flashlights is $4. How many flashlights should the company produce? (Give an answer to the nearest hundred.)

_____ flashlights

h. Will the company make a *profit* or a *loss* at a price of $4?

i. Suppose the price of flashlights is $14. How many flashlights should the company produce? (Give an answer to the nearest hundred.)

_____ flashlights

j. Will the company make a *profit* or a *loss* at a price of $14?

(7) [Long-run competitive equilibrium: 24 pts] The graph below shows the market for fanny packs, which is competitive. Assume all producers and potential producers have the same costs as each other.
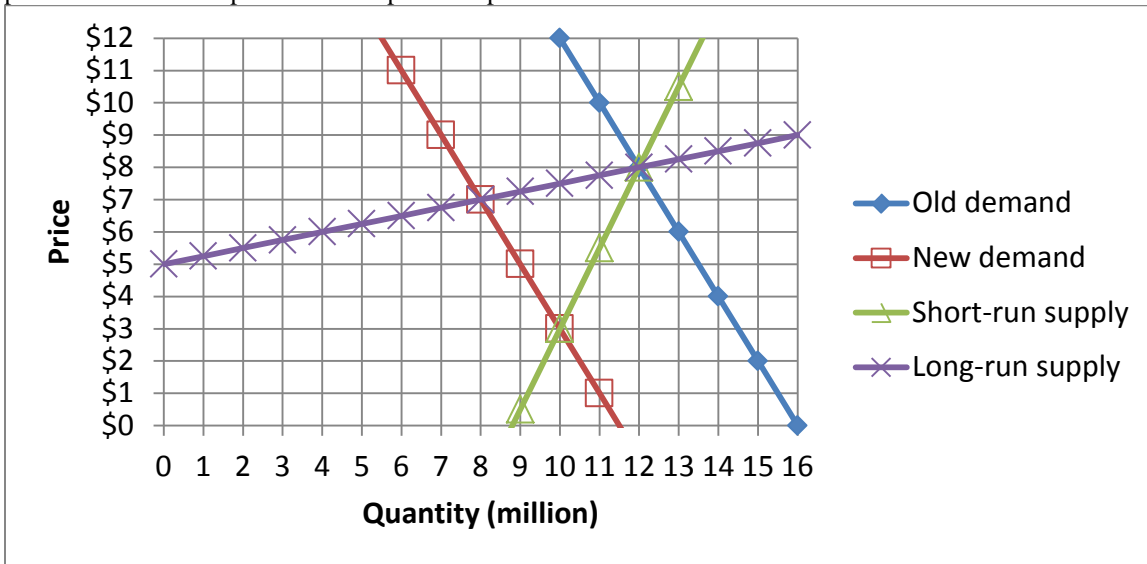
Initially the market is in long-run equilibrium, with the demand curve given by "old demand" and the short-run supply curve given by "short-run supply" as shown in the graph.

a. What is the initial equilibrium price?

$

b. What is the initial equilibrium quantity?

million

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

$

Suppose that fanny packs suddenly become unpopular, 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 fanny-pack makers making economic *profits, losses*, or just *breaking even*?

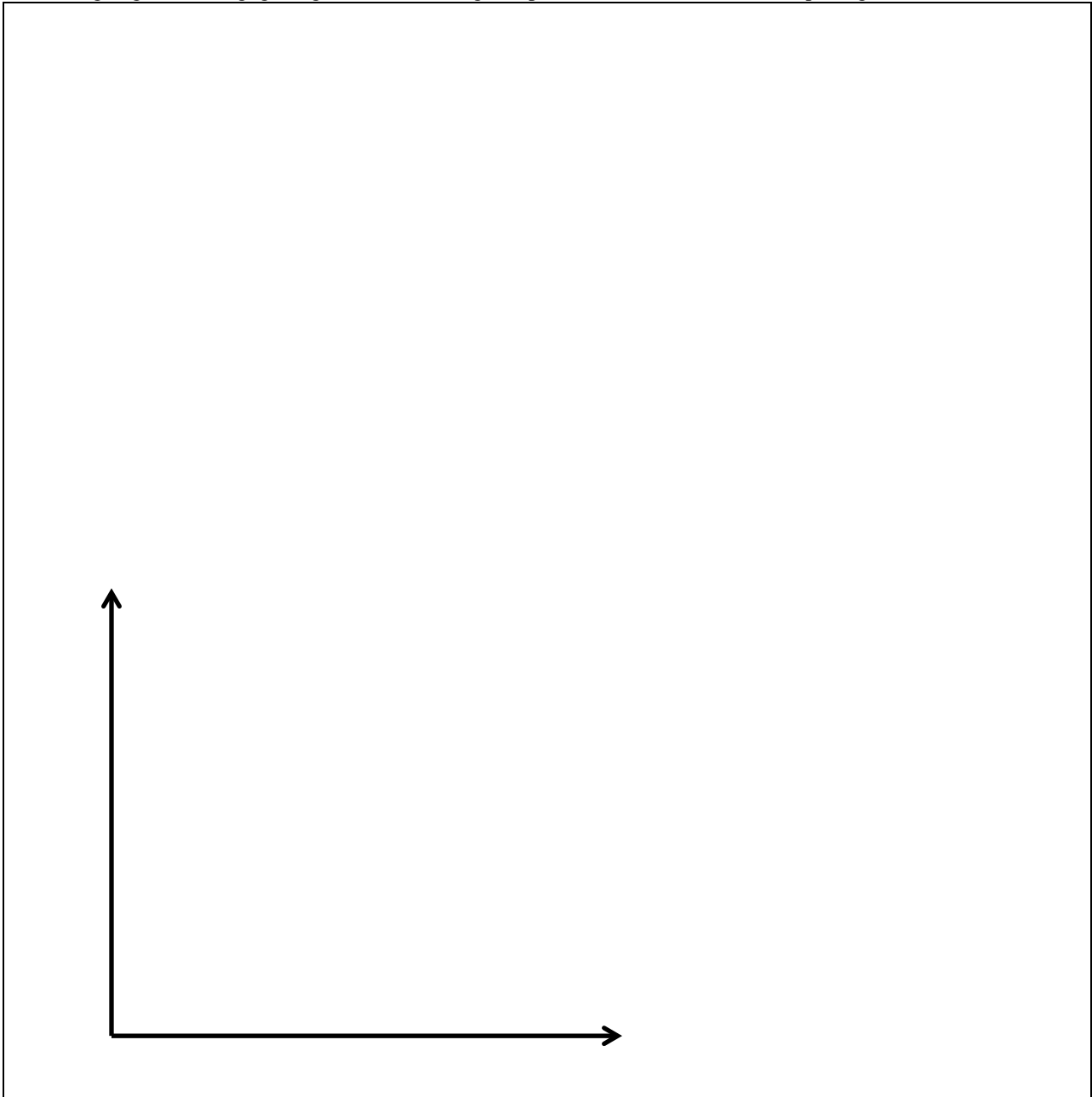Now, consider the **long-run** market response to this demand shift.

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

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 firms in this industry?

$

k. Has the number of firms in this industry *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 $400. You pay a nonrefundable deposit of $100, expecting to pay the balance of $300 and pick up your computer tomorrow. 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, identifying any sunk cost(s). (Do not draw a graph.)

(2) Why can't a person's indifference curves cross each other? Give a verbal explanation using the assumption that "more is better," and draw a graph to illustrate the problem.

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]