EXAMINATION 3 VERSION C
"Choices Underlying Supply and Demand"
November 6, 2015

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, 5 pts total]

(1) A change in the number of people who smoke cigarettes is called a change at the
a.   intensive margin.
b.   marginal product.
c.   marginal revenue.
d.   extensive margin.

(2) 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 food.
d.   a decrease in the price of food.
e.   an increase in the price of other goods.
f.   a decrease in the price of other goods.
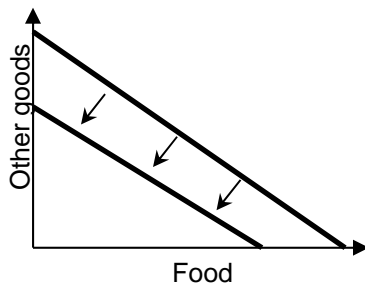
(3) Good reasons to believe that business firms maximize profit do *not* include
a.   Firms which do not maximize profit are often pushed out of the market by firms that do.
b.   Firms whose managers resist maximizing profit are likely to be taken over by new owners who appoint managers more willing and able to maximize profit.
c.   The owners of firms get to keep the profits so they have an incentive to keep profits high.
d.   Maximizing profit is good for society and firms wish to maximize social welfare.

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

(5) Firms are now entering the smart watch industry because in so doing they hope to
a.   increase the total quantity produced in the market.
b.   lower the market price.
c.   lower the profits of existing smart watch producers.
d.   enjoy economic profits.
e.   All of the above.

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) [Budget line: 14 pts] Aubrey's budget for gasoline and sandwiches is depicted in the **budget line** below.
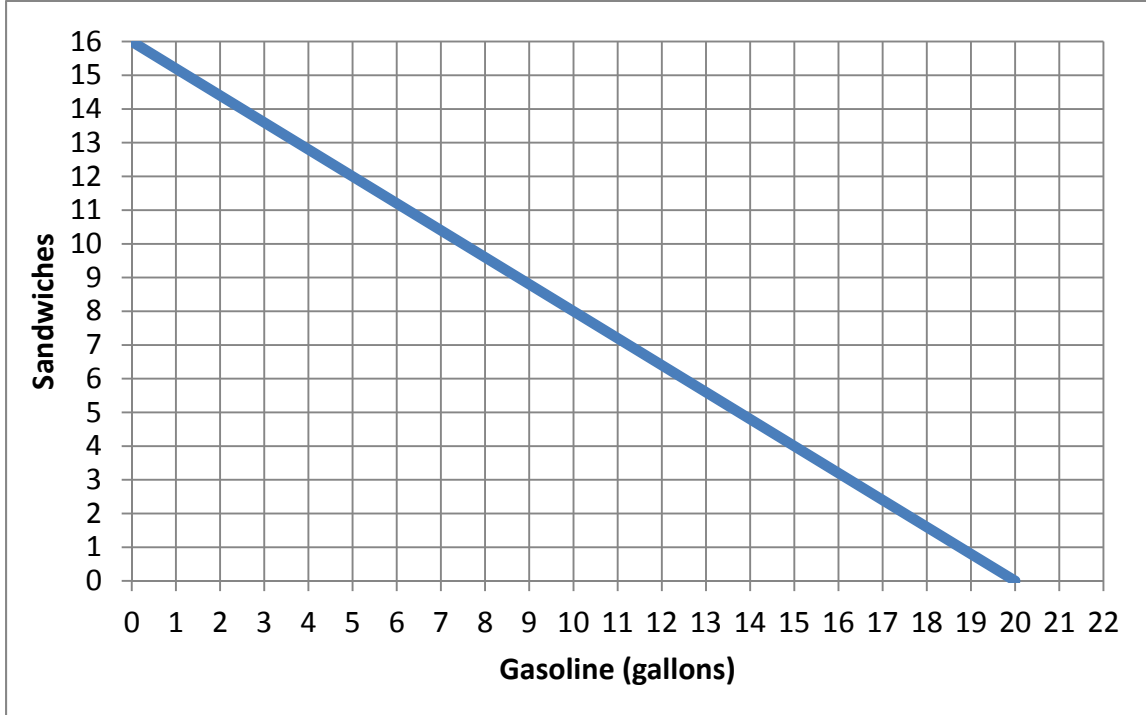
Determine whether the following combinations of goods are *exactly affordable, affordable with money left over,* or *not affordable* for Aubrey.

   a. 14 sandwiches and 4 gallons of gasoline.

   b. 2 sandwiches and 16 gallons of gasoline.

   c. 8 sandwiches and 10 gallons of gasoline.

Assume that Aubrey spends all her income on gasoline and sandwiches.
   d. What is Aubrey's opportunity cost of a gallon of gasoline?

sandwiches

   e. Aubrey's indifference curves are not shown in this graph. Nevertheless, we know that at Aubrey's best-choice combination, her marginal rate of substitution of gasoline for sandwiches (that is, the slope of her indifference curve) must equal what number?
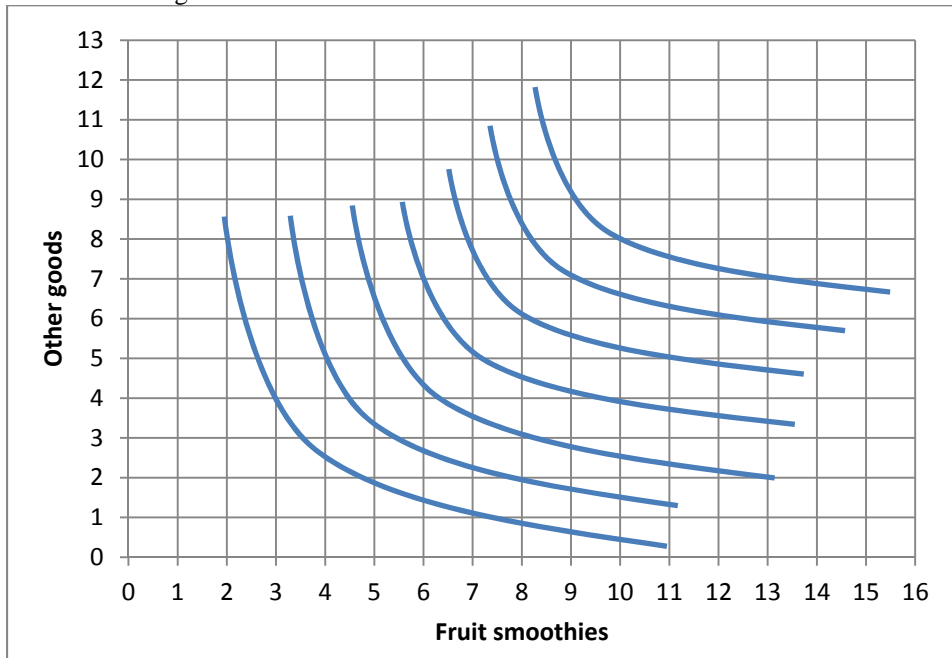
Assume that Aubrey's income is **$ 80**.
   f. What must be the price of gasoline?

$

   g. What must be the price of sandwiches?

$

(2) [Consumer choice and demand: 16 pts]   The indifference curves in the graph below represent Ben's preferences for fruit smoothies and other goods.

a. Would Ben rather have 2 smoothies and 8 units of other goods, or 4 smoothies and 5 units of other goods?

smoothies	units of
and	other goods

b. Would Ben rather have 13 smoothies and 2 units of other goods, or 7 smoothies and 5 units of other goods?

smoothies	units of
and	other goods

Suppose Ben has a budget of $48 to spend on smoothies and other goods. The price of other goods is $4.

c. **Using a straightedge**, carefully draw Ben's budget line when the price of smoothies is $3. Label this budget line "A".

d. How many smoothies will Ben buy if the price of smoothies is $3?

smoothies

e. **Using a straightedge**, carefully draw Ben's budget line when the price of smoothies is $4. Label this budget line "B".

f. How many smoothies will Ben buy if the price of smoothies is $4?

smoothies

g. Plot two points on Ben's demand curve for smoothies, and sketch his demand curve at right.
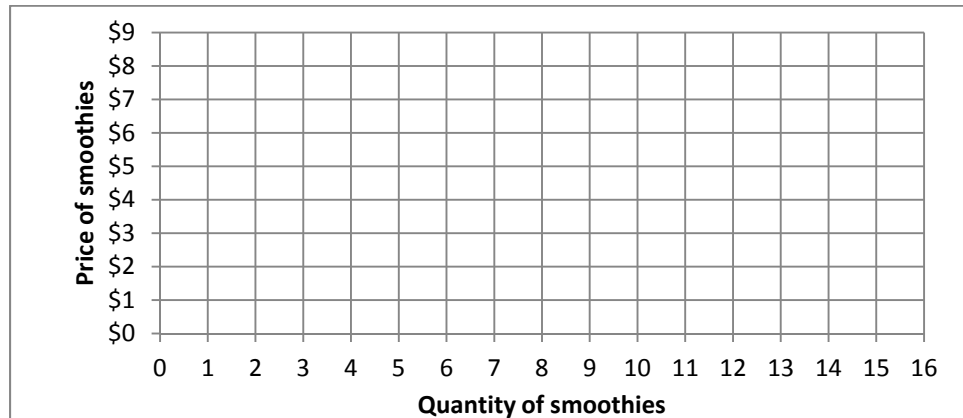
(3) [Rational choice: 10 pts] The government is considering building a new runway at the county airport. The following are cost and benefit estimates for runways of different lengths.

Miles	Total cost	Total benefit	Marginal cost per mile	Marginal benefit per mile
0	$ 0	$0		
			$ million	$ million
0.5	$0.4 million	$2.0 million		
			$ million	$ million
1.0	$0.7 million	$2.6 million		
			$ million	$ million
1.5	$1.2 million	$3.3 million		
			$ million	$ million
2.0	$1.8 million	$3.5 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, 0.5, 1.0, 1.5, or 2.0 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. Change in revenue divided by change in output.

   b. Increase in total cost from producing another unit of output.

   c. Slope of total cost curve.

(5) [Discounting: 4 pts] Answer the following questions, assuming the interest rate is **8 %.**

   a. Suppose a particular project will *cost* a firm $5000 today, but will bring $3000 in revenue a year from today, and $4000 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 $40 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] Zap Electronics makes an electronic component. 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.
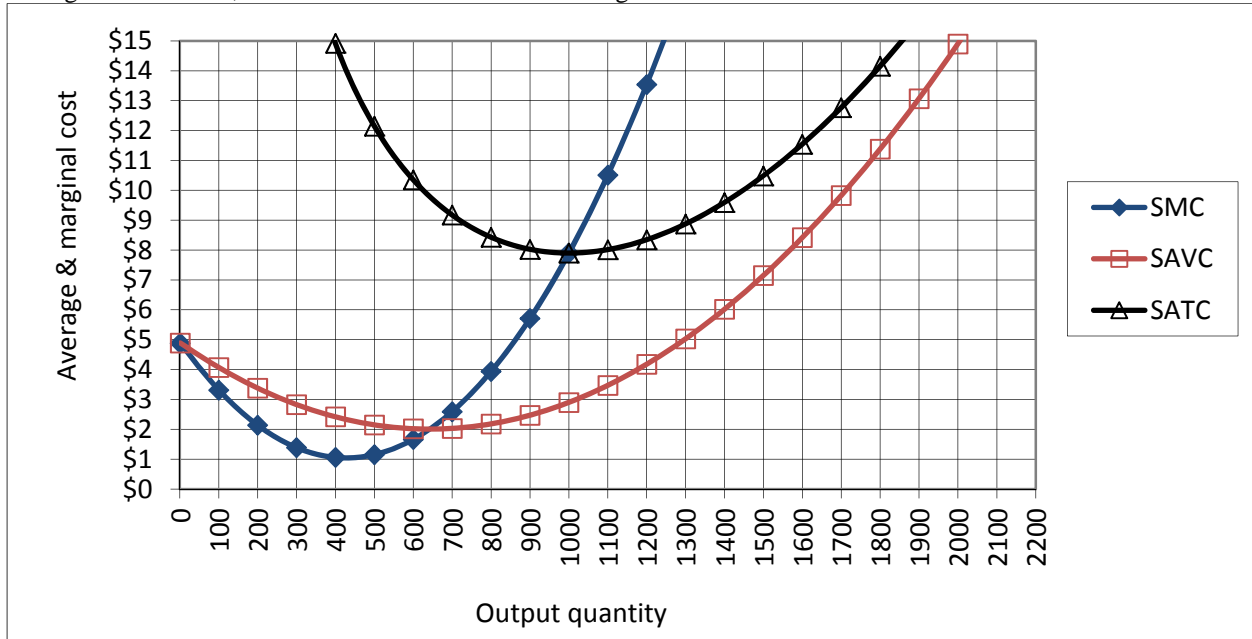
Suppose the company were currently producing 500 components for some unknown reason.

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 800 components for some unknown reason. If the company produced one more component, by how much would its total cost increase? That is, what would be the *change in total cost* as the company increased output from 800 to 801 components? (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 components is $1. How many components should the company produce? (Give an answer to the nearest hundred.)

_____ components

h. Will the company make a *profit* or a *loss* at a price of $1?

_____

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

_____ components

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 fish oil, which is competitive. Assume all producers and potential producers have the same costs as each other.
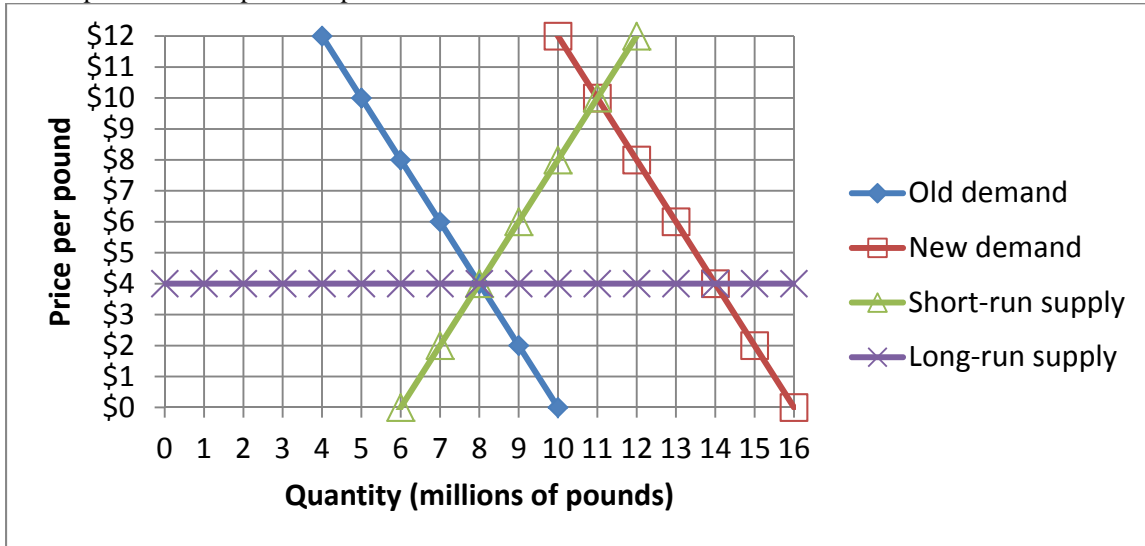
Initially the market is in long-run equilibrium, with the demand curve given by "old demand" and the short-run supply curve given by "short-run supply" as shown in the graph.

a. What is the initial equilibrium price?

$

b. What is the initial equilibrium quantity?

million pounds

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

$

Suppose that a new report suggests that fish oil may prevent cancer, 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 pounds

f. Are fish oil producers 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 pounds

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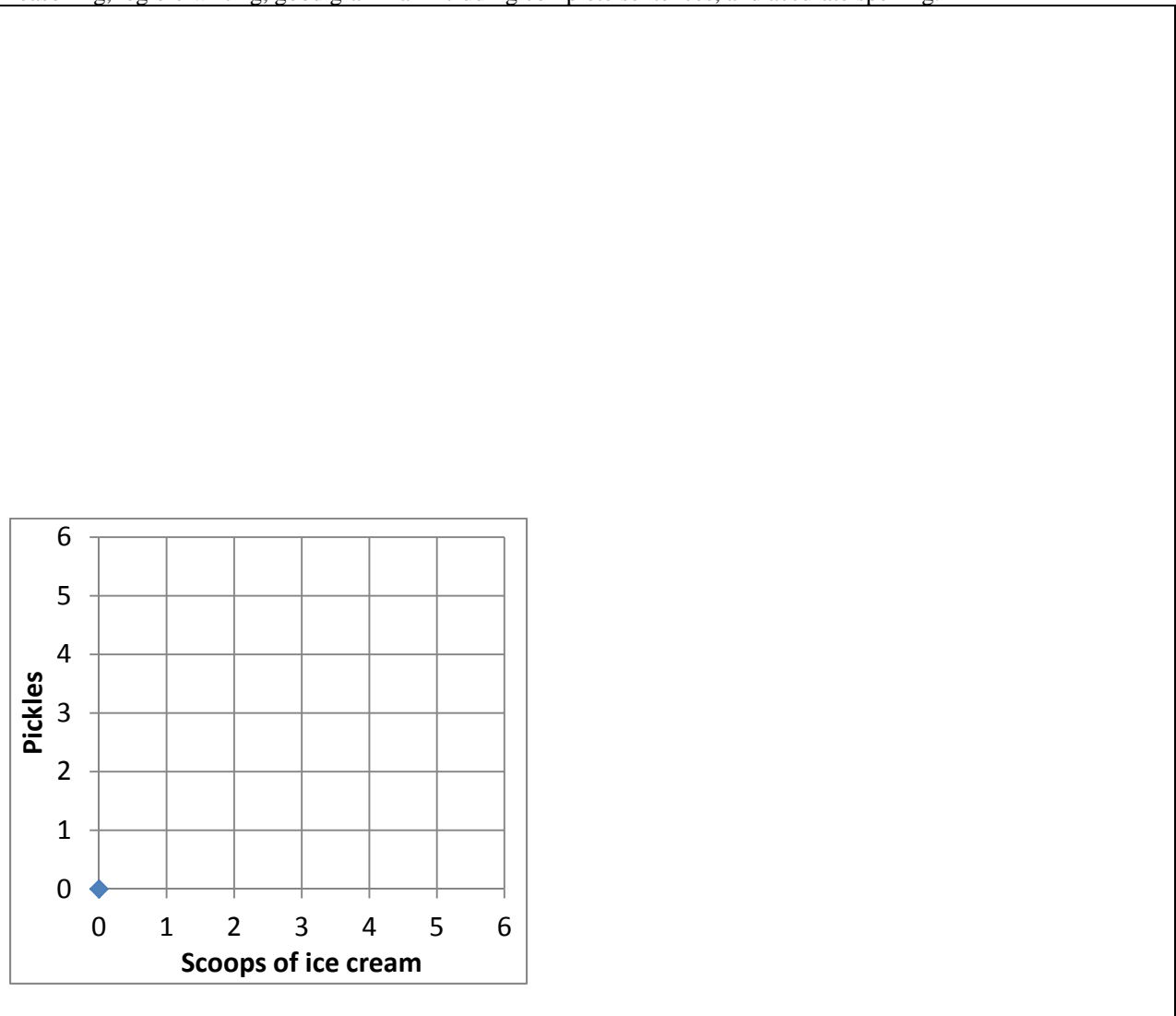
III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

(1) Caitlin enjoys pickles and ice cream, but not together. Let bundle A be four pickles and zero scoops of ice cream. Let bundle B be zero pickles and four scoops of ice cream. Let bundle C be two pickles and two scoops of ice cream. For Caitlin, bundle A and bundle B are equally preferred, but bundle C is *less preferred* than bundle A or bundle B.
  a. Plot and label these three bundles and draw Caitlin 's indifference curves that pass through these bundles.
  b. Explain what is peculiar about the shape of Caitlin's indifference curves.

(2) You operate a house-painting business in a competitive market, where everyone charges about $1000 for an average-size house. You know that you can get all the business you can handle if you just put up a few signs. You review your costs last year in order to decide what to do this year. You discover that last year, your average cost per house was about $800, and your marginal cost per house was about $1200. So this year, should you *expand* your business (paint more houses), *downsize* it (paint fewer houses), or *neither* (paint the same number of houses)? Justify your answer. (Ignore the 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]