ECON 120 - Regulation & Antitrust Policy
Drake University, Spring 2017
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Signature: _____

Printed name: _____

EXAMINATION 1 VERSION B
"Review of Perfect Competition"

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

I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 15 pts total]

(1) The *law of demand* means that
a. if buyers want something, they will pay whatever price is demanded by sellers.
b. the quantity that buyers want to buy is negatively related to the price.
c. demand curves must be straight lines.
d. anything consumers want will be produced.

(2) Most plastic is made from petroleum. If the price of petroleum falls, then the
a. demand for plastic will shift left.
b. demand for plastic will shift right.
c. supply of plastic will shift left.
d. supply of plastic will shift right.

(3) Excess demand in the market for wheat would cause the price of wheat to
a. increase.
b. decrease.
c. oscillate up and down.
d. remain constant.

(4) Which demand equation below shows constant price elasticity of demand?
a. $Q = 500 - 2\,P + 0.0001\,P^2$.
b. $Q = 1000 - 20\,P$.
c. $Q = -1 + 200/P$.
d. $Q = 10{,}000\,P^{-2}$.

(5) The price elasticity of demand for food is about – 0.2. If the price of food rises, then the amount of money consumers spend on food will
a. increase.
b. decrease.
c. remain constant.
d. cannot be determined from information given.

(6) 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.

(7) At its current level of output, Acme Corporation's marginal cost is $4, its average cost is $3, and the price of its product is $5. (Assume Acme takes price as given.) Acme could increase its profit by
a. increasing its output level.
b. decreasing its output level.
c. either (a) or (b).
d. neither (a) nor (b).

(8) In the *short run*, a firm should shut down if its revenue is insufficient to pay even its
a. accounting cost.
b. fixed cost.
c. variable cost.
d. total cost.

(9) New firms enter an industry because they hope to
a. increase consumer surplus.
b. drive down the market price.
c. drive down the profits of existing firms.
d. enjoy economic profit.

(10) *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.

(11) Alyson is willing to pay $500 for an iPhone, but fortunately the price is only $200. If she buys an iPhone, her consumer surplus is
a. zero.
b. $200.
c. $300.
d. $500.
e. $700.

(12) Suppose consumers now buy 10 million gallons of ice cream at a price of $3 per gallon. If the price of ice cream rises to $5 per gallon, and nothing else affecting demand changes, the loss of welfare to consumers is
a. exactly $20 million.
b. less than $20 million.
c. more than $20 million.
d. Cannot be determined from information given.

(13) Suppose the paper industry is perfectly competitive and the price of a ream of paper is $4. Then any firm in the paper industry believes its marginal revenue is
a. zero.
b. more than $4.
c. less than $4.
d. exactly equal to $4.

(14) Suppose there is a change in government policy affecting the automobile industry. Which of the following outcomes would NOT pass the compensation test of Kaldor and Hicks?
a. Producers gain $10 billion while consumers gain $20 billion.
b. Producers gain $10 billion while consumers lose $20 billion.
c. Producers gain $20 billion while consumers lose $10 billion.
d. Both (b) and (c).
e. All of the above.

(15) Suppose that the bread industry is producing 3 million loaves of bread per month for some reason, and that at this level of output, the marginal benefit to consumers of a loaf of bread is $2, but the marginal cost of producing a loaf of bread is $3. Society would be better off if
a. fewer loaves of bread were produced.
b. more loaves of bread were produced.
c. None of the above.
d. Cannot be determined from information given.

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) [Using price elasticity of demand: 10 pts] Suppose the price elasticity of demand for a certain patented pharmaceutical drug is **-1.2**. Consider what would happen if the manufacturer raises the price of this drug by 5%. Assume income and other prices do not change.

a. Is demand for this drug elastic, inelastic, or unitary-elastic?	
b. Will the quantity sold of this drug *increase or decrease*?	
c. ... by about how much?	%
d. Will revenue received by the drug manufacturer *increase or decrease?*	
e. ... by about how much?	%

(2) [Profit maximization: 10 pts] Suppose a firm's total revenue function is given by $TR(q) = 14q - (q^2/40)$, and its total cost function is given by $TC(q) = 2q + (q^2/20)$. Find the following, showing your work and circling your final answers.

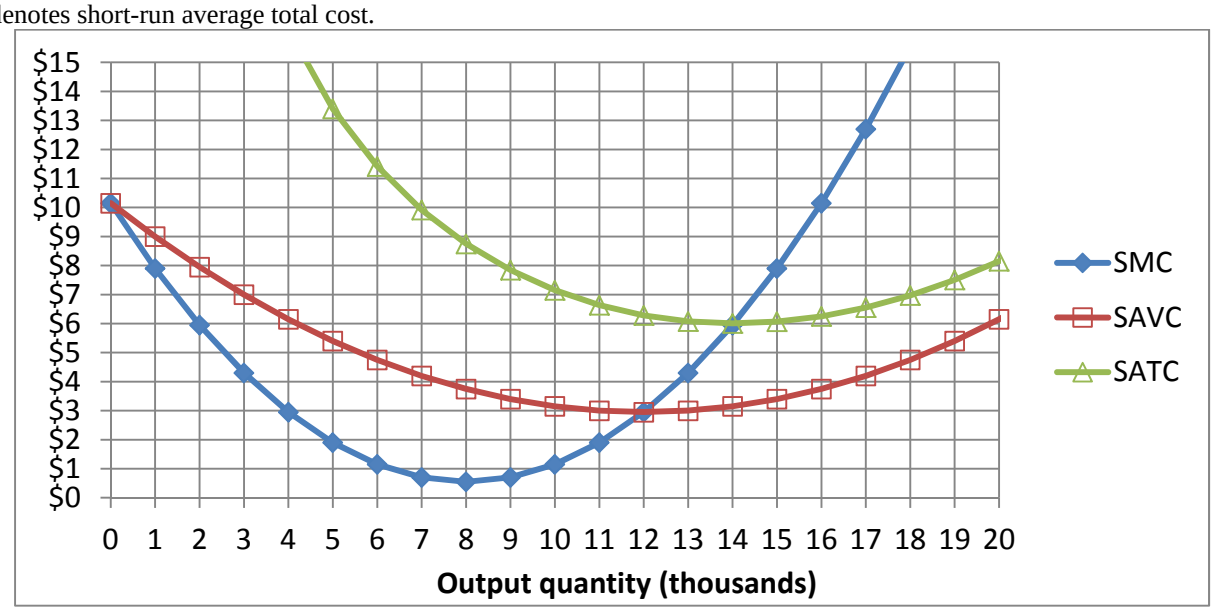
a. Find the firm's marginal revenue function MR(q).

b. Does this firm take price as given? Why or why not?

c. Find the firm's marginal cost function MC(q).

d. Compute the firm's profit-maximizing level of output q*. Show your work and circle your final answer.

(3) [Short-run cost curves and supply: 20 pts] ACME Manufacturing Company is a small firm in a big market, and therefore takes its output price as given. In the short run, ACME 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 20 thousand units of output, for some unknown reason.

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

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

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

Suppose the company were currently producing 4 thousand units of output, for some unknown reason.

d. If the company produced one more unit, by how much would its total cost increase? That is, what would be the *change in total cost* as the company increased output from 4000 to 4001 units? (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? $

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? $

g. Suppose the price of output is $8. How many units will the company produce? thousand

h. Will the company make a *profit* or a *loss* at a price of $8, or will it *break even?*

i. Suppose the price of output is $2. How many units will the company produce? thousand

j. Will the company make a *profit* or a *loss* at a price of $2, or will it *break even?*

(4) [Long-run cost and supply: 10 pts] [Long-run cost and supply] Suppose Acme Products Company has the following long-run cost function:

$$TC(q) = 0.02\ q^3 - 2\ q^2 + 56\ q$$

a. Find an expression for Acme's marginal cost function.

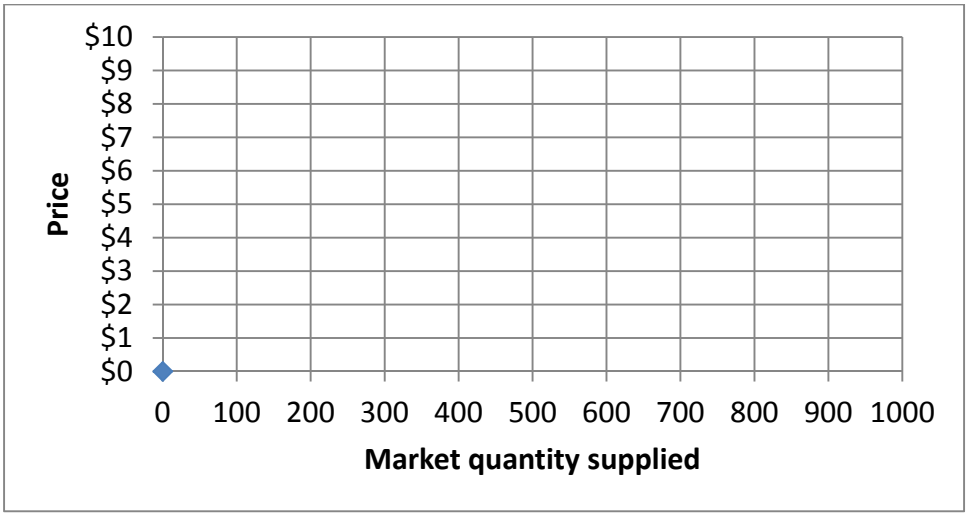
b. Find an expression for Acme's average cost function.

MC(q) =
AC(q) =

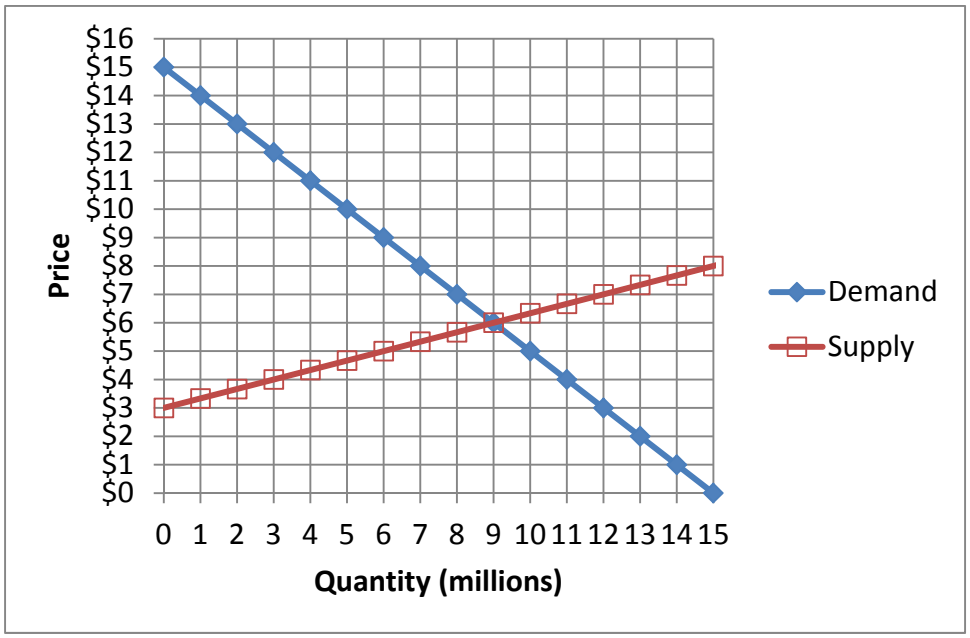
c. Compute Acme's efficient scale q_{ES}. Show your work and circle your final answer.

d. Compute Acme's breakeven price—the minimum price at which it can avoid losses. Show your work and circle your final answer.

e. Suppose all firms in this industry have these same costs, and their costs are not affected by other firms in the same industry or by total industry output. Further assume the industry enjoys free entry and exit. Draw the *long-run <u>industry</u> supply curve* clearly in the graph below.

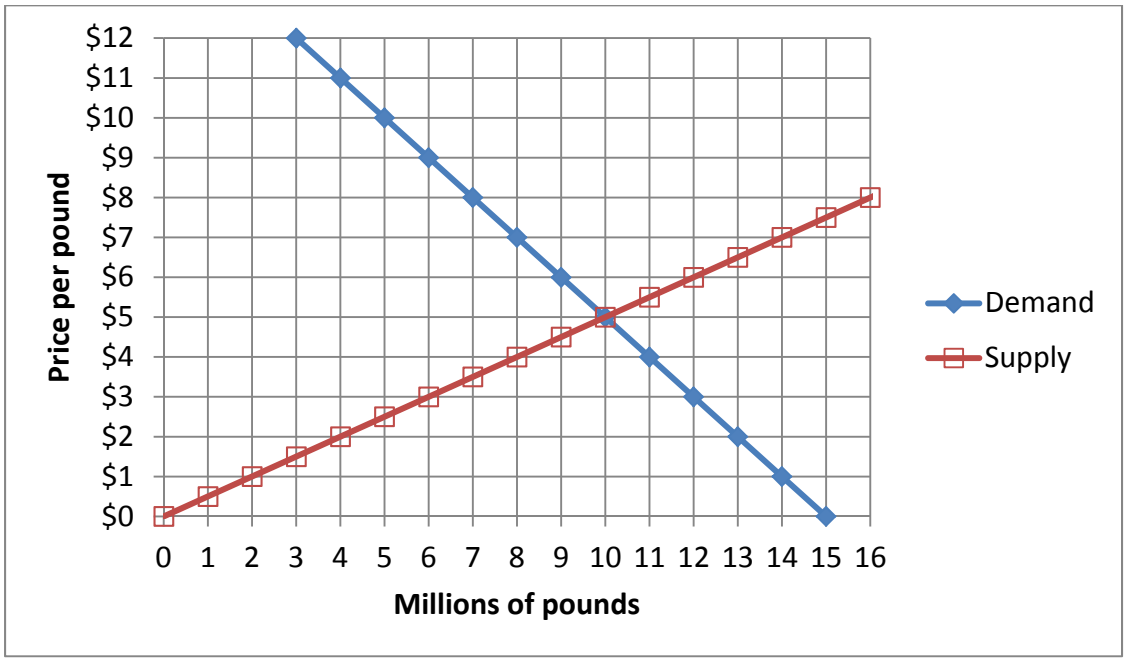


(5) [Consumer surplus, producer surplus: 12 pts] The market for pencil sharpeners is depicted in the graph below. Assume the market is in competitive equilibrium.



a. How much are consumers willing to pay for the 6 millionth sharpener?	$
b. How much consumer surplus do they enjoy for the 6 millionth sharpener?	$
c. What is the marginal cost to producers of the 3 millionth sharpener?	$
d. How much producer surplus do they enjoy for the 3 millionth sharpener?	$
e. Compute total consumer surplus.	$ million
f. Compute total producer surplus.	$ million

(6) [Welfare analysis of price controls: 18 pts] The following graph shows the market for tomatoes.



a. Find the equilibrium price without government intervention. | $

Suppose the government imposes a price floor (or legal minimum price) of **$ 7** per pound. No tomatoes may be sold for a price less than the price floor.

b. How many pounds of tomatoes will actually be sold? | million pounds

c. Will there be *excess demand*, *excess supply*, or *neither*? |

d. How much? | million pounds

e. Does producer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention? (Assume optimistically that tomatoes are sold by those producers with the lowest cost.) |

f. By how much? | $ million

g. Does consumer surplus *increase*, *decrease*, or *remain constant* because of the price floor, as compared to the market without government intervention? |

h. By how much? | $ million

i. Compute the deadweight social loss caused by the price floor. | $ million

III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling. [5 pts]

(1) Suppose the market elasticity of demand for furniture is -1.5 and ABC Company's market share is 5%. If the other furniture makers keep their output constant, will ABC Company perceive the demand for its own output to be *more elastic* or *less elastic* than the market as a whole? Why? Compute the elasticity of demand that ABC Company perceives. (Ignore the graph below.)

(2) Assume that total revenue in an industry is initially $1 million, the supply curve for this industry is perfectly elastic, and the elasticity of demand is -2. Now suppose some government restriction such as a price floor causes the market price to rise by 5 percent. Compute the percent change in quantity and the deadweight loss (in dollars) from this restriction. Show your work and circle your final answer. Illustrate your reasoning using a graph (label axes).

[end of exam]