ECON 120 - Regulation & Antitrust Policy
Drake University, Spring 2026
William M. Boal

Signature: _____

Printed name: _____

FINAL EXAMINATION VERSION B

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. Maximum total points are 200.

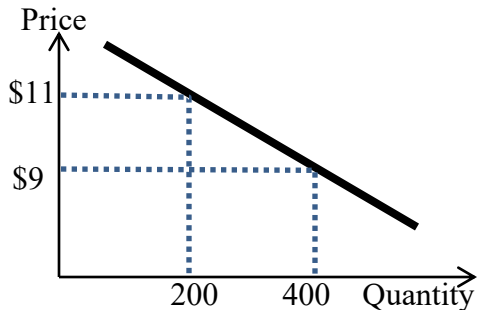
I. Multiple choice: Please circle the one best answer to each question. [2 pts each, 44 pts total]

(1) The purpose of price and entry regulation is primarily to
a. promote competition.
b. control monopoly.
c. limit externalities.
d. remedy problems of asymmetric information.

(2) A good that has no close substitutes will likely have a price elasticity of demand that is
a. small, in absolute value.
b. large, in absolute value.
c. zero.
d. infinite.
e. cannot be determined.

(3) *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.

The next two questions refer to the following graph of the market for movie tickets.



(4) How much are consumers willing to pay for the 200th movie ticket?
a. zero.
b. $2.
c. $9.
d. $11.
e. $20.

(5) If the market price of movie tickets rises from $9 to $11, then total consumer surplus
a. decreases by $400.
b. decreases by $600.
c. decreases by $800.
d. increases by $400.
e. increases by $600.
f. increases by $800.

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(6) An industry is a natural monopoly if
a. the industry became a monopoly without government interference.
b. the only seller in the market sells a natural or "green" product.
c. one firm owns all the key natural resources required to produce the product.
d. a firm's average cost is negatively related to its quantity.

(7) Suppose a coffee shop sells 20 cups of specialty coffee if the price is $3, and sells 21 cups of the same coffee if the price is $2.95. The shop's marginal revenue of the 21st cup is therefore
a. $0.05 .
b. $1.95 .
c. $2.20 .
d. $2.95 .
e. $3.00 .
f. $20.00 .

(8) An action by a firm that is *per se* illegal
a. is always illegal regardless of circumstances.
b. may be illegal if it appears to lessen competition.
c. may be illegal if it increases the firm's profit.
d. may be illegal if it decreases other firms' profits.

(9) Which market model predicts the highest equilibrium price?
a. Price competition.
b. Collusion to maximize joint profits.
c. Cournot oligopoly.
d. All models predict the same equilibrium price, if all use the same assumptions about market demand and marginal cost.

(10) Although profits are greater in more highly concentrated industries, social welfare may also be greater in such industries, according to the
a. permanent income hypothesis.
b. collusion hypothesis.
c. differential efficiency hypothesis.
d. Bertrand model of price competition.

(11) The law that prohibits mergers if the effect is "substantially to lessen competition, or to tend to create a monopoly" is the
a. Sherman Act Section 1.
b. Sherman Act Section 2.
c. FTC Act Section 5.
d. Clayton Act Section 7.

(12) Suppose a monopolist sells a software application that includes a component sold to it by a different monopolist. If the two monopolists merge then their total profit would
a. rise and the price of the software would rise.
b. fall but the price of the software would rise.
c. rise but the price of the software would fall.
d. fall and the price of the software would fall.
e. remain constant and the price of the software would remain constant.
f. Cannot be determined from information given.

(13) Examples of vertical restraints do *not* include
a. tying.
b. exclusive dealing.
c. resale price maintenance.
d. predatory pricing.
e. territorial restraints.

(14) One remedy for monopolization is to break up the firm, as was done in the case of
a. Standard Oil v. U.S (1911).
b. U.S. v. U.S. Steel (1920).
c. U.S. v. Alcoa (1945).
d. U.S. v. United Shoe Machinery (1953).
e. Utah Pie v. Continental Baking (1967).
f. Berkey Photo v. Kodak (1979).

(15) Predatory pricing can be profitable only if predation is followed by a period of
a. accommodation.
b. losses.
c. competition.
d. recoupment.
e. price discrimination.

(16) Most observers agree that the task for antitrust in the *new economy* is
a. to prevent markets from becoming too concentrated.
b. to ensure that prices are close to marginal cost.
c. to prevent dominant firms from stifling challenges by new entrants.
d. to minimize disruption to markets.
e. all of the above.

(17) The principle that a regulated firm "is entitled to ask for a fair return" on investment was established by the Supreme Court in the case of
a. Standard Oil v. United States.
b. United States v. United Shoe.
c. Nebbia v. New York.
d. Smyth v. Ames.

(18) The table below shows a firm's total cost for producing different combinations of outputs. Does this firm enjoy *economies of scope* ?
a. Yes.
b. No.
c. Cannot be determined from information given.

Output	Total cost
500 lawn mowers	$50,000
1000 rakes	$5,000
500 lawn mowers and 1000 rakes	$60,000

(19) In Ramsey pricing, as in market-segmenting price discrimination, the market segment with less-elastic demand gets
a. the smaller price-cost margin.
b. the larger price-cost margin.
c. the same price-cost margin, assuming marginal costs are identical.
d. cannot be determined from information given.

(20) Under traditional rate-of-return regulation, prices are set so that the utility's revenue equals its expenses, plus the allowed rate of return times the
a. value of the utility's outstanding stock.
b. utility's rate base.
c. utility's payroll.
d. total cost.

(21) Under price-cap regulation, the utility's prices are set
a. to match the price of hats.
b. to match those of its competitors.
c. to increase with the rate of inflation, less adjustments for industry productivity growth.
d. to cover the utility's expenses plus an allowed rate of return on the rate base.

(22) Even if a wholesale electricity market is functioning perfectly, the price of electricity may be higher in one location than others if
a. that location has fewer generators than others.
b. that location has greater demand for electricity than others.
c. transmission lines going into that location are at maximum safe capacity.
d. that location does not use peak-load pricing for retail customers.

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 laundry detergent is **-1.5**. Suppose laundry soap producers cooperate to **decrease output by 9%.** Assume the demand curve does not shift.

a. Is demand for laundry soap elastic, inelastic, or unitary-elastic?	
b. Will the price of laundry soap *increase or decrease*?	
c. ... by about how much?	%
d. Will revenue received by laundry soap producers *increase or decrease?*	
e. ... by about how much?	%

(2) [Monopoly, markup formula, Lerner index: 4 pts] Slippery Ski Hill enjoys a local monopoly. Its marginal cost per customer is $8.00. The management believes the elasticity of demand for admission is -5.

a. What admission price should Slippery set, to maximize profit?	$
b. Compute Slippery's Lerner index of market power [(P-MC)/P].	

(3) [Cournot duopoly: 14 pts] Suppose a market is served by only two firms: Acme Products Company and Best Products Company. Suppose the two firms form a *symmetric Cournot duopoly*, each firm setting its own quantity while taking the other firm's quantity as given. Let q_A = Acme's quantity and q_B = Best's quantity, so that total market quantity $Q = q_A + q_B$. The market demand curve is **P = 20– (Q/10).** Each firm has constant marginal and average cost equal to **$2**. Circle your final answers. Use the space at the bottom of the next page for scratch work.

a. Find an expression for Acme's revenue, as a function of its own quantity and the quantity produced by the other firm: $TR_A(q_A,q_B)$. [Hint: By definition, $TR_A = P\ q_A$. Here, replace P by the equation for the demand curve, and then replace Q by $(q_A + q_B)$.]

b. Find an expression for Acme's marginal revenue, as a function of its own quantity and the quantity produced by the other firm: $MR_A(q_A,q_B)$. [Hint: $MR_A = dTR_A / dq_A$.]

c. Find an expression for Acme's reaction function (or best reply function), showing how much Acme will produce for any given level of quantity set by the other firm: $q_A^* = f(q_B)$. [Hint: Set $MR_A = MC$ and solve for q_A as a function of q_B .]

d. Assume the equilibrium is symmetric (that is, assume $q_A^* = q_B^*$) and compute Acmes's equilibrium quantity q_A^*.

Question continues on next page.

e. Compute total market quantity Q* and the equilibrium price P*.

f. Compute the Lerner index (or "price-cost margin," (P-MC)/P).

g. Compute the social deadweight loss from Cournot duopoly.

(4) [Joint profit maximization: 10 pts] Suppose the two firms in the previous problem form a cartel to maximize the sum of their profits. Show your work and circle your final answers.

a. Find the cartel's marginal revenue function.

b. Compute the cartel's profit-maximizing level of output Q*.

c. Compute the cartel's profit-maximizing price P*.

d. Compute the cartel's Lerner index (or "price-cost margin," (P-MC)/P).

e. Compute the social deadweight loss from the cartel.

(5) [Equilibrium entry: 14 pts] Suppose annual demand for wheelbarrows is given by P = 70 – Q, marginal and average cost is **$10**, and the market is a symmetric Cournot oligopoly. It can be shown that the equilibrium market price and quantity depends on the number of firms as follows.

Number of firms	Equilibrium market quantity	Equilibrium market price	Quantity per firm	Annual profit per firm	PDV profit per firm
1	30	$40	30	$	$
2	40	$30	20	$	$
3	45	$25	15	$	$
4	48	$22	12	$	$
5	50	$20	10	$	$

a. [5 pts] Compute the annual profit per firm when the number of firms ranges from 1 through 5. Insert your answers in the table above.
b. [5 pts] Suppose this annual profit continues indefinitely and the firms' discount rate is **10%**. Compute the present discounted value of profit per firm when the number of firms ranges from 1 through 5. Insert your answers in the table above. [Hint: The present discounted value of a perpetual annual payment of X at discount rate r is given by X/r.]

c. [2 pts] What is the equilibrium number of firms in this industry when the upfront cost of entry is $3000?
d. [2 pts] What is the equilibrium number of firms in this industry when the upfront cost of entry is $1200?

firms
firms

(6) [Upward pricing pressure: 8 pts] Suppose initially Firm A has 40% market share and Firm B has 30% market share. Assume that all customers buy from *some* firm in this market.

a. Compute an estimate of the diversion ratio D_{AB} –that is, the number of units lost by Firm B when Firm A sells one more unit.
b. Compute an estimate of the diversion ratio D_{BA} –that is, the number of units lost by Firm A when Firm B sells one more unit.

Further assume the following.

- Firm A's price and marginal cost are $25 and $17 respectively.
- Firm B's price and marginal cost are $20 and $14, respectively.
- It is estimated that a merger would lower Firm A's marginal cost to $15.

Suppose Firms A and B were to merge. Compute the consequences for **Firm A**'s pricing.

c. Compute the upward pricing pressure on Firm A caused by the merger (UPP_A).
d. Compute the hypothetical value of efficiencies (that is, the decrease in Firm A's marginal cost) that would be required to reduce UPP_A to zero.

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$

(7) [HHI and merger guidelines: 12 pts] Suppose the market shares of the firms in an industry are as follows.

Firm	A	B	C	D	E	F	G	H	I
Market share	20%	20%	10%	10%	10%	10%	10%	5%	5%

a. Compute the current value of the Hirschman-Herfindahl index.

b. Under the 2023 DOJ-FTC *Merger Guidelines*, would this industry be classified as "highly concentrated"? Answer YES or NO.

Now suppose Firm A were to merge with Firm B.

c. Compute the postmerger value of the Hirschman-Herfindahl index.

d. Under the 2023 *Merger Guidelines*, would this industry now be classified as "highly concentrated"? Answer YES or NO.

e. On the basis of these calculations alone, under the 2023 *Guidelines*, would this merger be presumed to be illegal? Why?

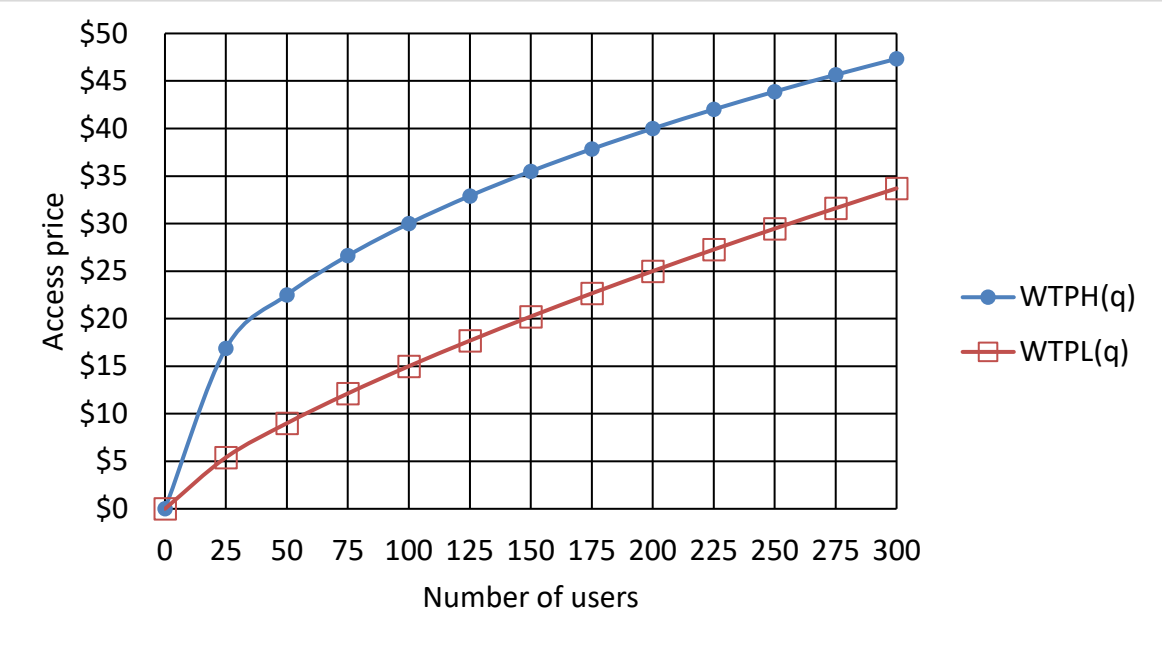
(8) [Price discrimination: 6 pts] Suppose a monopoly believes its Blue customers have an elasticity of demand for its product equal to -6, and its Green customers have an elasticity of -3. The marginal cost of the product to either segment is $10.

a. To maximize profit, which market segment should get the *lower* price?

b. Compute the profit-maximizing price for Blue customers. $

c. Compute the profit-maximizing price for Green customers. $

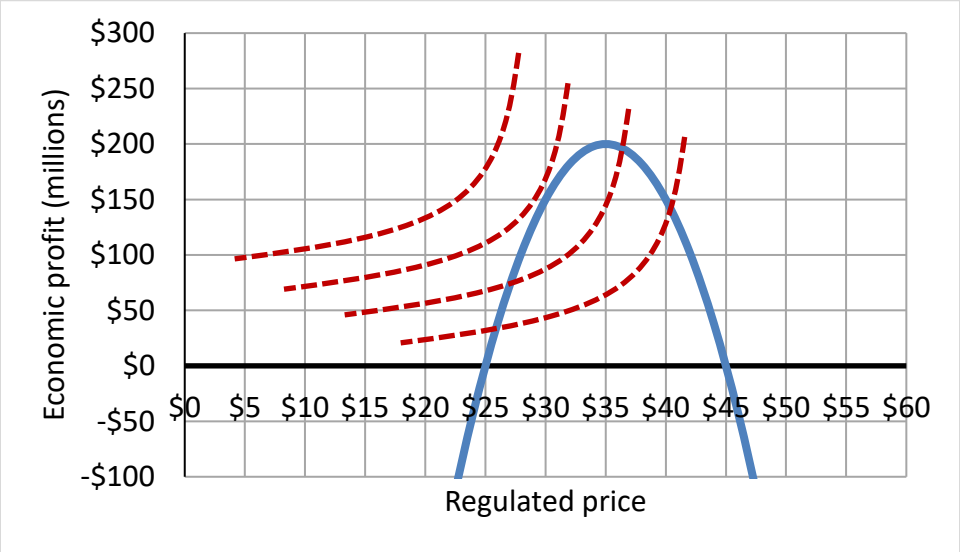
(9) [Network effects: 8 pts] The following graph shows *willingness to pay* for access to a network for *two representative users*, a high-intensity user (WTPH) and a low-intensity user (WTPL). Assume there are 100 potential users of each type.



a. Explain why these curves slope upward.

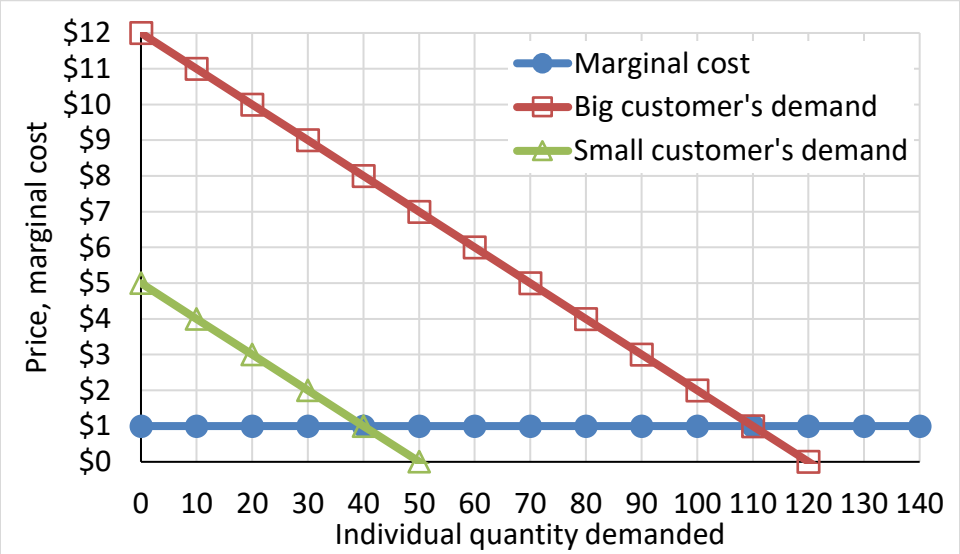
b. What range of access prices (P) would be compatible in equilibrium with **no users** on the network?	$ < P < $
c. What range of access prices would be compatible in equilibrium with **100 users** on the network?	$ < P < $
d. What range of access prices would be compatible in equilibrium with **200 users** on the network?	$ < P < $

(10) [Positive theories of regulation: 6 pts] The graph below shows the economic profit function of a regulated industry as a solid curve, and the indifference curves of the regulator as dashed curves. The regulator's indifference curves slope up because the regulator gets support from consumers by keeping prices low, and gets support from the regulated industry by keeping economic profit high. Assume average cost is constant and equal to marginal cost.



a. According to the capture theory of regulation, what price will the regulator set?	$
b. According to the public-interest theory of regulation, what price will the regulator set?	$
c. According to the Stigler-Peltzman theory of regulation, what price will the regulator set?	$

(11) [Multipart tariffs: 26 pts] Suppose a regulated firm has a marginal cost (= average variable cost) of **$ 1**. In addition to the marginal cost shown in the graph below, the firm has "fixed" or overhead costs of **$ 200** million per month. The firm serves both big customers and small customers. Their representative individual monthly demand curves are also shown in the graph.



Consider two alternative tariffs:

(i) **Two-part tariff**. Each customer must pay an entry fee (or monthly charge) of **$ 200** and a per-unit usage charge of **$ 1** per unit.

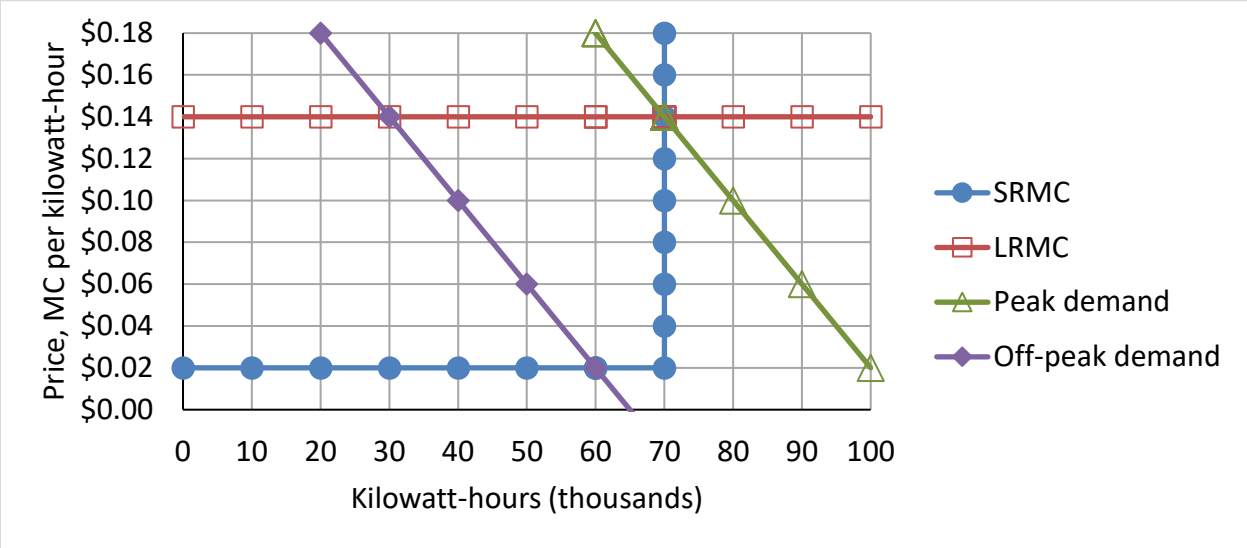
(ii) **Declining-block tariff.** Each customer must pay **$ 3** per unit for the first **80** units purchased, and **$ 1** per unit thereafter.

Assume there are one million big customers and one million small customers. Compute the following.

	(i) Two-part tariff	(ii) Declining-block tariff
a. What quantity would a typical big customer buy?	units	units
b. What quantity would a typical small customer buy?	units	units
c. Compute the firm's total revenue.	$ million	$ million
d. Compute the firm's total cost (including the "fixed" cost).	$ million	$ million
e. Does the firm make a *profit*, a *loss*, or just *break even*?		
f. Compute the social deadweight loss from this pricing policy.	$ million	$ million

g. Which of these tariffs do you favor? Why?

(12) [Peak-load pricing: 22 pts] Suppose cost and demand for electricity are given by the following graph. Costs are shown as short-run marginal cost (SRMC) and long-run marginal cost (LRMC) curves. LRMC includes the cost of building new capacity. Demands are shown as peak demand and off-peak demand. Assume for simplicity that peak and off-peak periods are the only periods, and they are of equal duration.



a. Explain in words why SRMC bends up vertically at **70** thousand kilowatt hours.

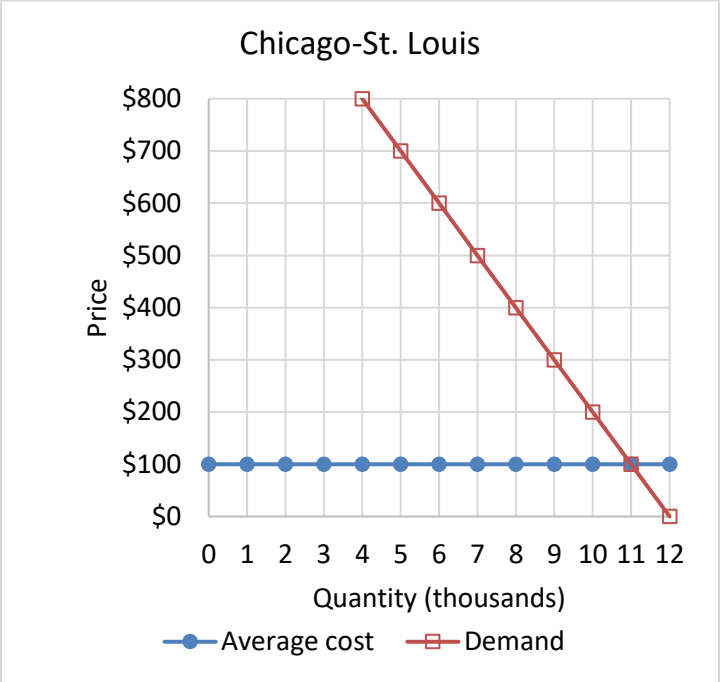
First, suppose efficient peak-load pricing is used.

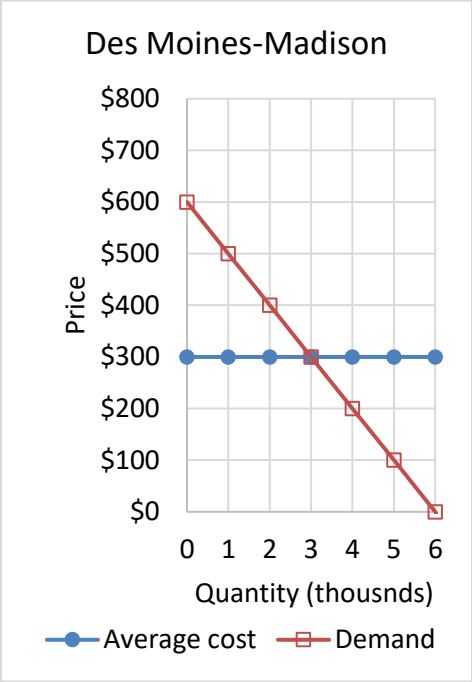
b. Find the price of electricity during the peak period.	$ per kWh
c. Find the quantity of electricity demanded during the peak period.	thousand kWh
d. Find the price of electricity during the off-peak period	$ per kWh
e. Find the quantity of electricity demanded during the off-peak period.	thousand kWh

Now suppose instead a uniform price of **$ 0.10** per kilowatt-hour is used in both peak and off-peak periods.

f. Find the quantity of electricity demanded during the peak period.	thousand kWh
g. Find the quantity of electricity demanded during the off-peak period.	thousand kWh
h. Would generation capacity have to *increase, decrease*, or *stay the same* to accommodate uniform pricing?	
i. By how much?	thousand kWh
j. In the graph above, shade the areas representing social deadweight loss from uniform pricing.	
k. Compute the social deadweight loss from uniform pricing.	$ thousand

(13) [Cross-subsidization: 12 pts] The following graphs show the demands and average costs for air travel between Chicago and St. Louis, and between Des Moines and Madison. Assume that average cost equals marginal cost. Average cost per passenger is lower in the Chicago-St. Louis market because larger planes can be used.





Suppose a regulated airline is required to set the airfare between Des Moines and Madison at **$100**.

a. Compute the social deadweight loss in the Des Moines-Madison market from this pricing policy. $ thousand

b. Compute the loss that the airline will experience in the Des Moines-Madison market from this pricing policy. $ thousand

Suppose the regulated airline is permitted to recover its loss in the Des Moines-Madison market by raising price above average cost in the Chicago-St. Louis market.

c. What is the lowest price in the Chicago-St. Louis market that would allow the airline to recover its loss in the Des Moines-Madison market? $

d. Compute the social deadweight loss in the Chicago-St. Louis market from this pricing policy. $ thousand

e. Shade both areas of deadweight loss in the graphs above.

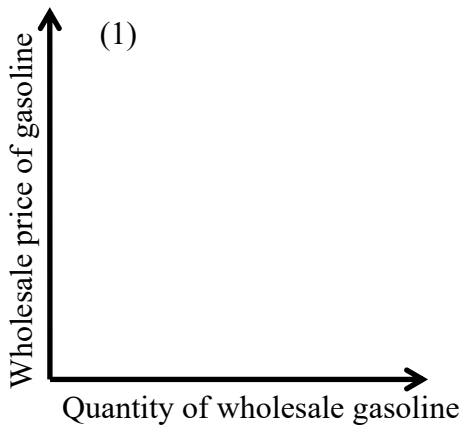
f. Compute the social loss from regulation with cross-subsidization—that is, the social deadweight loss in the Des Moines-Madison market plus the social deadweight loss in the Chicago-St. Louis market. $ thousand

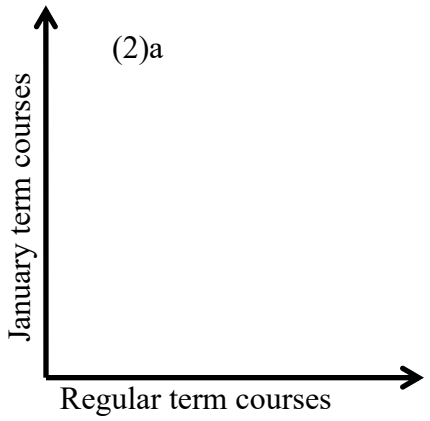
III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

(1) Suppose a gasoline producer (like *Phillips* or *Shell*) merged with a gasoline distributor (like *Kum and Go* or *Casey's*). Assume both markets are competitive before and after the merger. Would the combined firms' profit likely increase or decrease? Why? Would social welfare increase or decrease? Why? Illustrate your answer with a supply-and-demand graph of the wholesale market for gasoline.

(2) The same classrooms at Drake University are used both for regular-term courses and for January-term courses. These classrooms are always occupied during the regular term but are mostly empty during the January term.
   a. Are Drake classrooms a *joint cost* or a *common cost* [i] for regular-term courses and January-term courses? Why? Justify your answer and illustrate it with a production-possibility curve below. [Hint: the shape is important.]
   b. Assume that Drake wants to set tuition so as to price courses at marginal cost. Should the cost of classrooms be included in regular-term tuition only, in January-term tuition only, or both? Why?

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]

[i] Use Kahn's definitions of *common cost* and *joint cost*. Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions*, Volume 1, New York: Wiley, 1970, pp.78-79.