Econ 101
Final Exam
December 11, 2012

Write all answers on the exam. Show all of your work. The exam ends at noon.

1. Read all of parts (a)-(e) before you answer any of them.

Suppose that the market for potatoes is perfectly competitive, generates no externalities, and is free of government intervention.

(a) (5pts) In the space below, draw a graph of the industry supply and demand for potatoes. Be sure to label your axes.   On your graph, indicate the equilibrium price, labeling it P, and the equilibrium quantity, labeling it Q.

Now suppose the government gives potato producers a subsidy of 20 cents per pound of potatoes sold.

(b) (4pts) What happens to the industry supply curve as a result of the subsidy? Be as explicit as possible in your answer, and explain your answer.

(c) (4pts) What happens to the industry demand curve as a result of the subsidy? Be as explicit as possible in your answer, and explain your answer.

(d) (8pts) On your graph from part (a), show the effect of the subsidy. Label the new quantity Q' and the new price P'. On your graph, show the dead-weight loss that results from the subsidy.

(e) (4pts) How much does the subsidy cost the government?

2. Suppose mozzarella is produced in perfectly competitive markets that generate no externalities. Consider a small country open to trade with the rest of the world. Local residents produce some mozzarella, and the country also imports mozzarella. There is no government intervention in the mozzarella market. Read parts (a)-(c) before you answer any of them.

(a) (15pts) On a graph of domestic supply and demand for mozzarella, indicate the world price of mozzarella (labeling it P_w), the quantity produced domestically (labeling it $Q_{Sdomestic}$), the quantity demanded by domestic residents (labeling it $Q_{Ddomestic}$), and the quantity of mozzarella imported.
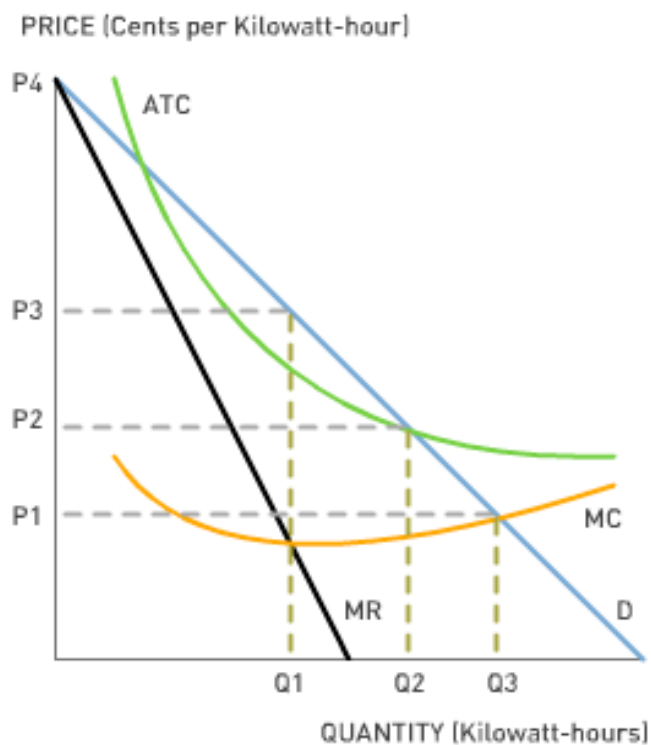
Suppose now that the government imposes a tariff on mozzarella imports equal to $2 per pound. With the tariff in effect, the country is still an importer of mozzarella.

(b) (5pts) Explain what happens to the domestic price of mozzarella as a result of the tariff.

(c) (15pts) On your graph from part (a), show the effect of the tariff. Indicate the new quantity produced domestically (labeling it $Q'_{Sdomestic}$), the new quantity demanded by domestic residents (labeling it $Q'_{Ddomestic}$), and the new quantity of mozzarella imported. On your graph, indicate the tax revenue raised by the tariff and the dead-weight loss caused by the tariff.

3. (a) (5pts) Define a natural monopoly.

The following graph shows the demand (D) for electricity services in a particular town. The graph also shows the marginal revenue (MR) curve, the marginal cost (MC) curve, and the average total cost (ATC) curve for the local electricity company, a natural monopolist. Assume there are no externalities in this market.

PRICE (Cents per Kilowatt-hour)

[Graph showing demand (D), marginal revenue (MR), marginal cost (MC), and average total cost (ATC) curves. The vertical axis shows prices P1, P2, P3, P4 and the horizontal axis shows quantities Q1, Q2, Q3. The ATC curve is green, the D curve is blue, the MR curve is black, and the MC curve is orange.]
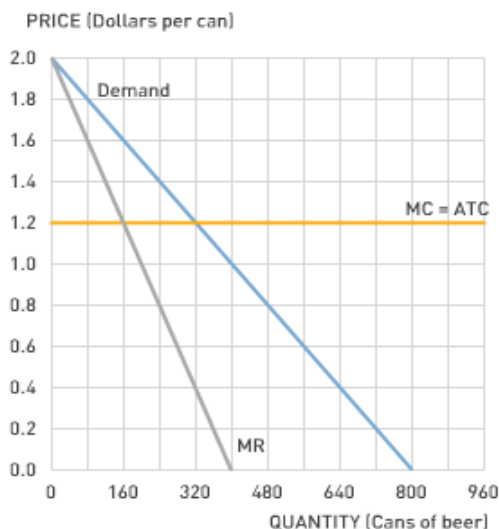
QUANTITY (Kilowatt-hours)

Suppose this monopolist is free of regulatory intervention, so that it can choose its quantity and price. Suppose it cannot price discriminate, so it must charge all customers the same price. Assume its goal is to maximize its profit.

(b) (10pts) This monopolist would maximize profit by choosing a quantity of _____ and charging price _____.

(c) (15pts) On the graph, indicate the area of the monopolist's profit, the area of total consumer surplus, and the area of the the dead-weight loss.

4. Suppose that Mays and Covey are two beer-brewing companies that produce an identical product for which there are no close substitutes. The market for canned beer is an oligopoly composed of only these two firms. Neither firm has any fixed costs of production. For both firms, the daily marginal cost (MC) of producing a can of beer is constant and is $1.20 per can. Thus, marginal cost equals average total cost (ATC) for each firm. Suppose that the daily market demand is given in the graph below. Each day, each firm independently and simultaneously chooses how many cans of beer to produce. The price that day is the single highest price that customers will pay for that total quantity of beer. Assume there are no externalities in this market.

PRICE (Dollars per can)

[Graph: Demand curve starting at price 2.0 at quantity 0, sloping down to 0 at quantity 960. MR curve (steeper, gray) from 2.0 at quantity 0 to 0 at quantity 480. MC = ATC horizontal line at price 1.2. X-axis QUANTITY (Cans of beer) marked 0, 160, 320, 480, 640, 800, 960. Y-axis PRICE marked 0.0 to 2.0 in increments of 0.2.]

(a) (20pts) Suppose that Mays and Covey form a cartel, agreeing to each produce half of the quantity a profit-maximizing monopolist would produce. The cartel agreement would have each firm each day producing _____ cans of beer so that the market price would be _____. Each day each firm would earn profits of _____, the total industry profits would be _____, total consumer surplus would be _____, and the dead-weight loss would be _____.

(b) (15pts) Consider what would happen if one day Covey decided to cheat on the cartel agreement. If Mays keeps its part of the agreement, but Covey produces 50% more than Covey's agreed-on quantity, then that day Covey would produce _____, the total industry output would be _____, the market price would be _____, Covey would earn profits of _____, Mays would earn profits of _____, total industry profits would be _____, total consumer surplus would be _____, and the dead-weight loss would be _____.

(c) (12pts) Suppose the government busts up this cartel and encourages entry into this market, making the market perfectly competitive. Like Mays and Covey, the new firms have no fixed costs and have constant marginal costs of $1.20 per can of beer. In the competitive equlibrium the price is _____, the total quantity produced is _____, total industry profits are _____, total consumer surplus is _____, and the dead-weight loss is _____.

(d) (3pts) From the point of view of customers is it better to have the cartel, the cartel with a member cheating, or perfect competition? Use the space on the top of the next page to explain your answer.

5. (a) (3pts) Define a negative externality.

(b) (3pts) Define a positive externality.

(c) (3pts) Suppose that mosquito nets are produced in a perfectly competitive industry. In the space below, draw the industry supply and demand diagram for mosquito nets. Be sure to label your axes. On your diagram, label the quantity produced in the perfectly competitive industry Qpc.

The use of mosquito nets reduces the spread of malaria. So, when someone buys a mosquito net, other members of society benefit from that purchase because they are less likely to become ill.

(d) (6pts) On your diagram from part (c), draw the marginal social benefit curve. On your diagram from part (c), label the socially optimal quantity Qoptimal.

(e) (5pts) In words, explain why the perfectly competitive quantity of mosquito nets is not the optimal quantity from society's perspective.

(f) (5pts) On your diagram from part (c), indicate the dead weight loss if the perfectly competitive quantity of output is produced.

6. (a) (5pts) Define the tragedy of the commons.

Consider our Aplia experiment from December 3.

(b) (4pts) In the first round of the experiment, with free access to fishing, did the tragedy of the commons result? Why or why not?

In Rounds 2-4 of the experiment, the government regulated the fishery by requiring licenses for anyone who fished and by limiting the number of licenses. In Round 2, the government awarded the licenses by lottery at the beginning of the year. In Round 3 the government awarded the licenses by lottery at the beginning of each month. In Round 4 the government auctioned the licenses to the highest bidders at the beginning of each month. In each of the rounds with licenses, the government issued the same number of licenses, so the total amount of food consumed was roughly the same across these rounds.

(c) (4pts) In the rounds with fishing licenses did the tragedy of the commons result? Why or why not?

(d) (4pts) Each method of distributing fishing licenses led to a different distribution of food among the members of the community. What were the relative merits of each method of distributing licenses?

7. A public good is not excludable and is non-rival in consumption.

(a) (3pts) What does excludable mean?

(b) (3pts) What does non-rival in consumption mean?

(c) (3pts) Give an example of a public good.

The following matrix describes the strategic situation two people find themselves in as they simultaneously and independently decide whether or not to contribute to funding a public good. Player 1's payoffs are located in the bottom left of each cell. Player 2's payoffs are located in the top right of each cell. After the players make their decisions they have no further interaction with each other.

Public Good Game

Player 2

		Contribute	No
Player 1	Contribute	10 / 10	12 / 0
	No	0 / 12	0 / 0

(d) (3pts) List the Nash equilibria of this public good game.

(e) (3pts) Define a Nash equilibrium.

(f) (3pts) Describe the free-rider problem in the funding of this public good.