Instructions: This problem set is due in class on Wednesday, October 13. If you get stuck, you are encouraged to ask questions of the instructor or the tutors. Jeff has office hours Friday 1:00–2:00pm, Monday 3:00–4:00pm, and Tuesday 10:0–11:00am in Vollum 229. Tutors will be available at work sessions Monday and Tuesday 7–10pm in the Dorothy Johansen House. Individual tutoring (at no cost for up to one hour per week) can be arranged through the Office of Student Services.

1. Regulation of Monopoly. Regulus Grimm is a city planner in Reelihumid, Georgia, a medium-sized city. The city is considering a proposal to award an exclusive contract to Clear Vision, Inc., a cable television carrier. Mr. Grimm has discovered that an economic consultant hired a year before has generated the demand, marginal revenue, total cost and marginal cost functions given below:

$$\text{Demand: } P = 28 - 0.0008Q$$

$$\text{Marginal revenue: } MR = 28 - 0.0016Q$$

$$\text{Total Cost: } TC = 120{,}000 + 0.0006Q^2$$

$$\text{Marginal Cost: } MC = 0.0012Q,$$

where Q = the number of cable subscribers and P = the price of basic monthly cable service. Conditions change very slowly in Reelihumid so that Mr. Grimm considers the cost and demand functions to be reasonably valid for present conditions. Mr. Grimm knows relatively little economics and has hired you to help formulate a regulatory policy based on this information. Use both graphs and numbers to present your answers.

  a.   What price and quantity would be expected if CVI is allowed to operate completely unregulated?
  b.   Mr. Grimm has asked you to recommend a price and quantity that would be socially efficient. Recommend a price and quantity to Mr. Grimm using economic theory (in graphs and simple language) to justify your answer.
  c.   Compare the economic efficiency implications of (a) and (b) above. How much would the citizens gain if the optimal regulation is imposed? How much would CVI lose?

2. Regulation. The MegaZap Electric Company produces and distributes electricity to residential customers in the metropolitan area. This monopoly firm is regulated, as are other investor owned electric companies. The company faces the following demand and marginal revenue functions:

$$P = 0.04 - 0.01Q$$

$$MR = 0.04 - 0.02Q$$

 Its marginal cost function is:

$$MC = 0.005 + 0.0075Q,$$

where Q is in millions of kilowatt hours and P is in dollars per kilowatt hour.

a. How much will MegaZap produce and what price will it charge if it is unregulated?

b. What would be the efficient price and quantity? Is it feasible for a well-informed regulator to set this price?

c. How much additional social benefit will be achieved through regulation? Regulation is not free; analysts and monitors must be paid. What is the most that the citizenry should pay to regulate MegaZap?

3. Price Discrimination. Calloway Shirt Manufacturers sells knit shirts in two sub-markets. In one market, the shirts carry Calloway's popular label and breast logo and receive a substantial price premium. The other sub-market is targeted toward more price conscious consumers who buy the shirts without a breast logo, carrying the name Archwood. The retail price of the shirts carrying the Calloway label is $42.00 while the Archwood shirts sell for $25. Calloway's market research indicates a price elasticity of demand for the higher priced shirt of –2.0, and an elasticity for the Archwood shirts of –4.0. Moreover, the research suggests that both elasticities are constant over broad ranges of output.

a. Are Calloway's current prices optimal? Why or why not?
b. Management considers the $25 price to be optimal and necessary to meet the competition. What price should the firm set for the Calloway label to achieve an optimal price ratio?

4. Efficiency of Monopoly and Price Discrimination. The industry demand curve for a particular market is:

$$Q = 1800 - 200P.$$

The industry exhibits constant long-run average cost of $1.50 per unit at all levels of output, regardless of the market structure. Calculate market output, price (if applicable), consumer surplus, and producer surplus (profit) for each of the scenarios below. Compare the economic efficiency of each possibility.

a. Perfect Competition
b. Pure Monopoly   (hint: $MR = 9 - 0.01Q$)
c. First-Degree Price Discrimination