There are 11 problems on this test and 3 extra credit opportunities. You must answer problems 1-3, 8, and 9. You may choose to answer 4 or 5, 6 or 7, and 10 or 11. Thus each person will answer a total of 8 problems. Please read the problems carefully and label all of your graphs. You have 180 minutes to finish this test. Good luck and enjoy the summer!

1. (8) The first problem involves an oligopoly market. Suppose there are only two firms in the market, each having the same cost functions.
   a. (3) Assuming you have a Cournot Model, explain why the firms will fail to achieve the collusive outcome (you can use numbers and a box-form game if it helps you).

   In a Cournot Model, the collusive outcome would be if both firms produced 1/2 of the monopoly quantity. If one firm is producing 1/2 of the monopoly quantity, then the other firm has a profit incentive to produce more than 1/2 the monopoly quantity. Thus each firm has an individual incentive to produce more. This is an example of the prisoner’s dilemma that we discussed in class. If each firm pursues its own profit maximizing motives, then the Nash Equilibrium will be at a quantity greater than the collusive outcome (we also saw this visually with the reaction functions).

   b. (2) Explain the concept of a Nash Equilibrium.

   A Nash Equilibrium is defined as doing the best that you can do given your competitor is doing a specific action. With the Cournot model, each firm has to satisfy that it is choosing the best quantity (or profit maximizing quantity) given that its competitor is choosing a given quantity. The condition must be satisfied for both firms.

   c. (3) Now assume you have a Bertrand Model. Explain how to reach a Nash Equilibrium if the two firms have equal costs.

   We start by examining any given price and ask each firm how to maximize its profits given the other firm is charging a certain price. At any price above average total costs, each firm has a profit incentive to charge a price just below its competitor. Assuming one dollar increments this is true for all prices above average total cost plus one dollar. At the price of average total cost plus one dollar, neither firm has an incentive to lower the price by a dollar because the economic profit will be zero (as opposed to some number greater than zero when price is average total cost plus one dollar). Any price charged below average total cost will yield profits less than zero if any quantity is produced and consumed. This is an example of a Nash Equilibrium in the Bertrand Model because neither firm has an incentive to change what it is doing (given the selection of the other firm).
2. (6) Consider the market for education.
   a. (2) Illustrate the private marginal cost, social marginal cost, private marginal benefit, and social marginal benefit.

\[ (P_0, Q_0) \]
Free market
\[ Q_{-efficient} \]

\[ P \]
\[ PMC = SMC \]
\[ = S \]
\[ SMB \]
\[ PMB = D \]
\[ Q_0 \]
\[ Q \]

b. (2) Label the free market outcome and the efficient outcome for society.

c. (2) Explain why the free market outcome fails to yield the efficient outcome.

The free market outcome is reached by having firms pursue individual profit maximization and consumers pursue individual utility maximization (PMC=PMB). Neither the firms nor the consumers incorporate the additional benefits to society in their decision-making processes. Thus, the outcome of PMC=PMB (free market outcome) will not be the efficient outcome (SMC=SMB).

3. (4) Why does the free market fail in the provision of pure public goods?

A public good is non-excludable and non-rival. Since the good is non-excludable, firms have a difficult time collecting revenue because of the free-rider problem. Consumers know that they can experience the benefits of the good without paying for it because the good is non-excludable. Thus, the firm may not be able to collect the revenue necessary to produce the item (even though the SMB>SMC and PMB>PMC).
Choose either 4 or 5

4. (6) List and explain three factors that can prevent the money market from providing an efficient allocation of resources over time (make sure to fully explain the prevention).

On the surface, the market for money should provide an efficient allocation of resources over time because the market provides an opportunity cost of money (the price of money or interest rate). However, the following features of the market can prevent the interest rate from achieving the efficient result.

First – Government involvement in the market. The government can influence the supply of money without the objective of efficient resource allocation (other incentives include keeping inflation low).

Second – Demanders of money are generally more present looking than future looking, thus overestimating the current marginal benefit of money.

Third – Private risk is greater than societal risk. Risk is a component of the marginal demand for money and the demand for money will only consider private risk and not societal risk in the utility maximizing choice.

Fourth – Irreversible decisions made by current participants could effect efficient allocation over time.

5. (6) Explain the information asymmetries in the used car market. Explain how the consumers can obtain more information and how the producer can signal quality in this market.

In the used car market, the seller usually has more information about the car than the consumer. This is due to the fact that the car has been in the seller’s possession. Consumers can gain more information about the car by test driving it, taking it to a mechanic, looking at websites like www.carfax.com, etc. This can increase the information but will not necessarily make the information symmetric. The seller can offer a warranty in an attempt to signal quality to the consumer. All sellers have a profit incentive to make the car sound like a high quality car. By offering a warranty, the seller does not give any factual information, rather he/she simply signals quality. The consumer believes that a seller would only be willing to offer the warranty if the car is a high quality car.
Choose either 6 or 7

6. (8) List the two sections of the Sherman Antitrust Act and discuss the enforcement of the act over time (make sure to include how the enforcement has changed and why).

First Section – makes every contract or conspiracy in restraint of trade illegal.
Second Section – makes monopoly or attempt to monopolize illegal.

At first this law was pursued rather aggressively. Large trusts such as Standard Oil and US Steel were found guilty and broken up. However, over time the law has been pursued less aggressively. This is in response to judicial interpretation of the law. Judges now consider the behavior of the firm for section 2 instead of looking to see if the market share is large or whether it has been growing. In general the enforcement has changed due to judicial interpretation, new economic theories and ideas (theories of competition and pricing power), and the beliefs of politicians who appoint the Department of Justice and the Federal Trade Commission.

7. (8) Summarize three arguments against the prevention of the proposed merger from the article, “FTC Screams For Antitrust.” Make sure to both list and explain the arguments (drawing from topics we have covered in class about competition would be best).

Answers can vary. One argument is that the premium ice cream market is economically meaningless in antitrust cases. A previous court issued this opinion in its decision. Another argument is that the market has low barriers to entry. With low barriers to entry, a new firm would have a difficult time raising price above costs due to the ease of entry. Any of the store brands can easily change the ingredients of their current ice creams and distribute it to their stores. Any concerns about the merger affecting the distribution network that Dreyers currently has should be ignored because the new company would still have the incentives to continue to carry competitors’ products. By carrying competitors’ products, overhead is still reduced and stores still favor getting a good mix of products. Thus, the profit incentive remains.
   a. (4) List and explain how the author shows that income inequality grew in the 1990’s
      (specific numbers are not necessary, just list and explain the method of showing this).

      The author looks at the percentage of income that went to the top 10% of earners. This number increased
      from 30% in the late 1970’s to 40% in 2000. He also notes that the average of the top 5% of wage earners
      made 11 times as much as the average bottom 20% of workers in the late 1970’s. This increased to 19
      times in 2000. Average CEO pay was 93 times the average production worker in companies in 1988 and
      increased to 419 times in 2000. Once again, numbers are not necessary, just a description of the evidence.

   b. (4) The author referenced two other time periods to compare the rising inequality. How
      did he characterize the government’s policies at the end of those eras versus the
      government’s policies today (references to specific policies and how they affect income
      inequality would be the most appropriate answer)?

      The two other time periods were the late 1800’s and the 1920’s. Government policies such as the
      Sherman Antitrust Act in 1890 were partly in a response to the public recognition of a growing inequality
      between big business and the average consumer. The antitrust legislation was intended to decrease the
      pricing power of big firms, thus reducing profits. This would result in a decrease in income for the rich
      and lower prices for the poor. The New Deal was created partly as a response to the growing inequality
      that occurred in the 1920’s (and the depression that followed the 1920’s). The government actions
      included providing jobs to individuals who had been out of work, thus enabling poor individuals and
      families to increase their incomes. We have yet to see a government response equaling the response to
      the other two eras. In fact, the results of many of the current political discussions, such as the proposed
      tax cut and the elimination of the inheritance tax, are to potentially increase this gap between the rich and
      the poor.

9. (4) Provide an intuitive explanation of an upward sloping labor supply curve (hint: similar to the
      homework question, need to address the person’s choice and what makes him/her happiest).

      If a labor supply curve is upward sloping, then the supplier of work decides to work more with an
      increase in the wage. If this occurs, then the supplier of work must place a greater value on the increase
      in consumption possibilities (increased income) than the leisure he/she is giving up to work.
Choose either 10 or 11

10. (6) Discrimination
   a. (3) Explain how you would try to find evidence of economic discrimination (explain the factors you would examine and whether looking at wages for groups is enough).

In order to find evidence of discrimination he/she must observe different wages paid to individuals after controlling for productivity and job type. I would try to observe workers in similar occupations to control for the job type. In addition, I would use tools such as education, years of job experience, performance reviews, etc. to help me control for productivity differences.

   b. (3) Explain whether economic discrimination is more profitable or less profitable (or possibly both) for the employer.

Technically, it could be either. It would be less profitable if a firm hires workers that are less qualified or less productive than a worker from the discriminated group. It could be more profitable if the consumers also discriminate. If consumers discriminate, then the firm has a profit incentive to provide the product to the specification of the consumer. Please note, this is an analysis of profit and not what ought to nor should be.

11. (6) Explain the objectives of labor unions, how try to accomplish these objectives, and whether they have been successful in the last 50 years.

Labor unions represent the concerns of the employees. Specifically they work to increase the wage, increase benefits, provide job security, provide a safer working environment, provide additional education for their members, etc. They accomplish these tasks by organizing labor to obtain bargaining power. They meet with the employers to discuss contracts and can threaten to strike if the contract is not satisfactory. In addition, unions can make contributions to politicians in an attempt to pass labor friendly legislation. We have data on wages that suggests minimal success. The average union member earns 15% more than the average non-union worker (before dues and after controlling for job type). We also know that union membership as a percentage of the workforce has been declining, suggesting less success. To truly answer this question, we would need data on all of the different objectives of the union (comparing union jobs versus non-union jobs).
Extra Credit 5 Points

1. (1) What is the one climbing trip that I said I wanted to undertake this summer?

Climb North, Middle, and South Sister in one trip.

2. (3) On Monday, May 5th, George Priest wrote an article in the Wall Street Journal criticizing the $3 billion settlement by Mastercard and Visa. List anything you know about the article or the case.

Case against Mastercard and Visa pertained to the fee that companies were charging stores for debit card transactions. The case suggested that the fee would have been different had the stores not been subject to the Honor All Cards Rule. The article criticizes this case for many reasons. One reason is that Mastercard and Visa might have charged card members different fees for debit cards if they were not charging stores. In addition, since the case was able to group customers potentially harmed in to a $40 to $100 billion group, the card company had almost no choice but to settle (because of expected payout). The Honor All Cards Rule has been adopted by all card systems and has been shown to increase efficiency. If card companies decided to halt the practice the consumer would undoubtedly pay a higher price for the card.

3. (1) In 1991, a gentleman from the World Bank issued a controversial memo stating that more waste should be shipped to developing countries in order to get an efficient allocation of waste. This gentleman is a well-known economist, advised Michael Dukakis on his failed Presidential campaign, and is now currently the President of Harvard. Name this gentleman.

Larry Summers