This review sheet is intended to cover everything that could be on the exam. However, it is possible that I may have inadvertently overlooked something. You are still responsible for everything in the chapters covered except anything that I explicitly say you are not responsible for. Therefore, if I left something off of this sheet, it can still be on the exam. There will be no multiple-choice questions. Most of the questions will be like the ones on the homework assignments, and possibly a few definition questions. I am more likely to ask questions that make you use definitions rather than have you recite them. I will probably ask one of the questions from the book at the end of the chapters.

The review session for this test will at a time and date (probably be Friday, 4/29) to be determined.

Chapter 7: Start with page 303. Understand breakeven analysis including the graph of straight-line TC and straight-line TR. How does the operating leverage affect the diagram? What is DOL? How do we calculate it? What does high DOL imply about the firm's profitability? Why is it acceptable to use the SRTC curve that is straight? Ignore pages 313 - 316.

Chapter 8: What are the characteristics of perfect competition, monopoly, monopolistic competition, and oligopoly? **Why do all of these firms set MR = MC?** What is meant by imperfect competition? Be able to relate the industry supply and demand for a perfectly competitive industry to the demand for the firm. Why does D = MR for that firm? Be able to find the output, price, total costs, total revenue, total profits or losses, and total variable costs from the ATC/AVC/MC/D/MR diagram. Hint: Find the ATC at the quantity produced **not** at the minimum of ATC. Be able show on both the firm and industry diagrams what happens if the profits are not zero. Even though we imply the industry supply curve is horizontal in the long-run, it can be upward sloping or downward. **Remember, all profit maximizing firms set MR = MC.** Be able to find exports or imports on the industry supply and demand diagram. Ignore the diagram for the exchange rate; and how to determine if the currency is getter stronger (appreciation) or weaker (depreciation) and how that affects the industry supply and demand diagram. Be able to find exports or imports on the industry supply and demand diagram. Be able to find a monopoly's output, price, total costs, total revenue, total profits or losses (which should not exist), and total variable costs from the ATC/AVC/MC/D/MR diagram. Do not worry about drawing both long-run and short-run graph at the same time; (however, in that case a monopoly in the long-run equilibrium will produce where SRMC = MR = LRMC and the SRATC will be tangent to the LRATC at that quantity.) Be able to show dead-weight loss on the diagram. Be able to draw the ATC/AVC/MC/D/MR diagram for a monopolistically competitive firm in the long-run and in the short-run. Know how it goes from the short-run to the long run for both short-run losses and short-run profits.

Chapter 9: What is meant by pure oligopoly (mostly what we will study) and a differentiated oligopoly? What is non-price competition? Be able to calculate the concentration ratios. Hint: Make sure the numbers are percent of industry sales, not volume of sales. If it is the latter, convert it to a percentage by dividing by the industry output. Be able to calculate the Herfindahl-Hirschman Index. Understand what range the index can take. Know that the DOJ generally does allow mergers if the post-merger HHI is <1000, or if the post-merger HHI is between 1000 and 1800 and the change in the HHI is <100, or if the post-merger HHI is >1800 and the change is <50. Why are CR4, etc., and HHI hard to calculate? Be able to derive the firms' *best response functions*, BRFs, for the Cournot-Nash model with constant marginal costs. The book does not do that but the appendix should help, so I hope your notes are good. (Find the residual demand for Firm 1 as a function of the Firm 2's output. Then find the MR for that demand curve. Set that equal to MC to find the Q_1. This will give Firm 1's output as a function of the Firm 2's output.) Use that to derive the firms' outputs and prices. Why is the kinked demand curve kinked? How do we get the MR and output for the firm? What is a cartel? Why does it usually fall apart? What is price leadership, a.k.a., a monopoly with a competitive fringe? Be able to find the equilibrium price and outputs for the firms. Why isn't the revenue maximizing-output the same as profit maximizing-output? Ignore sections 9.5 and on.

This is the non-graded assignment #9A that will be covered with assignment #9.

1) (30 points) Draw the industry and firm diagrams for a cartel that shows how the cartel chooses its output and why the cartel is likely to fall apart. Explain how your diagrams show what I asked for.

2) (30 points) Draw the industry demand and firm demand for a dominant firm with a competitive fringe of a limited number of competitors. Find the firm's output, the fringe output, industry output, and the industry price. Explain how you got each of them.

3) (10 points) Why isn't profit maximizing the same as revenue maximizing?

4) (30 points) Suppose the industry demand curve is given by $P = 100 - 2Q_I$ and the firms' marginal cost curve is given by $MC_i = 4$. Draw the D/MC diagram to find the Cournot firms' best response functions. Plot them. Use that to find the equilibrium levels of output for the two firms and the industry price..

Review Sheet for the Final:
The review session will be at a time to be determined. The final will be Wednesday, 4/12 at 3:00.

Chapter 10: What is game theory, strategies, payoffs, payoff matrix, players, and Nash Equilibrium? Why did I append "-Nash" to the Cournot model? Know how to find a dominant strategy, if it exists. Be able to find the cooperative equilibrium and the secure strategies. (The latter is the best of the worst case scenarios.) What is the prisoners' dilemma and why does it result in a Nash equilibrium that is not the cooperative equilibrium? How can we apply the Nash model to non-price competition? Do not worry sections 10.5 - 10.7. For 10.8, be able to find the equilibrium for a sequential decision tree.

When I write the final, I look for the most important topics and I ask questions about them. Then I look for questions which I wanted to ask about, but was unable to ask about. Those are put on the final.

This non-graded assignment is from the material after Exam #4.

1) (10 points) Suppose that a payoff matrix has five rows and three columns. What is the most number of Nash equilibria? Prove your point.

2) (25 points) Write a payoff matrix that has no Nash equilibrium. Prove it has no Nash equilibrium.

3) (35 points) Suppose that there is a sequential game in which you and your roommate have to decide on who is going to clean the room. Your roommate gets home and leaves before you get home. Your parents are coming to visit. Your roommate gets 10 utils if you clean it, 1 util if they clean it, and no utils if it stays messy. You get 100 utils if your roommate cleans it, 20 utils if you clean it, and no utils if it stays messy. Set up the decision tree the two of you face. Explain how you chose who is Player A and who is Player B and how you found the payoffs. Find the equilibrium. Explain how you found it.

5) (30 points) Use the payoff matrix on the table below to find the following, if they exist: each players' dominant strategy, each players' secure strategy, the Nash equilibrium, and the cooperative equilibrium. Briefly explain how you got each one and show all work. You may write on the matrix itself.

		Mustard Plug	
		High Price	Low Price
MU330	High Price	900 1250	920 980
	Medium Price	740 1280	750 600

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