Final exam

Instructions: You have 120 minutes to complete this exam. Write your answers on the sheets of paper provided to you. Credit, including partial credit, will depend principally on your explanations, so be sure to write thorough answers. Unsupported answers will receive 0 credit. Good luck!

Problem 1 (15 points) Chalky's Bookcases is a monopoly supplier of a much-desired type of bookcase; currently, they produce 4 bookcases/month and sell all of them at a price of $1,000 each. The total cost of producing 4 bookcases is $600.

Chalky's is considering increasing its production to 5 bookcases/month. The marginal cost of the 5th bookcase would be $200. Chalky's cannot price discriminate, and selling a 5th bookcase will require lowering the price to p. What must be true of p for this increase in production to be profitable?

Problem 2 (15 points) Little Airlines' Lexington-Mumbai route is flown by both tourists and business travelers. Tourists ($\frac{1}{2}$ of all travelers) have demand $p = 30 - q$ for quality level q, while business travelers ($\frac{1}{2}$ of all travelers) have demand $p = 60 - q$. For the sake of simplicity, assume that it does not cost the airline anything to change the quality levels in its plane, and that capacity is not a concern; the plane used on this route is big enough to hold all travellers.

a. Currently, Little Airlines has 2 sections on its plane: coach, with quality 30, and business class, with quality 60. What prices should it set for a coach ticket and a business class ticket so that tourists buy coach tickets and business travelers buy business class tickets?

b. Demonstrate that the quality levels identified in part a. are not profit-maximizing for Little Airlines.

c. Suppose the fraction of travelers flying this route on business were to increase. What effect, if any, would this have on the optimal price of a coach ticket? Explain.

Problem 3 (15 points) Suppose that normal workers increase a firm's revenue by $6, while smart workers increase revenue by A, where $A > 6$. Firms cannot tell smart workers from normal workers *ex ante*, but can observe a worker's educational level.

Any worker can acquire as much education as she wishes, but getting e years costs a normal worker $B * e$, where $B > 1$, while e years cost a smart worker only e.

a. Solve for e^*, the minimum years of education that smart workers must get to differentiate themselves from normal workers. Your answer will be a function of the variables A and B.

b. As A increases, does e^* increase or decrease? Explain intuitively why this is the case.

c. As B increases, does e^* increase or decrease? Explain intuitively why this is the case.

Problem 4 (15 points) Consider the game below:

		Man	
		Threaten	Don't threaten
Thief	Steal	30,30	50,35
	Don't steal	40,60	20,20

a. What is the Nash equilibrium if choices are made simultaneously?

b. What is the equilibrium outcome if player 1 chooses first?

c. What is the equilibrium outcome if player 2 chooses first?

Problem 5 (10 points) A 2009 study by the White Group found that new cars lose, on average, 30% of their resale value in the first year after purchase, but only an additional 5% in their second year after purchase. Explain why this is, using concepts discussed in class.

Problem 6 (15 points) Two bills are being considered in Congress (bill A, which would reinstitute the Volstead Act, and bill B, which would prohibit citizens of Canadian origin from owning property). Here are the payoffs to Congress and the president depending upon which laws are passed:

Outcome	Congress	President
Bill A only	4	1
Bill B only	1	4
Both bills	3	3
Neither bill	2	2

a. Suppose that Congress first decides which of the four options to select. The president can then either sign or *veto*, in which case no law is passed. Which bills become laws in the equilibrium of this sequential game? Explain, with aid of a diagram.

b. Now suppose that the president has a *line-item veto*, so that if Congress passes both bills, he can choose to sign bill A or bill B only. However, he cannot enact laws that Congress does not pass. Which bills become laws in the equilibrium of this game? Explain.

Problem 7 (15 points) Answer the following two questions about auctions:

a. You are bidding in two separate auctions for two paintings you value equally. One auction is an decreasing price, open auction. The second is a sealed-bid, second price auction. In which auction should you bid more, and why?

a. Your company is bidding for two government contracts. It is not possible to know exactly how profitable each contract will be (i.e. how much work is required) until after each is fulfilled, though your initial estimate is that they will be equally profitable. The first contract has 50 other bidders, whereas the second contract has only 1 other bidder. Both contracts are awarded via second-price, sealed bid auctions. On which contract should you bid more, and why?