1	2	3	4	5	6	7	8	Total

Economics 142 Final Exam **NAME________________________________**
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Your grade from this exam is two thirds of your course grade. There are eight questions, weighted equally. The exam ends promptly at 2:30, so you have three hours. You may not use books or notes. (Calculators are allowed, but shouldn't be needed.) Write your name in the space above, now. Write your answers below the questions, on the back of the page, or if you prefer on separate sheets. Explain your arguments and show your work. Good luck!

1. *(this question is the same as question 2 on the midterm exam)* This problem concerns a Kahneman-Knetsch-Thaler-style experiment in which mugs are randomly distributed to half of the subjects ("owners") in an experiment and they are then allowed to trade them with other subjects ("non-owners") for money if they wish. Imagine that each subject has linear consumption utility for mugs: $v_{\text{mug}} + m$, where m is the amount of money s/he has left after any mug purchase or sale. (To a person with mug consumption value v_{mug}, having a mug is worth the same as having another \$$v$ would be, and not having a mug is worth \$0.) Each subject also has gain-loss utility over deviations from mug and/or money consumption from a reference point determined by her/his expectations. The coefficient of loss aversion is 2, so that losses (in mugs and/or money) relative to the reference point lower utility twice as much as gains raise utility. The weight of gain-loss utility is η, so that total utility equals consumption utility + η × gain-loss utility.

(a) First consider, as we did in class, an owner with mug consumption value \$$v$ who expects to keep her/his mug (and gain no money), so that her/his reference point is having the mug and \$0). What is the lowest price m (in dollars) at which s/he would be willing to sell his mug, as a function of v and η? Carefully explain your argument.

(b) Now consider an owner with mug consumption value \$$v$ who expects to sell her/his mug for \$2v, so that her/his reference point is having no mug and \$2v. For what values of v and η will the owner be willing to sell her/his mug for \$2v? Explain carefully.

2. *(this question is like problem 30 on problem set 1, with the important difference that the numbers here are 1.5 and $15 million, not 2.5 and $25 million as in problem 30)* Suppose that you are making a take-it-or-leave-it offer for the UCSD Economics Department to Joel Watson, its brilliant but compassionate CEO. Watson knows the Department's true value, and you know this; but you don't know the Department's true value, and Watson knows that you don't know it. From your point of view, the value of the Department to Watson is distributed uniformly, equally likely to take each value from $0 to $10 million. However, you also know that whatever the Department is worth to Watson, it is worth exactly 1.5 times that to you, e.g. if it is worth $5 million to Watson, it is worth $7.5 million to you. Assume that you are risk-neutral, that your offer is the last chance for a deal, and that Watson is rational, so that he will accept your offer if and only if it is above his value. (Don't worry about ties, which have zero probability.)

(a) What is your optimal take-it-or-leave-it offer? Explain.

(b) Predict what offer a naïve person might make in this situation. Explain by describing how such a person is likely to think about it, and what errors, if any, they are likely to make.

3. Suppose there are only two types of mutual fund managers: Skilled and Average. Skilled managers outperform the stock market index in 80% of all years, while Average managers outperform the stock market index in 40% of all years. (You can assume managers' performance is independent across years.) 99% of mutual fund managers are Average, and only 1% are Skilled.

(a) Suppose a fund that started up two years ago has outperformed the stock market index for both years. Show that the probability that its manager is Skilled is less than 1/25.

Now consider an investor who suffers from base-rate neglect, in that he ignores the overall frequencies of Skilled and Unskilled managers and focuses on their performance records, as if 50%, rather than 1%, of mutual fund managers were Skilled.

(b) Show that this investor will conclude that there is a 4/5 chance that the manager is Skilled.

(c) How is this mistaken conclusion an example of representativeness?

4. *(Fibonacci Fine Arts Cinema, due to Matthew Rabin)* Consider a consumer who can watch a total of 3 movies over the next 4 weeks, deciding which movie to skip. In the week in which he skips the movie, he gets 0 utils. The utils for seeing the movies are as follows:

week 1: mediocre movie = 3 utils
week 2: good movie = 5 utils
week 3: great movie = 8 utils
week 4: Johnny Depp movie (!) = 13 utils

The consumer has present-biased preferences with $\beta = ½$, but does not otherwise discount the future (so $\delta = 1$, in the notation used in class and the notes). Thus, from the point of view of the current week, utils in any period beyond the current week are valued half as much as current-week utils. E.g., from the point of view of week 1, a stream of 4 utils in week 1, 2 in week 2, 3 in week 3, and 5 in week 4 has total value $4 + ½(2 + 3 + 5) = 9$. From the point of view of week 2, the rest of the same stream (omitting the 4 from week 1) has total value $2 + ½(3 + 5) = 6$.

(a) From the point of view of week 1, what is the consumer's ideal plan, assuming that he could follow it? Explain by comparing the alternatives and what values they would yield.

(b) Now suppose that the consumer is naïve, in that when deciding what to do each week, he assumes that in future weeks he will follow the rest of that week's plan. What will such a consumer actually do? (Hint: Start with week 4 and work backwards. In week 4 he can (and will want to) see the Johnny Depp movie if and only if he has skipped a movie in weeks 1, 2, or 3. In week 3, if he has not already skipped a movie (in which case he can (and will want to) see both week 3's and week 4's movies), his only choice is whether to skip week 3 or week 4.)

(c) Now suppose that the consumer is sophisticated, in that he can predict his own future choices, taking his anticipated present bias into account. What will such a consumer actually do?

5. *(this question is the same as problem 6 on problem set 2)* Consider the two-person game, in which both players know the value of x:

		Column L	R
Row	**U**	**1, 2**	**0, 1**
	D	**3, 0**	**x, 1**

(a) For what values of x (if any) is there a Nash equilibrium in which Column chooses R (with probability 1)? Explain, and describe the equilibrium or equilibria.

(b) For what values of x (if any) does strategy R for Column survive iterated deletion of strictly dominated strategies? Explain.

6. *(this question is the same as parts of problems 1 and 23 or 27 on problem set 2)* In the game Pigs in a Box discussed in class:

	Push	**Wait**
Push	1 5	5 3
Wait	-1 9	0 0

(a) Find each pig's strictly dominated strategy or strategies, if any, and each pig's strategies that survive iterated deletion of strictly dominated strategies.

(b) Find the Nash equilibrium or equilibria.

(c) Justify your Nash equilibrium as the only possible outcome of the pigs' strategic thinking, making whatever assumptions about the pigs' rationality and/or knowledge of each other's rationality you need.

Now assume that players are repeatedly paired at random from a large population to play this game, and that they adjust their strategies over time in a way that increases the population frequency of a pure strategy that has higher expected payoff, given the current mix of strategies in the population.

(d) Show, graphically or algebraically or intuitively, that the population will converge to a state in which Column players all play Wait.

(e) Show, graphically or algebraically or intuitively, that the population will eventually converge to a state in which Row players all play Push.

7. *(this question is the same as problem 9 on problem set 2)* In the Alphonse and Gaston game:

	Go	**Wait**
Go	**0** **0**	**1** **1**
Wait	**1** **1**	**0** **0**

(a) Find the mixed-strategy Nash equilibrium and explain why it is an equilibrium.

(b) Compute players' equilibrium expected payoffs in the mixed-strategy equilibrium.

(c) If the players cannot communicate or change the game, would you expect them to be able to coordinate on one of the more efficient pure-strategy equilibria? Why or why not?

8. *(this question is the same as parts of problems 10 and 19 on problem set 2)* In the Battle of the Sexes game:

		Column (Woman)	
		Fights	**Ballet**
Row (Man)	**Fights**	1 3	0 0
	Ballet	0 0	3 1

(a) Find the mixed-strategy Nash equilibrium and explain why it is an equilibrium.

(b) Compute players' equilibrium expected payoffs. Which would a player prefer, if he could choose: playing the mixed-strategy equilibrium or playing his least favorite pure-strategy equilibrium?

(c) Find the subgame-perfect equilibrium in the game in which Column can choose her strategy first and Row can observe it before choosing his strategy. Would you expect the players to be able to coordinate on one of the (more efficient) pure-strategy equilibria in this game? Why or why not?

(d) What would you expect to happen if Column chooses her strategy first and Row does NOT get to observe her choice before choosing his strategy?