# Homework Set 4

1. (10%) You submit a new book to a publisher. The publisher agrees to publish the book and offers you two payment alternatives: (1) you will receive a fixed fee of $180,000 independent of how well the book does or (2) you will receive $400,000 if the book sells 10,000 or more copies and nothing if fewer than 10,000 copies are sold in its first three years on the market. If the probability of selling 10,000 copies or more is 0.5, and you accept the second alternative, does this demonstrate that you are a risk taker? Explain.

2. (5%) Sally is currently making $400 a week for a 40 hour a week selling shoes. Her manager offers to place her on commission, paying her 10% of her sales. If she accepts, she will be allowed to set her own hours. Sally knows that, on average, she sells $100 of shoes per hour on average. Some hours she sells more; some she sells less; in fact there is considerable variability in this number. However there is no discernable pattern. Though Sally's friends have assumed that the must make a lot of money during "busy" weeks and a lot less other weeks, Sally has found no such pattern. Assuming that Sally is a risk-averter, should she take up her manager on the offer? Explain why or why not.

3. (10%) Last week, Arthur Hart appeared on Who Wants to be a Millionaire. As time ran out, he successfully answered the $500,000 question. If he appears next week, he will be asked a question worth $1,000,000. If he answers it correctly, he will get $1,000,000; if he answers it incorrectly, he will get the $32,000 consolation prize. Art must make an irrevocable decision of whether to take his $500,000 winnings or reappear. If he reappears, he firmly believes that he has a 1/3 chance of answering correctly. For peculiar reasons, he does not have the option of quitting if, after he is asked the question, he thinks it too hard: he would walk way with either $32,000 or $1,000,000. (I know I have stated some rules of the show incorrectly and probably stated some other rules incorrectly as well. Answer the question according to my rules.)

   Of course, Art has calculated his utility from different levels of income as follows:

Income	Utility
32,000	8,000

500,000	22,000
1,000,000	28,000

- Should Art fish or cut bait? Should he come back or take his winnings? Show your work?

- The producers of the show want to make it interesting. They can affect the probability of Art's winning by altering the difficulty of the question. What probability would leave Art indifferent between appearing and not appearing?

4. (10%). The graph below shows a Beth's utility function (utility as a function of income.)   Beth currently has income of $100,000 a year. She is offered a new job with uncertain pay. There is a 75% chance that she will earn $200,000 a year, but a 25% chance that she will earn $50,000. Her current employer, knowing of her offer, is thinking of offering her a raise to stay. Indicate graphically the value of the minimum raise she must get to make her willing to stay. And remember, we like well labeled- and well explained graphs.

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Income

40   100   200
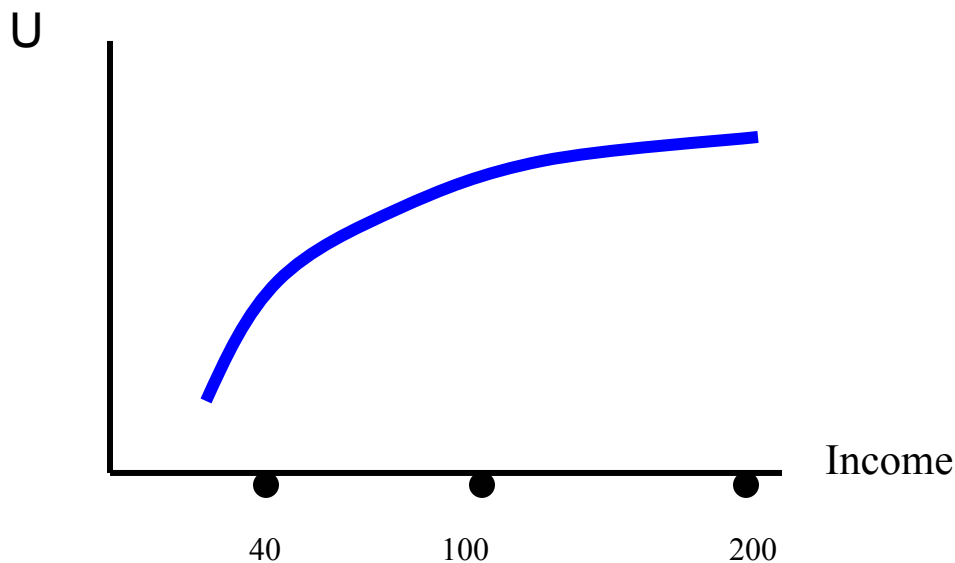
5. (10%) Find as many production isoquants as you can. That is, find as many points that lie on a particular production isoquant

- Does this production function have diminishing returns to proportion? Illustrate your answer with at least two examples.

- Compute the average product of labor when there are two thumpleblowers and 3 workers; compute the marginal product of a fourth worker

6. (5%) A consumer spends about 10% of her income on a product, research has established that for each 1 percent increase in her income, her purchases of the product rise about 1.3 percent. Her Marshallian price elasticity of demand is -0.75. What is her Hicksian price elasticity of demand?

7. (25%) Bugs Bunny consumes only carrots and lettuce, both of which are normal goods for Bugs. One day the price of carrots goes up.
   - Illustrate Bugs old and new optimum points and show both the substitution and income effects. How does your graph reflect that fact?
   - Can you say for certain whether the substitution effect causes Bugs to buy more or less lettuce than before? If you can, use your graph to explain why. If not, explain on what the answer would depend. Note: although the price of carrots has risen, you are being asked for the impact on lettuce.
   - Can you say for certain whether the income effect causes Bugs to buy more or less lettuce than before? If you can, use your graph to explain why. If not, explain on what the answer would depend.
   - When the price of carrots goes down, can you say for certain whether Bugs would by more or less lettuce than before? If you can, carefully justify your answer; if you cannot, explain on what the answer would depend.
   - Suppose that almost all of Bug's income is spend on lettuce. Now when the price of carrots goes up, do you expect him to buy more or less lettuce than before? Carefully justify your answer in terms of the income and substitution effects.

8. (5%)You decide to buy a block of tickets to all KSU home games including the homecoming game. The price is $6 per ticket. The day before the homecoming game, you learn that the game is sold out and that you can sell your ticket for $50? If you go to the homecoming game, what is the cost of attending? Would you predict that the percentage of students with season tickets who attend the homecoming game is higher or lower to other games, all other tings equal?

9. (10%) If the price of factor A is $20 per unit and the price of factor B is $300 per unit, and the marginal product of factor A is 40 units and the marginal product of factor B is 60 units, the firm should increase the employment of A and decrease the employment of B to minimize the total long-run cost of producing existing output. Explain why you agree or disagree with this statement.

10. (5%) the estimated production function of a firm is

$$Q=AK^{0.24}L^{0.70}$$

If the firm expands output by 5%, will its long-run cost increase by more than, equal to, or less than 5%? Explain

11. (5%) A firm cannot change a fixed factor in the short run. Therefore its total cost in the short run must exceed its total cost in the long run when it can vary all of its factors of production. Explain why you agree or disagree with this statement.