

Slide your assignment under my office door by the time class is scheduled to end, i.e. 4:20.

Place your name on the back of this sheet of paper and nowhere else. Staple your answers face up on the front of this sheet of paper. Failure to follow these directions will cost you 10 points. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

Show all work for all questions.

1) (20 points) Suppose your utility function for art and beer is given by $U(A,B) = 4A^{1/2}B^{1/4}$. If the price of art is \$5/A and the price of beer is \$10/B, and your disposable income is \$480, then what level of consumption of each would maximize your utility? How much is your utility? How much is your marginal utility of money?

2) (25 points) Suppose you have decided that you want to work as little as possible subject to the constraint that your utility is 64 utils. Suppose your utility function for cherries and doughnuts is given by $U(C,D) = 4C^{1/2}D^{1/4}$. If the price of cherries is \$5/C and the price of doughnuts is \$10/D, then what is the minimal income you need to earn? What does λ mean in this case? Explain your logic.

3) (30 points) Suppose your utility function for eggs, furniture, and geese is given by $U(E, F, G) = 30E^{1/3}F^{1/3}G^{1/6}$. If the price of eggs is \$2/E, the price of furniture is \$2/F, the price of geese is \$1/G, and your income is \$320, then how much of each would you consume if you were maximizing your utility? What is the marginal utility of money?

4) (25 points) Suppose you are manufacturing coats and your production function is given by $Q(K, L) = 8K^{1/2}L^{1/2}$. If capital costs \$5/K and labor costs \$20/L, and you want to produce 160 coats, how much capital and labor should you use? What does λ mean in this case? Explain your logic.