

Do not write your name on the assignment. Write your name only on the back of this sheet of paper and staple your answers on the front of this sheet of paper. Your assignment will be typed, except graphs can be drawn by hand and mathematical equations can be done by hand. Failure to follow these directions will cost you 1 point on the assignment.

1) (25 points) Suppose that your utility from pizza (P) and sandwiches (S) is given by $U(P,S) = \sqrt{PS}$. If the price of a small pizza is \$8/pizza, a sandwich costs \$2/sandwich, and you have \$32 to spend this week, then how many of each will you consume? How much utility will you have? Find λ to estimate the additional utility from \$1 more of income. Rework the mathematics to find out exactly how much your utility will increase if your income increases to \$33. Show all work.

2) (15 points) Suppose the utility you get from bananas (B) and peaches (C) is given by $U(B,P) = \ln(B) + \ln(P)$. If bananas cost \$0.50/lb and peaches cost \$0.30/lb, how much would you buy if you had \$30 to spend? Show all work.

3) (25 points) Suppose the utility you get from cards (C), dice (D) and photographs (P) is given by $U(C, D, P) = X^{1/4}Y^{1/2}Z^{1/4}$. You have \$80 to spend. If cards cost \$1, dice cost \$1, and photographs cost \$20, then how many of each will you buy? Show all work.

4) (10 points) A utility function must have decreasing marginal utility. How can you tell if the functions have that property? Show that the functions in questions #1 and #2 have decreasing marginal utility for P.