

The last one!

Place your name on the back of this sheet of paper and nowhere else. Staple your answers on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

Show all calculations and all work on all questions.

- 1) (20 points) Find U'_F , U'_C , U''_{FF} , U''_{FC} , U''_{CC} , U''_{CF} for the utility function $U(F, C) = 12F^{1/2}C^{1/3}$ where F is food and C is clothing. Does this utility function exhibit positive marginal utility and decreasing marginal utility for both products? Explain your logic.
- 2) (20 points) Suppose your consumption of pants and shirts with respect to your income are given by $P = I/4$ and $S = I/16$. If your utility function is given by $U(P, S) = 40P^{1/4}S^{1/2}$. Find your marginal utility of pants, marginal utility of shirts and marginal utility of income when you have \$1024 of income.
- 3) (20 points) Find U'_F , U'_C , U''_{FF} , U''_{FC} , U''_{CC} , U''_{CF} for the utility function $U(F, C) = 5\ln(C \cdot F)$ where F is food and C is clothing. Does this utility function exhibit positive marginal utility and decreasing marginal utility for both products? Explain your logic.
- 4) (20 points) Find all first partial derivatives, all second partial derivatives, and all third partial derivatives of $Q(I, P) = I/P$.
- 5) (20 points) Find all first partial derivatives, all second partial derivatives, and all third partial derivatives of $Q(I, P) = 2I - 8P^{3/2}$.