Microeconomics for Public Policy I
Fall 2020

In Class Problems, Lecture 4

1. Complements and substitutes
For each of the following utility functions, explain whether X and Y are perfect complements, perfect substitutes, or some of both – and why.

(a). $U = U(X, Y) = XY$

(b). $U = U(X, Y) = X + Y$

(c). $U = U(X, Y) = X^{0.7} Y^{0.3}$

2. Utility maximization

Sarah gets utility from soda (S) and hotdogs (H). Her utility function is $U = S^{0.5} H^{0.5}$, $MU_S = 0.5 \frac{H^{0.5}}{S^{0.5}}$, and $MU_H = 0.5 \frac{S^{0.5}}{H^{0.5}}$. Sarah's income is \$12, and the prices of soda and hotdogs are \$2 and \$3, respectively.

(a). Write the equation for Sarah's budget constraint

(b). Draw Sarah's budget constraint

(c). Write the marginal rate of substitution in terms of H and S

(d). What amount of sodas and hotdogs makes Sarah happiest, given her budget constraint? (Recall that you have two equations and two unknowns.)

3. GLS Chapter 4, Question 8 (Second edition, question 9)

4. GLS Chapter 4, Question 12. Omit part (b)

5. GLS Chapter 4, Question 16 (Second edition: question 14)