

ECON 201, Prof. Hogendorn: Hour Exam #1

You have 1 hour to complete the exam. Have a good break!

1. Suppose that a budget equation is given by $p_1x_1 + p_2x_2 = m$. The government decides to give a lump sum subsidy of \$600, a quantity tax on good 1 of t , and a quantity subsidy on good 2 of \$20. What is the formula for the new budget line? (5 points)
2. Suppose that the demand curve is given by $x = 10 - p$. If the price changes from 6 to 3, what is the change in consumer's surplus? (5 points).
3. Suppose that a typical driver's utility for car repairs, R , and other goods, X , can be given by

$$u(R, X) = \frac{RX}{R + X}$$

- (a) Use the Lagrangian to solve for the utility maximizing number of car repairs. Let the amount of money available be M and let the price of repairs be p_R . The price of other goods is \$1. Show that the demand for car repairs is

$$R(p_R, M) = \frac{M}{p_R + \sqrt{p_R}}$$

(5 points for setup, 5 points for verifying demand function)

- (b) One possible pricing plan for a garage is to charge \$64 per repair. If $M = \$1000$, what would be the driver's utility under this plan? How many repairs would be purchased? How much would the total spending on car repairs be? (5 points)
 - (c) Alternatively, the garage could offer an insurance plan. Suppose the insurance were \$850. Repairs could then be purchased for \$4. What would be the driver's utility under this plan? How many repairs would be purchased? How much would the total spending on repairs plus insurance be? (5 points)
4. A family in Iowa consumes corn, C , and ham, H . They have a weekly food budget of \$100. If corn costs $p_C = \$1$ per pound and ham costs $p_H = \$3$ per pound, they choose to consume 55 pounds of corn and 15 pounds of ham each week. The family's utility function is

$$u(C, H) = C^a H^{1-a}$$

- (a) What is a ? (Use the MRS to show your work.) (5 points)
- (b) Write the demand functions for corn and ham. Suppose the price of ham falls to \$2 per pound. What are the new amounts of corn and ham consumed? (5 points)
- (c) Write the Slutsky compensated demand function. What is the Slutsky substitution effect on the amount of ham consumed as a result of the price change? (5 points)