

Questions from prior midterms, part 2.

Short answer problems

- Lisa works and uses the income she makes to purchase chocolates. As her wage goes up, she works more. TRUE, FALSE, or UNCERTAIN: Leisure time is an inferior good for Lisa.
- John only consumes two goods, beer and wine. Beer is an inferior good for John. *If the price of wine rises, John will purchase less wine.*
- Suppose there are two consumers of coffee in the entire market: Cindy and Monika. Their inverse demand curves are given by:

$$P = 20 - 2Q_C$$

$$P = 20 - Q_M$$

Find the function describing market demand for coffee. What is the price elasticity of demand?

- Richard is a ski instructor and gives hour long ski lessons. As the amount the resort compensates him per lesson increases, Richard wants to give more lessons.

Long answer question (30 points) Suppose that two goods are purchased by a consumer, cd players and speakers. These goods are perfect complements, and two speakers are consumed for every cd player. Prices are given by P_c and P_s , and income is given by m .

- What is the inequality describing the budget constraint faced by the consumer? Graph the budget constraint, labeling the axes and the slope of the budget line.
- Solve the consumer's optimization problem, finding the demand functions $X_c(P_c, P_s, m)$ and $X_s(P_c, P_s, m)$. Graphically represent the indifference curve and budget line corresponding to the optimal bundle.
- Suppose income is given by $m=300$. The price of a cd player is initially 50 while the price of a speaker is 25. What is the optimal bundle based on what you found in part b? Suppose the price of CD players went up to 100. What would be the new optimal bundle? Show graphically the old and new budget lines, and the indifference curves corresponding to the optimal bundle under the original and new prices.
- Next show graphically substitution effect of the price increase. How big will the substitution effect be? (no need to solve for anything explicitly) Provide some intuition for what you found for the substitution effect.

Long answer question (15 points) Suppose the production function for a firm in an industry is given by $y = x_1^{3/4} x_2^{1/4}$.

- Does this production function exhibit constant, decreasing, or increasing returns to scale?

- b. Suppose the factor prices are given by $w_1 = 15$ and $w_2 = 5$. What are the conditional factor demand functions for inputs 1 and 2?
- c. Use the factor demand curves to find the firm's total cost function.

Longer answer question Jeffrey Lebowski only likes two goods: milk and pretzels. His preferences are represented by the utility function $U = x_1^{1/2} x_2^{1/2}$ where x_1 =pretzels and x_2 =bottles of milk. (These are Cobb-Douglas preferences).

- a) What are Lebowski's demand functions for pretzels and milk?
- b) Now suppose that $p_1=2$ and $p_2=2$ and Lebowski's income is 28. What amount of pretzels and milk does Lebowski consume? Graph the budget line, approximately what the indifference curve looks like, and the optimal bundle. LABEL EVERYTHING.
- c) Imagine now the price of a bottle of milk goes down to \$1. Graph Lebowski's old and new optimal bundles. LABEL EVERYTHING.
- d) Solve for the substitution and income effects, and indicate them on a graph.