

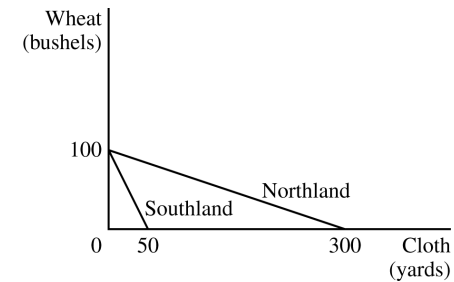
3. The table provided shows the marginal utility for Lucy when she consumes Good X and Good Y.

Quantity of Good X	Marginal Utility of Good X (utils)	Quantity of Good Y	Marginal Utility of Good Y (utils)
1	20	1	28
2	16	2	24
3	12	3	16
4	8	4	8
5	4	5	-4
6	-2	6	-8

- A. If Good X and Good Y are free, how many units of each good will maximize Lucy's total utility?
- B. Calculate Lucy's total utility if she consumes 2 units of Good X and 2 units of Good Y. Show your work.
- C. Suppose instead that the price of each unit of Good X is \$2 and the price of each unit of Good Y is \$4. Lucy has a budget of \$20 to spend on the two goods.
- If Lucy purchases 2 units of Good X, what is the maximum quantity of Good Y Lucy can purchase?
 - What is Lucy's optimal combination of Good X and Good Y? Explain your answer using marginal analysis and numbers.
- D. Suppose the price elasticity of demand for Good X is -2.0 , the price elasticity of demand for Good Y is -0.8 , and the cross-price elasticity of demand between Good X and Good Y is $+1.6$. Are goods X and Y complementary goods, substitute goods, normal goods, or inferior goods? Explain.

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2. The graph shows the production possibilities curves for Northland and Southland.



- (a) Which country has a comparative advantage in producing wheat? Explain using numbers.
- (b) Identify a specific number of yards of cloth that could be traded for 10 bushels of wheat and would be mutually beneficial to Northland and Southland.
- (c) Southland's maximum possible output of wheat falls from 100 bushels to 75 bushels. Assuming no other changes, will Southland have a comparative advantage in producing cloth? Explain using numbers.
- (d) Turnips are produced in a perfectly competitive market in Alderia, a third country, which does not engage in international trade. Runoff from turnip fields pollutes Alderia's rivers, hurting its residents.
- Does the turnip market equilibrium result in an efficient allocation of resources? Explain using marginal analysis.
 - In an effort to reduce pollution, Alderia's government imposes a lump-sum tax on turnip production. What will be the impact on the turnip market equilibrium price and quantity in the short run?

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

3. The table below shows the total cost and total benefit of advertisements placed by AZY Foods, a firm in the retail food market.

Number of Advertisements	Total Cost (\$)	Total Benefit (\$)
1	300	1,200
2	500	2,200
3	800	3,000
4	1,300	3,600
5	2,100	4,000
6	3,000	4,200
7	4,100	4,200

- (a) Calculate the total net benefit of placing three advertisements. Show your work.
- (b) Calculate the marginal net benefit of the third advertisement. Show your work.
- (c) What is the optimal number of advertisements placed by AZY Foods? Explain using marginal analysis.
- (d) Suppose over the next year the marginal benefit that AZY Foods receives from each advertisement increases by \$300. Identify the optimal number of advertisements.
- (e) There are many firms in the retail food market. Each firm places its own firm-specific advertisements without considering the actions of its competitors. In what market structure is AZY Foods operating?

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