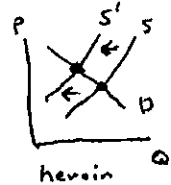


Questions 1-5: multiple choice, 6 points each, circle correct answer.

1. Heroin production in Afghanistan has increased dramatically in the past five years, leading to a sharp drop in heroin prices in western Europe. Given that current situation, which of the following policies would cause the price of heroin to rise and the quantity to fall?

- A a) Implementing a price support program for cotton, an alternative crop for Afghan farmers.
 b) Educating German schoolchildren about the dangers of heroin consumption.
 c) Reducing the penalties for smugglers caught carrying heroin across international borders.
 d) Shutting down the methadone program for heroin addicts in western Europe.



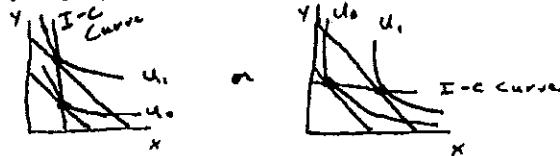
2. The market demand curve for cranberries is given by $Q_D = 500 - 4P$, and the market supply curve is given by the equation $Q_S = -100 + 2P$. Equilibrium in this market is characterized by

- B a) $P = \$50, Q = 200$
 b) $P = \$100, Q = 100$
 c) $P = \$150, Q = 75$
 d) $P = \$200, Q = 50$

$$\begin{aligned} Q_D &= Q_S \\ 500 - 4P &= -100 + 2P \\ 600 &= 6P \\ P &= 100, Q = 100 \end{aligned}$$

3. If the income-consumption curve is negatively sloped, then we can conclude that

- D a) X is a normal good.
 b) X and Y are substitutes.
 c) Demand for X is elastic.
 d) Either X or Y is an inferior good.



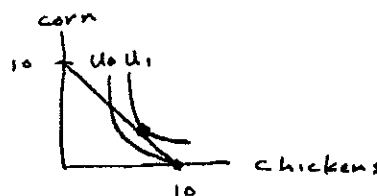
4. You get utility from the consumption of food and clothing according to the utility function $U = F^{1/2}C^{1/2}$. Suppose your consumption of food is held constant at $F = 16$. Marginal utility associated with an increase in the consumption of clothing from $C = 4$ to

- A a) 0.94
 b) 1.26
 c) 2.56
 d) 9.00

$$\begin{aligned} C = 4 \text{ is: } & u = (16)^{1/2} (4)^{1/2} = 8 \\ C = 5 \text{ is: } & u = (16)^{1/2} (5)^{1/2} = 8.94 \\ \text{MU} &= 0.94 \end{aligned}$$

5. Raoul works on a farm and is paid in chickens. He gets 10 chickens per week in wages. The only good produced in his country's economy is corn. His marginal rate of substitution at his initial bundle is 2 chickens for 1 bushel of corn. In the market place the going rate of barter is 1 chicken for 1 bushel of corn. Raoul should

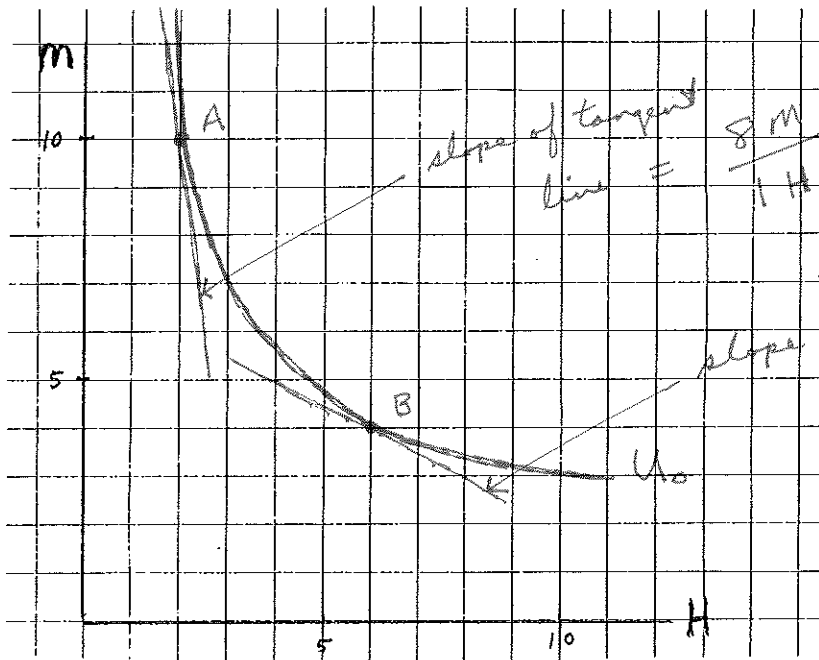
- B a) Stick with his initial bundle and not trade with others.
 b) Take his chickens to market and trade some chickens for some corn.
 c) Evaluate the marginal utilities of both chicken and corn to determine the best course of action.
 d) Emigrate to the U.S.



Questions 1-5: multiple choice, 6 points each, circle correct answer.

1. Heroin production in Afghanistan has increased dramatically in the past five years, leading to a sharp drop in heroin prices in western Europe. Given that current situation, which of the following policies would cause the price of heroin to rise and the quantity to fall?
- D
- a) Shutting down the methadone program for heroin addicts in western Europe.
 - b) Educating German schoolchildren about the dangers of heroin consumption.
 - c) Reducing the penalties for smugglers caught carrying heroin across international borders.
 - d) Implementing a price support program for cotton, an alternative crop for Afghan farmers.
2. The market demand curve for cranberries is given by $Q_D = 500 - 4P$, and the market supply curve is given by the equation $Q_S = -100 + 2P$. Equilibrium in this market is characterized by
- C
- a) $P = \$200, Q = 50$
 - b) $P = \$150, Q = 75$
 - c) $P = \$100, Q = 100$
 - d) $P = \$50, Q = 200$
3. If the income-consumption curve is negatively sloped, then we can conclude that
- B
- a) X is a normal good.
 - b) Either X or Y is an inferior good.
 - c) Demand for X is elastic.
 - d) X and Y are substitutes.
4. You get utility from the consumption of food and clothing according to the utility function $U = F^{1/2}C^{1/2}$. Suppose your consumption of food is held constant at $F = 16$. Marginal utility associated with an increase in the consumption of clothing from $C = 4$ to $C = 5$ is:
- A
- a) 0.94
 - b) 1.26
 - c) 2.56
 - d) 9.00
5. Raoul works on a farm and is paid in chickens. He gets 10 chickens per week in wages. The only good produced in his country's economy is corn. His marginal rate of substitution at his initial bundle is 2 chickens for 1 bushel of corn. In the market place the going rate of barter is 1 chicken for 1 bushel of corn. Raoul should
- B
- a) Stick with his initial bundle and not trade with others.
 - b) Take his chickens to market and trade some chickens for some corn.
 - c) Evaluate the marginal utilities of both chicken and corn to determine the best course of action.
 - d) Emigrate to the U.S.

6. (10 pts.) Fidel consumes hamburgers (H) and Milkshakes (M). At market basket A, containing 2 hamburgers and 10 milkshakes, his $MRS_{HM} = 8$. At market basket B, containing 6 hamburgers and 4 milkshakes, his $MRS_{HM} = \frac{1}{2}$. Both market baskets are on the same indifference curve. Draw this indifference curve, being careful that its curvature reflects the information provided.



Both bundle A and bundle B lie on indifference curve U_0

7. (10 pts.) You own and operate a video rental store. Currently you charge \$2 to rent a DVD for 24 hours, and on average rent 300 DVDs each day. Having experimented with price, you know that raising price by twenty-five cents causes rentals to fall by 50 per day, while lowering price leads to an increase of 50 rentals per day. Calculate own-price elasticity of demand. Show your work, including the formula that you use.

$$E_{X, P_X} = \frac{\% \Delta X}{\% \Delta P_X} = \frac{\frac{\Delta X}{X}}{\frac{\Delta P}{P}} = \frac{\Delta X}{\Delta P} \cdot \frac{P}{X}$$

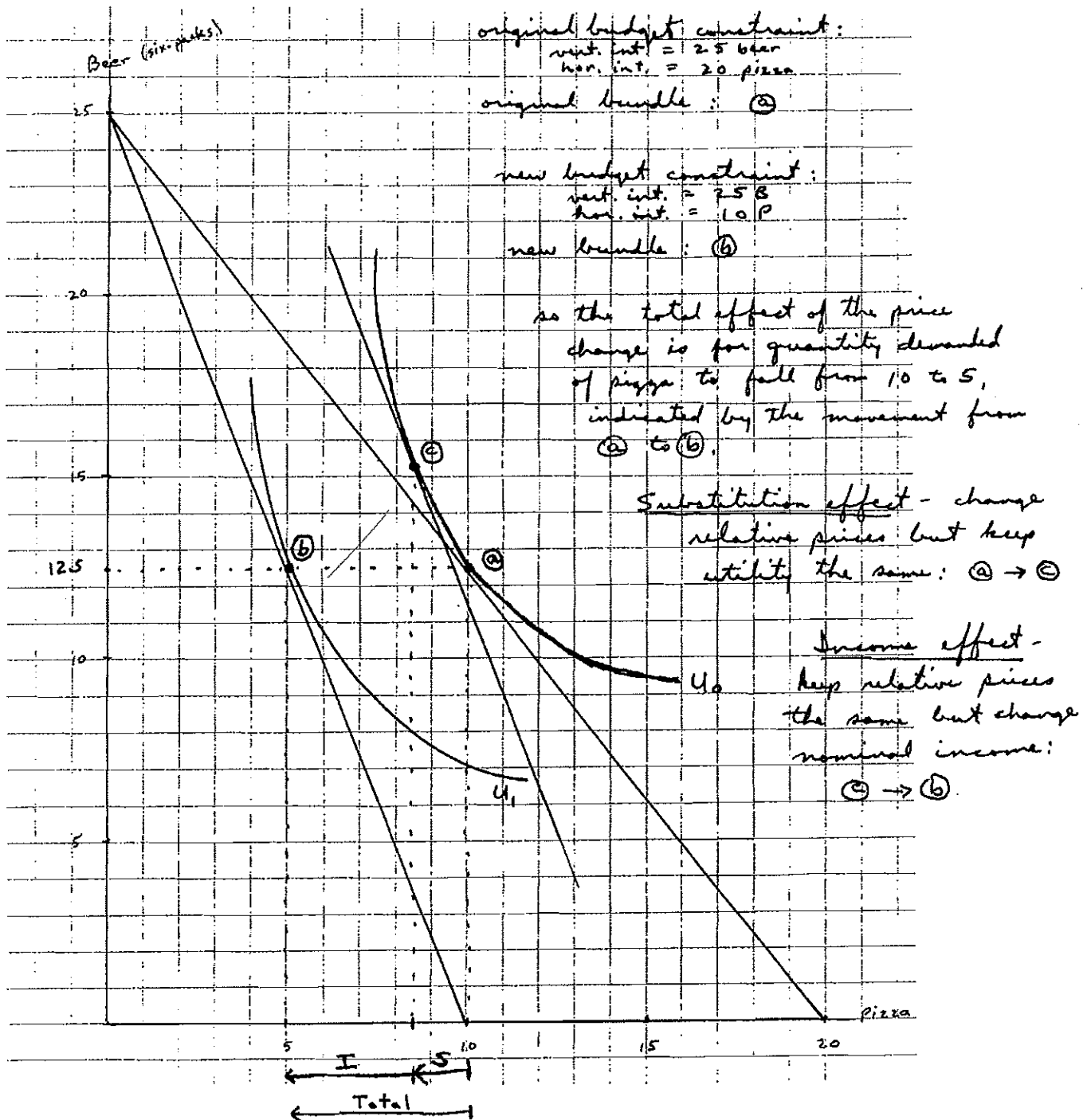
Tan version: $\frac{\Delta X}{\Delta P} = -\frac{50}{0.25}$, $X = 300$, $P_X = \$2.00$

$$E_{X, P_X} = -\frac{50}{.25} \cdot \frac{2}{300} = -1.33$$

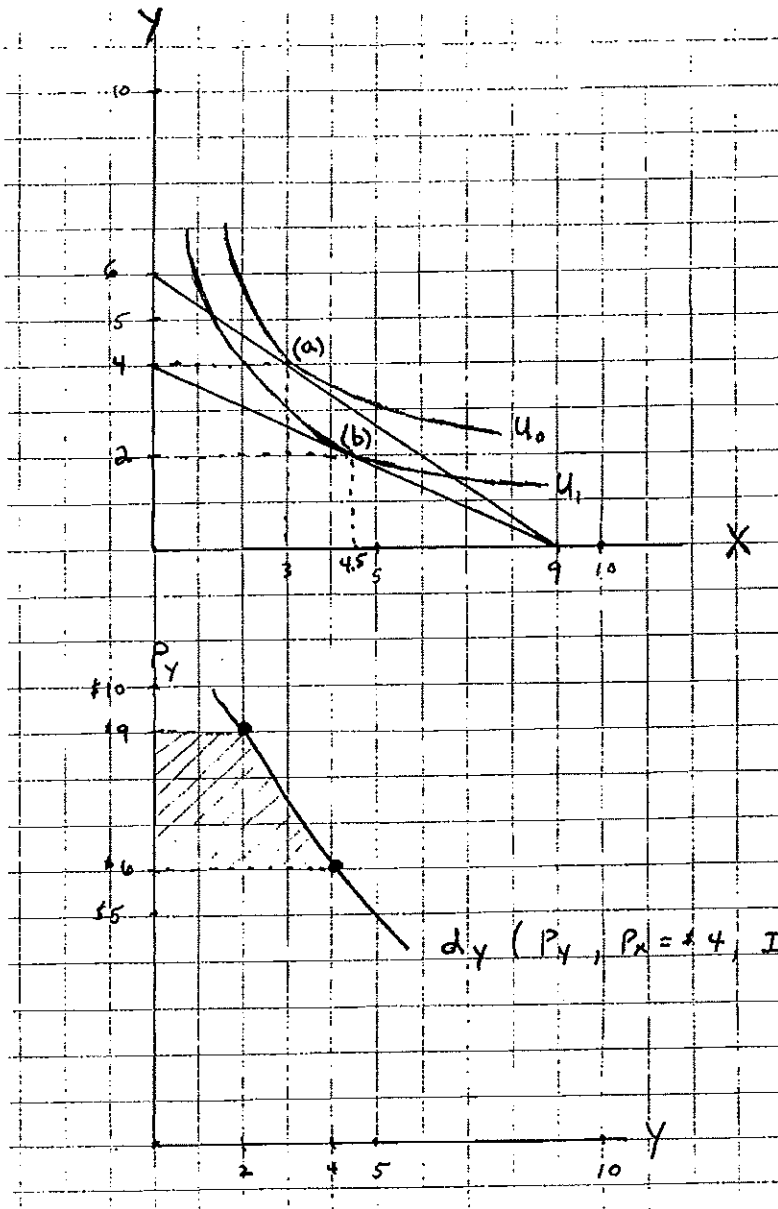
Blue version: $\frac{\Delta X}{\Delta P} = -\frac{50}{1.25}$, $X = 600$, $P_X = \$2.00$

$$E_{X, P_X} = -\frac{50}{1.25} \cdot \frac{2}{600} = -0.67$$

8. (20 pts.) Bart consumes beer and pizza. When his income rises, he consumes both more beer and more pizza too. When his weekly income is \$100, the price of beer is \$4 per six-pack, and the price of a pizza is \$5, Bart consumes 12.5 six packs of beer per week. When the price of pizza rises to \$10, Bart chooses to consume the same amount of beer, but reduces his consumption of pizza. Using a budget constraint-indifference curve diagram, illustrate Bart's initial consumption choice, and then illustrate his consumption choice after the price of pizza rises. Then show how you can separate out the income and substitution effects of this price change. Explain your diagram.



9. (25 pts.) Jack consumes two goods, X and Y. Jack's income is \$36. When $P_X = \$4$ and $P_Y = \$6$, Jack consumes $X=3$ and $Y=4$.
- Illustrate Jack's initial consumption choice in a budget constraint-indifference curve diagram.
 - Now the price of Y increases to $P_Y = \$9$. Jack's consumption of X increases to $X = 4.5$. Illustrate Jack's new budget constraint and indifference curve in your diagram.
 - Draw two points on Jack's demand curve for good Y.
 - Using the concept of consumer's surplus, give a dollar estimate of how much worse off Jack is when the price of Y rises from \$6 to \$9. Illustrate and briefly explain your answer.
 - Are X and Y substitutes or complements? Briefly explain your answer.



$$(a) \frac{I}{P_Y} = 6 \quad \frac{I}{P_X} = 9, \quad U_0$$

$$(b) \frac{I}{P_Y} = 4 \quad X = 4.5$$

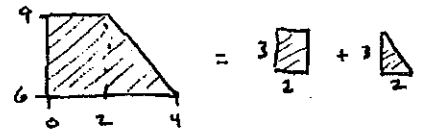
$$P_Y \cdot Y = I - P_X \cdot X = \$18$$

$$Y = 2, \quad U_1$$

$$(c) P_Y = \$6, \quad Y^* = 4$$

$$P_Y = \$9, \quad Y^* = 2$$

(d) change in consumer's surplus when P_Y rises from \$6 to \$9:



(e) when P_Y increases from \$6 to \$9, quantity demanded of X increases from 3 to 4.5. $E_{X, P_Y} > 0$, so X and Y are substitutes.