

**Problem 1:** Assume a person has a utility function  $U = XY$ , and money income of \$10,000, facing an initial price of X of \$10 and price of Y of \$15. If the price of X increases to \$15, answer the following questions:

- (a) What was the initial utility maximizing quantity of X and Y?
- (b) What is the new utility maximizing quantity of X and Y following the increase in the price of X?
- (c) What is the Hicks compensating variation in income that would leave this person equally well off following the price increase? What is the Slutsky compensating variation in income?
- (d) Calculate the pure substitution effect and the real income effect on X of this increase in the price of X. Distinguish between the calculation of these effects using the Hicksian analysis vs. the Slutsky analysis.

**Problem 2:** Suppose that the price elasticity,  $\epsilon$ , for cigarettes is 4, the price of cigarettes is \$3 per pack and we want to reduce smoking by 20%. What should we do?

**Problem 3:** Consumer consumes two goods with their prices  $P_X = 10$ ,  $P_Y = 80$  and has income  $I = 5000CZK$ . The demand function is given by  $X = 80 - 0.8P_X^2 - 0.5P_Y + 0.04I$ .

- (a) Are X and Y substitutes or complements?
- (b) Is X normal or inferior good?
- (c) What is price elasticity of demand for good X? What information does this give to the producer of good X?
- (d) What is cross elasticity of demand for good X if price of Y changes?
- (e) What is income elasticity of demand for good X?

**Problem 4:**

Peter's utility from CDs is given by  $TU_X = 1000X - 10X^2$ , where  $X$  is number of CDs bought per year. The price of a CD is 400 CZK and Peter's income is 200000 CZK per year.

- (a) How many CDs will Peter buy?
- (b) Determine Peter's consumer surplus.
- (c) Use indifference analysis to illustrate Peter's decision making and his consumer surplus.
- (d) How does consumer surplus change if the price of a CD increases to 500 CZK?
- (e) How many CDs in maximum is Peter willing to buy?