Problem set # 1
(budget constraint and preferences)

1. Peter is planning his holidays. Going to Austria for ten days has a total cost of €700 but the satisfaction he would get for that trip would be €1300. If he does not go to Austria he will work in a pub a he will get €60 per day. Peter likes this job. The quantification of the satisfaction he would get for that job is €250.
   a. What should Peter do during his holidays?
   b. Does his decision change if the job he can do is less attractive? In particular, although the salary is the same as before, he is only willing to do it for €30/day.

2. Paul has just bought a new cell phone. Each month he must pay a fixed amount of €15. The first 20 minutes of talk are included in this price. The cost of the next 100 minutes is 0.40€/minute and all the rest cost 0.20€/minute. Paul's total income is €67. He must allocate this money between minutes of phone-talking and bus tickets. One bus ticket costs €1. Represent graphically the Paul's budget constraint. What is the maximum amount of minutes Paul can talk on his cell phone?

3. During a drought the government decides to apply the following policy on the prices of water: each household can consume 500 $m^3$ of water at a price of 0.10€/$m^3$. Any additional $m^3$ will have a cost of €0.2. Households must allocate their income between water and food. The price for each unit of food is €20.
   a) Represent graphically and algebraically the budget constraint of a household that has a total income of €700.
   b) What is the opportunity cost of water?

4. Your budget constraint for goods A and B is 12A+ 4B=m where m represent the total income. Now, you are consuming more than 45 units of B. In order to increase your consumption of A in 5 units, how many units of good B should you give up?

5. Imagine two commodities that are bads. Is the slope of the indifference curves positive or negative?

6. Explain why it is not possible that two indifference curves cross each other when preferences hold the transitivity property.

7. Each semester Joe has €90 to expend between cinema and concerts. Each concert costs €18 and a cinema ticket costs €6.
   a) Which are the affordable bundles?
   b) Can Joe go to two concerts and watch three movies?
   c) What is the slope of the budget constraint?
   d) What is the opportunity cost of the concerts in terms of cinema movies?
e) Represent the new budget line if the price of concerts moves to €15. If Joe does not go to the cinema, how many concerts can he attend? Which are the relative prices?
f) What if the price of concerts is €22.50?
g) If there is a 25% increase in the prices and total income, how does the budget constraint change?
h) Imagine that the government fixes a 25% tax on the price of the cinema. Represent graphically the new budget line. Which is the new opportunity cost of going to the cinema?
i) Imagine that the government fixes a tax of €2 on the price of each concert. Represent the new budget line? Which is the new opportunity cost of going to the cinema?

**Multiple choice**

8. Suppose that the price of good x triples and the price of good y doubles while income remains constant. On a graph where the budget line is drawn with x on the horizontal axis and y on the vertical axis, the new budget line:
   (a) is flatter than the old one and lies below it.
   (b) is flatter than the old one and lies above it.
   (c) crosses the old budget line.
   (d) is steeper than the old one and lies below it.
   (e) is steeper than the old one and lies above it.

9. If two goods are both desirable and preferences are convex, then:
   (a) there must be a kink in the indifference curves.
   (b) indifference "curves" must be straight lines.
   (c) if two bundles are indifferent, then an average of the two bundles is worse than either one.
   (d) the marginal rate of substitution is constant along indifference curves
   (e) None of the above.

10. Ambrose has indifference curves with the equation $x_2 = k - 4x_1^{1/2}$ where larger constants correspond to higher indifference curves. If good 1 is drawn on the horizontal axis and good 2 on the vertical axis, what is the slope of Ambrose's indifference curve when his consumption bundle is (16,9)?
    (a) -16/9
    (b) -9/16
    (c) -0.50
    (d) -13
    (e) -4