

## MICROECONOMICS I

### Breaking the ice with exercises in microeconomics

1. A student has been admitted to Carlos III University for a Master program which has a 10-month length. Tuition fees are equal to 30,000 euros. Textbooks and other study materials cost about 2,500 euros. Overall mobility expenses are equal to 5,000 euros. The student lives in an apartment with a monthly rent of 800 euros. At the same time, the student has been offered a job paying 1,500 euros per month. If he accepted the job, he would live in the same apartment but have no mobility expenses. What is the opportunity cost of enrolling in the Master program for this student?
2. Pedro uses all his income to buy two goods:  $X$  and  $Y$ . His budget constraint is represented by the relationship:  $Y = 25 - 2X$ . Draw the budget constraint and answer the following questions.
  - (a) If Pedro buys 10 units of  $X$  and 5 units of  $Y$ , the opportunity cost of buying one more unit of  $X$  in terms of  $Y$  is equal to 1. True or false?
  - (b) If Pedro buys 9 units of  $X$  and 7 units of  $Y$ , the opportunity cost of buying one more unit of  $X$  in terms of  $Y$  is equal to 2. True or false?
  - (c) The opportunity cost of  $X$  in terms of  $Y$  is constant along the budget constraint and equal to 0.5. True or false?
  - (d) The opportunity cost of  $X$  in terms of  $Y$  is constant and equal to 2. True or false?
3. Mamen has 20 euros a week to spend. She spends them either on junk food (at 2.50 euros per snack) or on gasoline (at 2 euros per liter). Draw Mamen's opportunity set. What is the trade-off between junk food and gasoline? Now consider (and draw) the effects on her budget constraint of the following occurrences:
  - (a) every week, a generous relative starts sending her 10 euros;
  - (b) the price of junk food falls to 2 euros;
  - (c) the price of gasoline rises to 2.50 euros.
4. Manny likes to divide his spare time between going to movies and listening to CDs. He has 20 hours a week available for recreation; a movie takes two hours, and a CD takes one hour. Draw his time constraint. Moreover, Manny has a limited amount of income to spend on recreation: assume that he has 60 euros a week, and that a movie costs 10 euros while a CD costs 15 euros (he never likes to listen to the same CD twice). Draw his budget constraint. What is Manny's overall opportunity set?
5. The President of Harvard University can use an annual budget of 500,000 \$ either to hire new professors or to assign fellowships to worthy students. Professors earn a wage of 50,000 \$ per year; students can get a fellowship of 10,000 \$ per year. Describe the opportunity set of Harvard's President. What is the opportunity cost of hiring a new professor? Describe the change of the opportunity set associated to a decrease of 20,000 \$ in professors' wage.
6. Tommaso's weekly wage is equal to 1,000 \$. He spends all his wage in the consumption of two goods: Red Sox gadgets ( $X$ ) and beer ( $Y$ ). The market price of Red Sox gadgets averages 50 \$, while the price of one pint of beer is 5 \$. Draw Tommaso's opportunity set. Now assume that the vendors of gadgets make a special offer: above 10 units of consumption, any additional unit can be bought at half price (25 \$). Similarly, pubs introduce a discount policy: above 25 pints of beer per month, any additional pint can be bought at 2.5 \$. Draw the new budget constraint associated to these special offers.
7. Assume that Spain can produce either books or toys. Labor is the only factor of production. The available amount of labor is fixed and equal to 1,000 working hours. The production of a single book requires one hour of work, while the production of a toy requires two hours. Draw Spain's production possibilities frontier (PPF). In this case, the PPF is linear or concave? Why?