

Teoría Económica II

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TO BE HANDED IN NOVEMBER 8

1. Thelma and Louise finally got into college. Thelma can write term papers at the rate of 10 pages per hour and solve workbook problems at the rate of 3 per hour. Louise can write term papers at the rate of 6 pages per hour and solve workbook problems at the rate of 2 per hour.
 - (a) Which of the two has an *absolute* advantage in solving workbook problems? What about in writing term papers? Which of the two has a *comparative* advantage in solving workbook problems? What about in writing term papers?
 - (b) Thelma and Louise each work 6 hours a day. They decide to work together and to produce a combination of term papers and workbook problems that lies on their joint production possibility frontier. Draw a graph of their individual and of their joint production possibility frontiers; use pages of term papers as the x -axis and problems solved as the y -axis.
 - (c) If they decide to produce less than 60 pages of term papers, who will write them? How many pages of term papers can they jointly produce if only one of them writes the term papers?
2. Adam and Eve live in “Paradise” island. They consume apples (A, that they eat) and grapeleaves (G, that they wear). Eve has her own business producing apples (the firm is called Apple and she is the sole shareholder), and Adam has his own business producing grapeleaves (the firm is called Levis-Grape and Adam is the sole shareholder). Both of them can work in both firms. If they spend one hour of their leisure producing apples, each of them produces 4 apples. If they work one hour producing grapeleaves, each of them produces 3 grapeleaves. Therefore, production functions are given by

$$\begin{aligned}f_A(L) &= 4L, \\f_G(L) &= 3L.\end{aligned}$$

Adam and Eve each have 5 hours of leisure time per day (L) as initial endowment and they possess neither apples nor grapeleaves

$$\begin{aligned}\omega_a &= (L = 5, A = 0, G = 0), \\ \omega_e &= (L = 5, A = 0, G = 0).\end{aligned}$$

Leisure does not enter their utility functions, which are given by

$$\begin{aligned}U_a(G, A) &= 6 + \frac{4}{10} \log G + \frac{6}{10} \log A, \\ U_e(G, A) &= 8 + \log G + \log A.\end{aligned}$$

Suppose leisure time (spent working) is the *numeraire*, i.e. $p_L = 1$.

- (a) What type of returns to scale do the production functions of apples and grapeleaves display?
- (b) Draw the joint production possibility frontier (in apples–grapeleaves space). What are the slopes?
- (c) What are prices for apples and grapeleaves? (*Hint*: Maximize profits of Adam’s firm relative to contracted labor and do the same for Eve’s firm; make sure they both want to produce positive but not infinite amounts.)
- (d) Write down Adam and Eve’s budget set (*Hint*: Remember that both Adam and Eve are sole shareholders of their own firms.)
- (e) What is the amount of labour that Adam and Eve supply? (*Hint*: Notice that leisure does not enter their utility functions and that both of them are endowed with 5 hours of leisure.)
- (f) Maximize their utility functions subject to their budget constraints and solve for optimal quantities of apples and grapeleaves demanded.
- (g) What is the supply of apples and grapeleaves in equilibrium? Check that the labor market clears.
- (h) Is this equilibrium efficient? (*Hint*: Is it possible to improve somebody’s welfare, without affecting anybody else’s?)
- (i) For the level of production computed in (g), compute all the efficient allocations between Adam and Eve. (*Hint*: Notice that Eve’s consumption of apples and grapeleaves is equal to total production minus Adam’s consumption.)