Universität ⬆ Siegen

Fakultät III – Wirtschaftswissenschaften
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Exam "International Trade"
Winter Semester 2020-21
(1ˢᵗ Exam Period)

Solution

Available time: 60 minutes

For your attention:

1. The exam is made up of 6 pages (including this cover page). Please check and see if the exam you are holding is **complete**.

2. For your answers, please write the answers on your own blank paper <u>in the order of the questions</u> (as much as possible, for the convenience of correction). For the graphic questions, you are required to draw everything on your own sheet.

3. ATTENTION: The names for variables have the same meaning as in the lecture. Insofar as you also use the same symbols for the variables as we did in the lecture you will not have to define these any further.

Question	1	2	3	4	Sum	Mark
Points achievable	16	16.5	14	13,5	60	
Points achieved						

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Problem 1:   Unit Values

We look at a country that imports three categories of goods (i = 1, 2, 3) in the period under consideration (period t).

a) The following table shows the prices of the varieties (j= 1,2) of goods category 1 in period t (p_{1jt}). In addition, it shows the import quantities of the two varieties (IM_{1jt}) in t.

	p_{1jt}	IM_{1jt}
j = 1	2	20
j = 2	5	10

Please calculate the import unit value of goods category 1. Please show your calculation.   [5 points]

$$\overline{p_{IM\ 1t}} =$$

Solution: (0.5) (0.5)   (0.5) (0.5)

$$\overline{p_{IM\ 1t}} = \frac{\sum_j p_{IM\ 1jt} \cdot IM_{1jt}}{\sum_j IM_{1jt}} = \frac{2 \cdot 20 \ + \ 5 \ \cdot \ 10}{20 \ + \ 10} = \frac{40 + 50}{30} = \frac{90}{30} = 3$$

(1)

                          (1)   (1)

b) For goods categories 2 and 3, we are given the following import unit values and import quantities in period t:

$$\overline{p_{IM\ 2t}} = 2, \ IM_{2t} = 20, \quad \overline{p_{IM\ 3t}} = 15, \quad IM_{3t} = 10 \ .$$

In the base period, the unit values were $\overline{p_{IM\ 0t}} = 1, \overline{p_{IM\ 20}} = 3, \overline{p_{IM\ 30}} = 5$

Please calculate the index of import values for period t. Please show your calculation.   [7 points]

$$\overline{P_{IM\ t,0}} =$$

Solution :   (0.5) (0.5)   (0.5) (0.5)   (0.5) (0.5)

$$\overline{P_{IM\ t,0}} = \frac{\sum_i \overline{p_{IM\ 1t}} \cdot IM_{it}}{\sum_i \overline{p_{IM\ 10}} \cdot IM_{it}} = \frac{3 \cdot 30 \ + \ 2 \cdot 20 \ + \ 15 \cdot 10}{1 \cdot 30 \ + \ 3 \cdot 20 \ + \ 5 \cdot 10} = \frac{280}{140} = 2$$

                          (0.5) (0.5)   (0.5) (0.5)   (0.5) (0.5)   (1)

c) What does the index of unit values calculated in b) have in common with the Paasche price index, what is the difference?   [4.5 points]

Solution:

Common feature: quantities of reporting period
                              (1)   (1)

Difference: index above uses unit values while Paasche uses prices
                              (1)   (1)

Problem 2: Causes and Consequences of International Trade

We look at two countries with identical supply sides; in the following graph, this is represented by a transformation curve that is identical for both countries. However, consumption preferences differ between both countries. In autarky, country I consumes and produces in point I while the second country consumes and produces in point II.


X_1^I, C_1^I
X_1^{II}, C_1^{II}

I

II

0

X_2^I, C_2^I
X_2^{II}, C_2^{II}
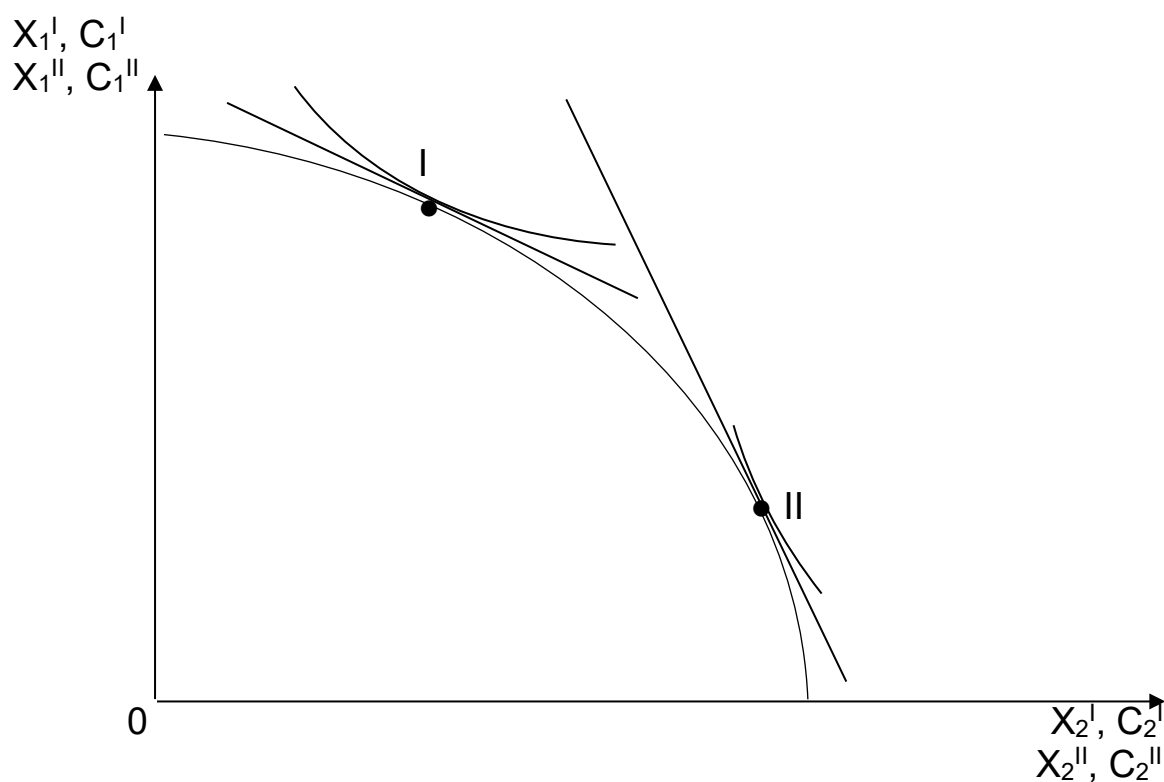
Please reproduce the graph on your solution page (without the symbols on the axes)

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a) Now, both countries engage in trade with each other. In the above graph, please:
- draw the price line that establishes in the common market
- indicate the production points as P^I , P^{II}
- indicate the consumption points as C^I , C^{II}; please also draw the corresponding indifference curves

[8 points]

Solution:
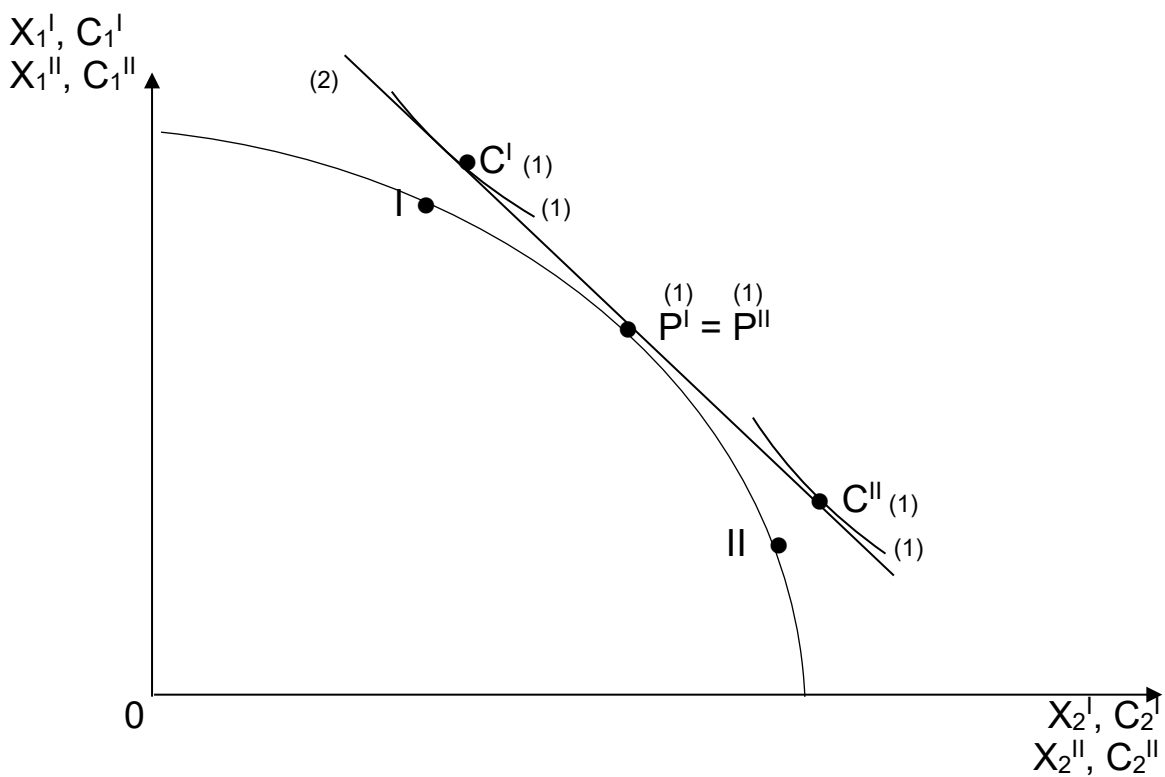
b) How does the price ratio p_2/p_1 change for country I? [1 point]

Solution: increases (1)

c) Starting from that price change, please describe the resulting changes (increase, decrease, unchanged) of production (X_1^I) and consumption (C_1^I) of good 1 in country I. Please briefly explain your answers. [4 points]

X_1^I:

C_1^I:

Solution:

X_1^I: decreases because rise of p_2/p_1 makes production of good 1 less profitable
        (1)   (1)
C_1^I: increases because good 1 becomes relatively cheaper
        (1)   (1)

d) Which good will be exported by country I? Why? [3.5 points]

Solution:

Country I will export good 2   (2)

Reason: for good 2, its production exceeds its consumption
                              (0.5)   (0.5)   (0.5)

Problem 3: The Two-Country Ricardo Model

Consider two countries, Foreign (F) and Home (H), that differ only in their labour productivities. Both countries can produce two homogeneous goods, 1 and 2, and each nation has an identical endowment of labor units $(N^s)^H = 10{,}000 = (N^s)^F$.

The domestic economy's specific production functions are $X_i = N_i/h_i$ for i = 1,2, where h_i denotes the labor coefficients of good i.

a) Given $h_1 = 10$ and $h_2 = 10$, derive the equation for the domestic economy's
    production possibility frontier.   [5 points]

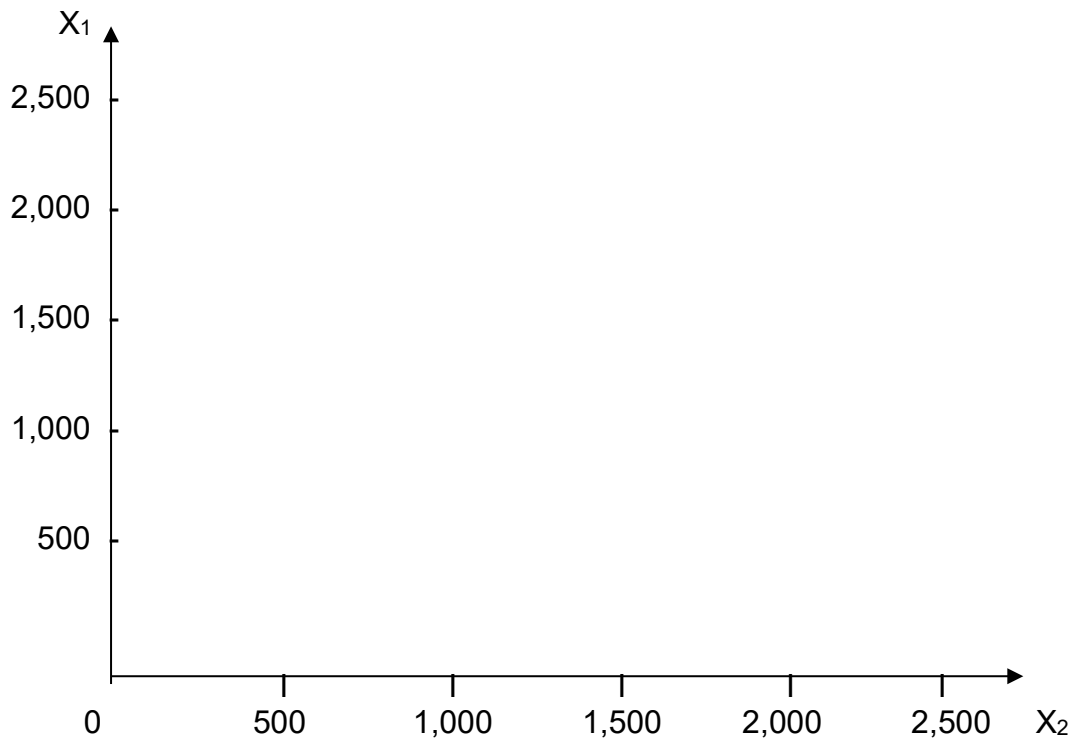**Solution:**

10,000 = 10X_1 + 10X_2 (2)

   X_1 = 10,000/10 – (10/10) X_2 =   1,000 – X_2 (3)

(or: X_2 = 10,000/10 – (10/10) X_1 = 1,000 - X_1)

b) Please draw the domestic economy's production possibility frontier in the following diagram. [2.5 points]
**Please reproduce the graph on your solution page (without the symbols on the axes)**
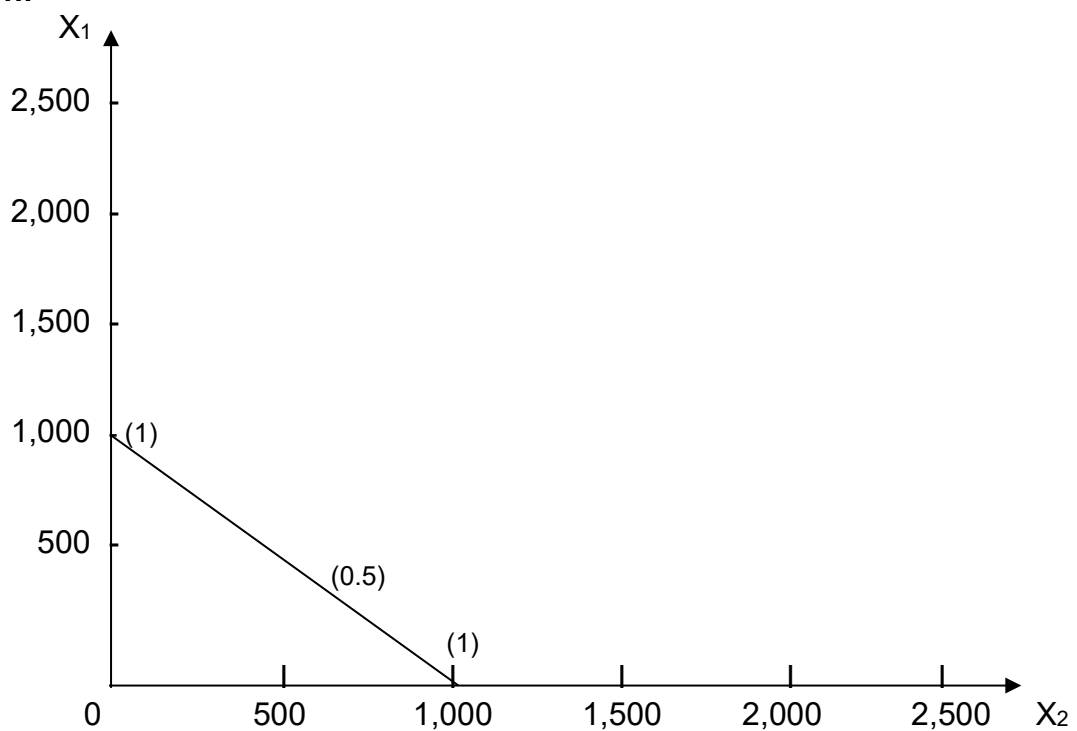
Solution:

c) Now assume that Foreign has an absolute advantage for good 1 while Home has an absolute advantage for good 2. Please draw the world production possibility frontier under correct specialization, i. e. when both countries specialize in the right way.   [6.5 points]
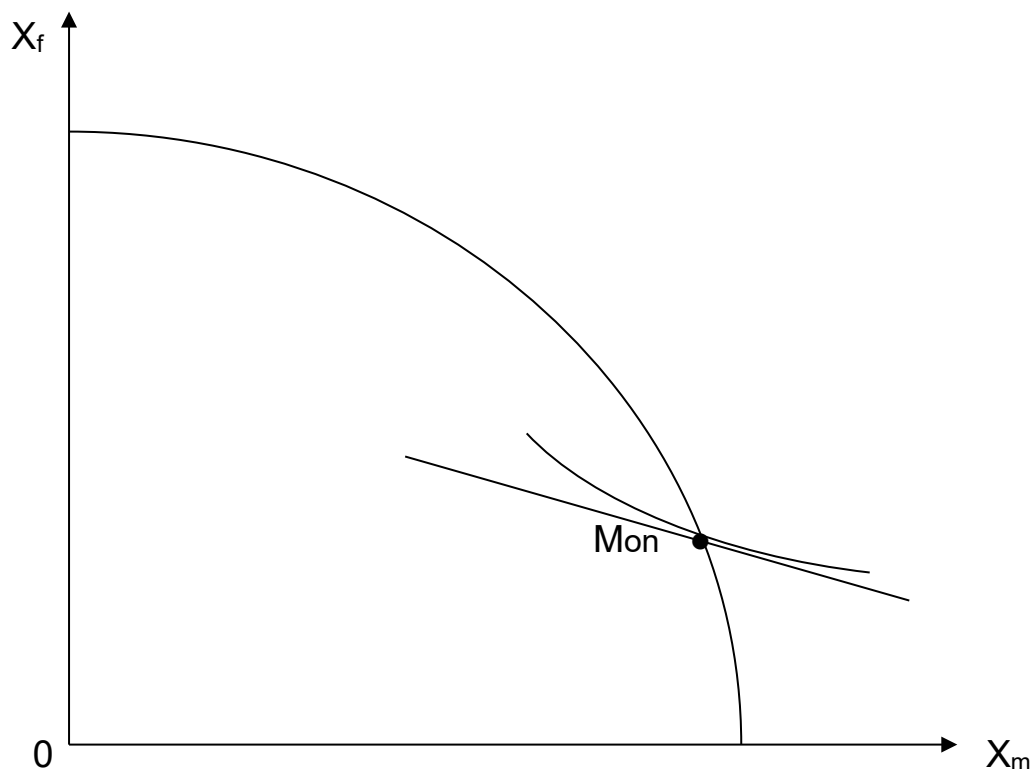
Solution:

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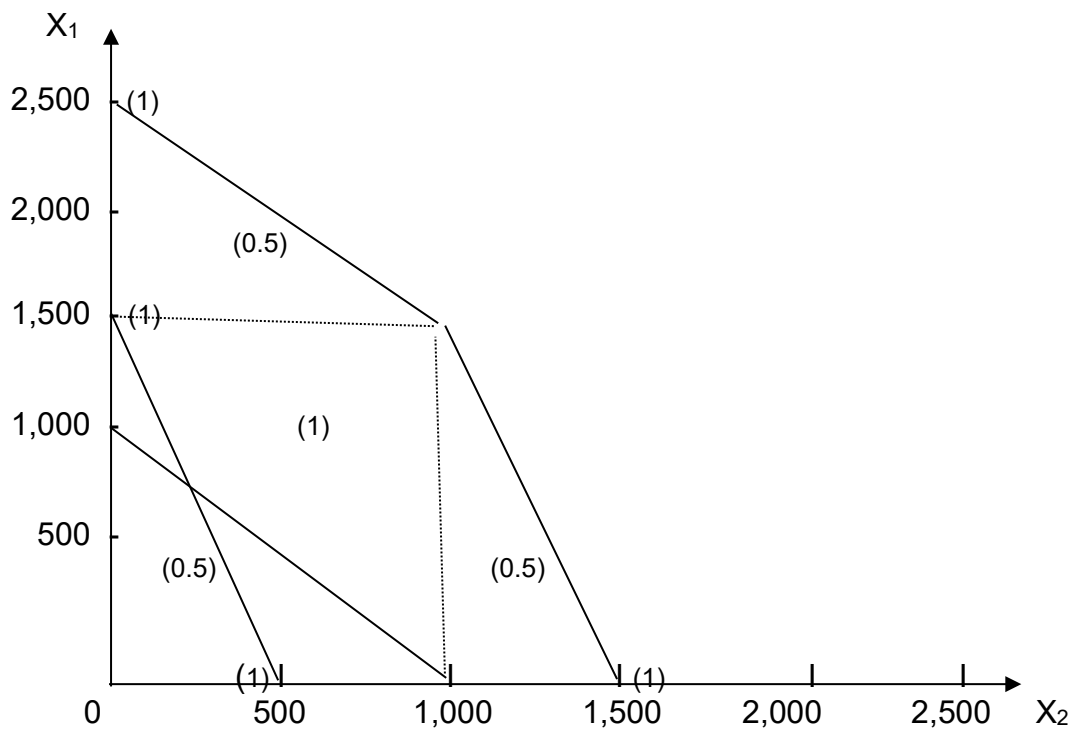
Problem 4: General Equilibrium Analysis when there is a Monopoly in the Food Sector

We consider a two-sector economy:

-   in the sector of manufactured goods (m), there is perfect competition

-   in the sector of food (f), there is only one producer

-   both sectors use capital and labour inputs.

We assume that factor markets are perfectly competitive. Factor prices therefore are given for any single market participant. Consumers maximize utility while producers maximize profit.

We want to analyse the economy with the help of the following graph.

a) Point Mon describes the autarky equilibrium.

   a$_1$ Why is the price line in Mon flatter than the transformation curve:

$$\frac{p_m}{p_f} \;<\; \left(\frac{d\,X_f}{d\,X_m}\right)^{MRT} ?$$ [4 points]

Solution: the producer of food charges a price above marginal cost
                                          (1)   (1)   (1)   (1)

a2 How must we modify the model so that in the autarky equilibrium, the price line
   is tangent to the transformation curve?

                                                                              [2.5 points]
   Solution:

   Perfect competition (or: many producers) in the food sector
      (0.5)   (1.5)   (0.5)
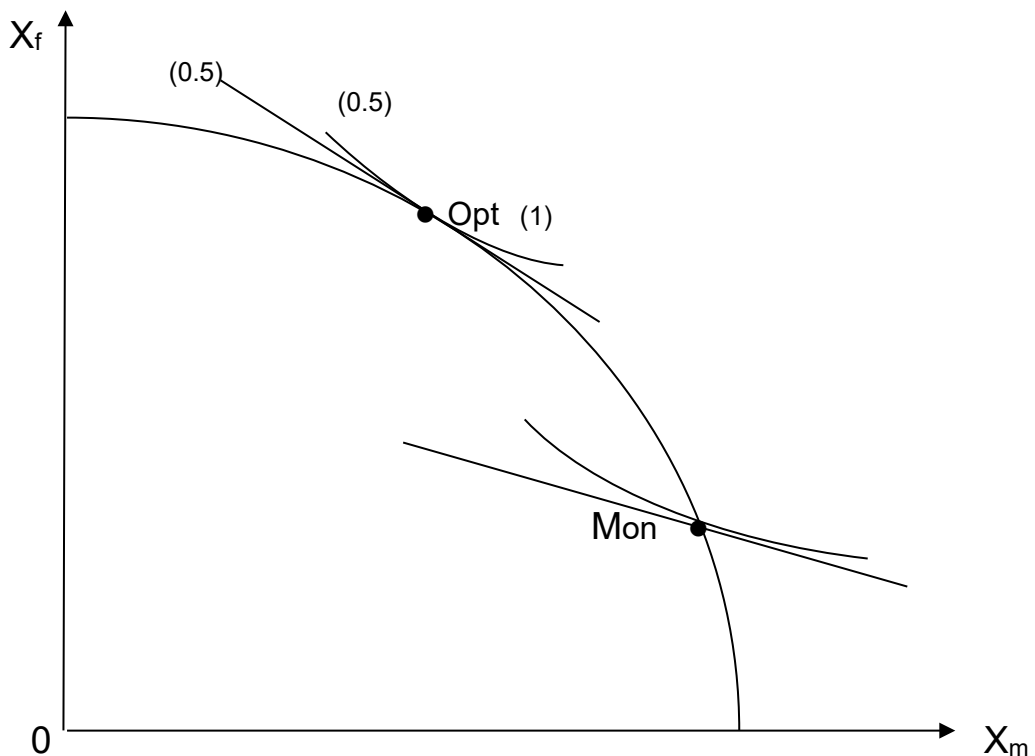
   (or: subsidize food)

a3 In the above graph, please indicate as point Opt the autarky equilibrium where
   the price line is tangent to both the transformation curve and to an indifference
   curve. (Please draw the corresponding price line and indifference curve!)
                                                                              [2 points]
Please reproduce the graph on your solution page (without the symbols on the axes)

   Solution:

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b) Now the economy opens for trade. The foreign country has the same features as the domestic one; most of all, there is a monopoly in the food sector. In the above graph, please draw the equilibrium point with trade (point Duo). In point Duo, please also draw the price line and the indifference curve.   [5 points]

Solution: Point Duo correct: 2
                                                             Price line in Duo:
                                                                - steeper than in Mon: 1
                                                                - flatter than transform. curve: 1
                                                             Indiff. curve in Duo tangent to price line: 1