Microeconomics 1021A

Chapter 2: The Economic Problem

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Content

- Problems 11, 13, 14, 20 (p.55)

Key terms

- Production possibilities frontier (PPF)
- Production efficiency
- Opportunity cost
- Allocative efficiency
- Marginal cost
- Marginal benefit
- Comparative advantage

Problem 2.11

Suppose that Yucatan's production possibilities are:

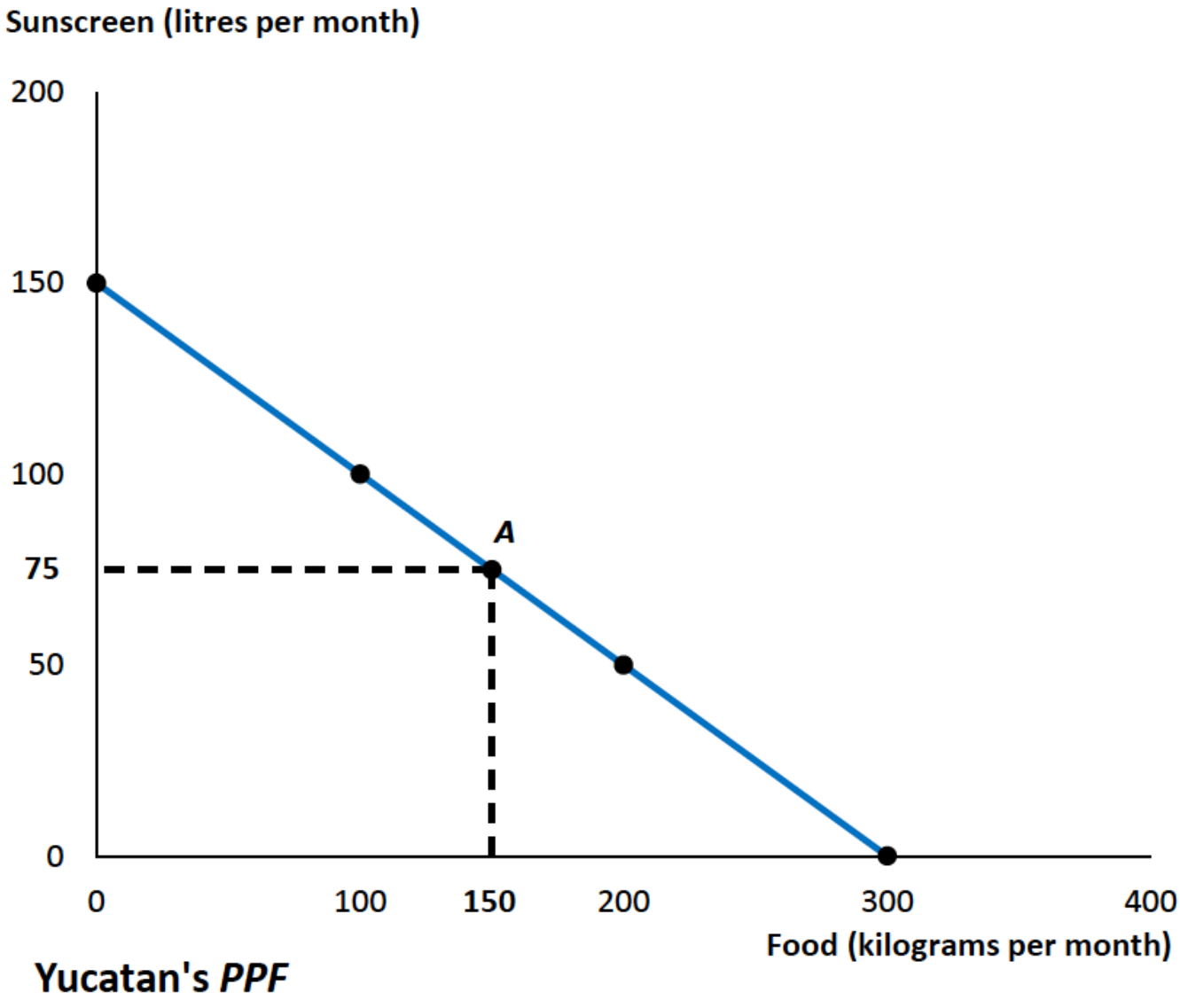
Food (kilograms per month)		Sunscreen (litres per month)
300	and	0
200	and	50
100	and	100
0	and	150

Problem 2.11

(a) Draw a graph of Yucatan's PPF and explain how your graph illustrates a tradeoff.
(b) If Yucatan produces 150 kilograms of food per month, how much sunscreen must it produce if it achieves production efficiency?
(c) What is Yucatan's opportunity cost of producing (i) 1 kilogram of food and (ii) 1 litre of sunscreen?
(d) What is the relationship between your answers to part (c)?

Problem 2.11

Problem 2.11



Yucatan's *PPF*

Problem 2.11 SOLUTIONS

(a) The graph illustrates a tradeoff because **production of one good can only be increased if production of the other good is decreased** as we move along the graph.

(b) Allocative efficiency = **on the PPF**. 150 kilograms of food per month: 75 litres of sunscreen.

(c) 1 kg of food : 0.5 L of sunscreen. Likewise, 2 kg food: 1 L sunscreen.

(d) The opportunity costs of the two goods are **inversely related**.

Problem 2.13

In Problem 2.11, what is the marginal cost of 1 kilogram of food in Yucatan when the quantity produced is 150 kilograms per day? What is special about the marginal cost of food in Yucatan?

Problem 2.13 SOLUTION

- The marginal cost of 1 kilogram of food in Yucatan is **constant** at all points along Yucatan's PPF and is equal to 0.5 litres of sunscreen per kilogram of food.
- Constant marginal cost = linear PPF.

Problem 2.14

The table describes the preferences in Yucatan.

Sunscreen (litres per month)	Willingness to pay (kilograms of food per litre)
25	3
75	2
125	1

Problem 2.14

(a) What is the marginal benefit from sunscreen and how is it measured?

(b) Using the table from Problem 2.11, what does Yucatan produce to achieve allocative efficiency?

Problem 2.14 SOLUTION

(a) The marginal benefit from sunscreen is the **benefit enjoyed by the person who consumes 1 more** litre of sunscreen. It is equal to the willingness to pay for an additional litre.

(b) Allocative efficiency = Yucatan is **producing at the point on the PPF that is most preferred.**: MB = MC.

MC of 1 L of sunscreen = 2 kg of food.

$\Longrightarrow$ MB = 2.

$\Longrightarrow$ Yucatan should produce 75 L of sunscreen.

$\Longrightarrow$ to be at the PPF, Yucatan must produce 150 kg of food.

Problem 2.20

Tony and Patty produce skis and snowboards. The tables show their production possibilities. Each week, Tony produces 5 snowboards and 40 skis; Patty produces 10 snowboards and 5 skis.

Problem 2.20

Tony's Production Possibilities

Snowboards (units per week)		Skis (units per week)
25	and	0
20	and	10
15	and	20
10	and	30
5	and	40
0	and	50

Patty's Production Possibilities

Snowboards (units per week)		Skis (units per week)
20	and	0
10	and	5
0	and	10

Problem 2.20

(a) Who has the comparative advantage in producing (i) snowboards and (ii) skis?

(b) If Tony and Patty specialize and trade 1 snowboard for 1 ski, what are the gains from trade?

Problem 2.20 SOLUTIONS

(a) The worker who has the comparative advantage in producing snowboards is the one who has the **lowest opportunity cost** of producing 1 snowboard.

Tony: 1 snowboard: 2 skis Patty: 1 snowboard: 0.5 skis

$\Longrightarrow$ Patty has the lower opportunity cost

$\Longrightarrow$ Patty has the comparative advantage of producing snowboards.

Problem 2.20 SOLUTIONS

(b) Gains from trade. $20 - 15 = 5SB$; $50 - 45 = 5Skis$

Currently,

	Snowboards	Skis
Tony	5	40
Patty	10	5
Total	**15**	**45**

If Tony and Patty specialize and trade,

	Snowboards	Skis
Tony	0	50
Patty	20	0
Total	**20**	**50**

Recap

- Production efficiency is achieved at the PPF.
- The PPF illustrates graphically the opportunity cost of producing one good in terms of the other.
- Constant marginal cost = Linear PPF.
- Allocative efficienty is achieved at the PPF point that is most preferred. MB = MC.
- Comparative advantage = lowest opportunity cost.