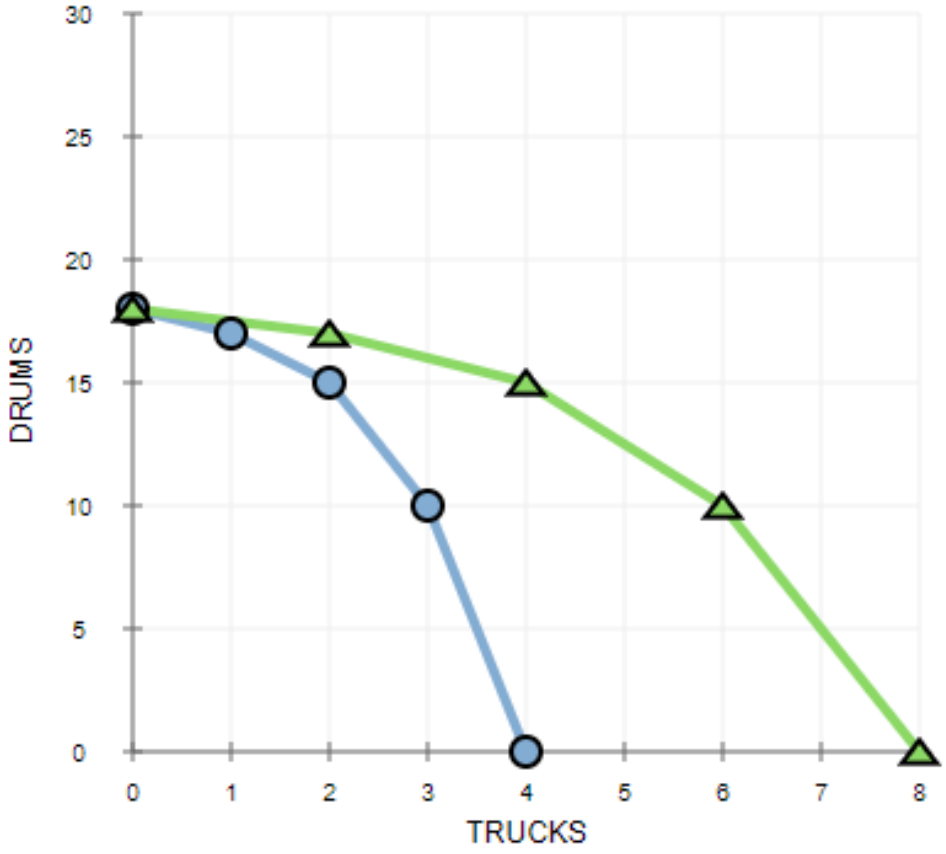
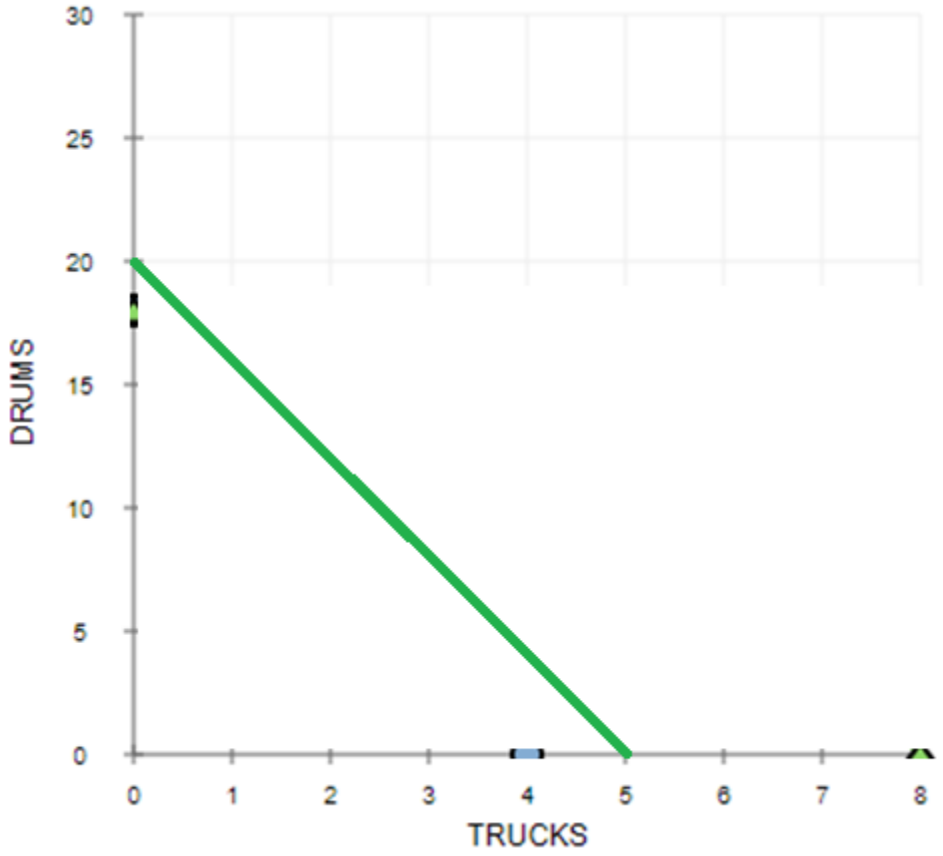
PPF and the opportunity cost



Choice	Hours Producing (Trucks)	Hours Producing (Drums)	Produced (Trucks)	Produced (Drums)
A	8	0	4	0
B	6	2	3	10
C	4	4	2	15
D	2	6	1	17
E	0	8	0	18

PPF and the opportunity cost



Chapter 3

Interdependence and the Gains from Trade

A Parable for the Modern Economy

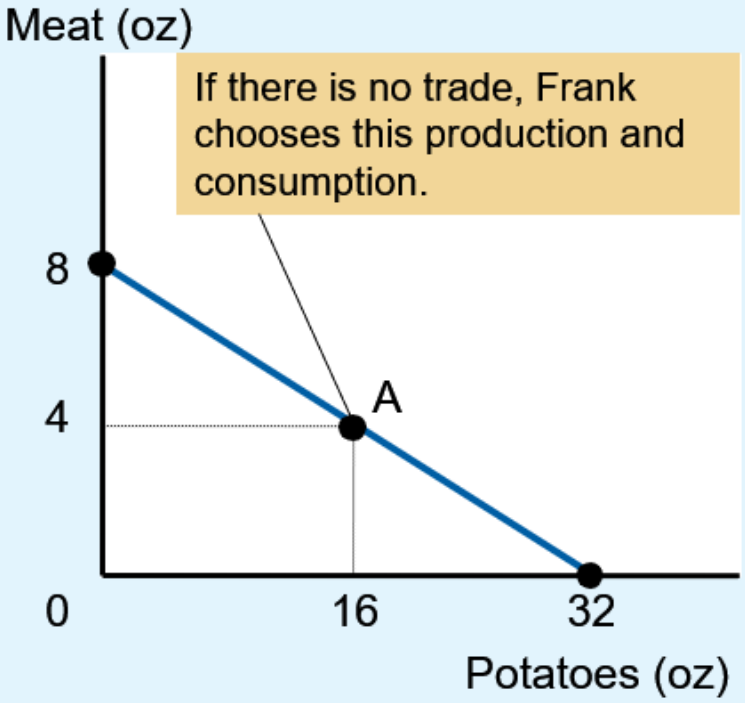
- Only two goods
  - Meat
  - Potatoes
- Only two people
  - A cattle rancher named Ruby
  - A potato farmer named Frank
  - Both would like to eat both meat and potatoes

Figure 1 The Production Possibilities Frontier

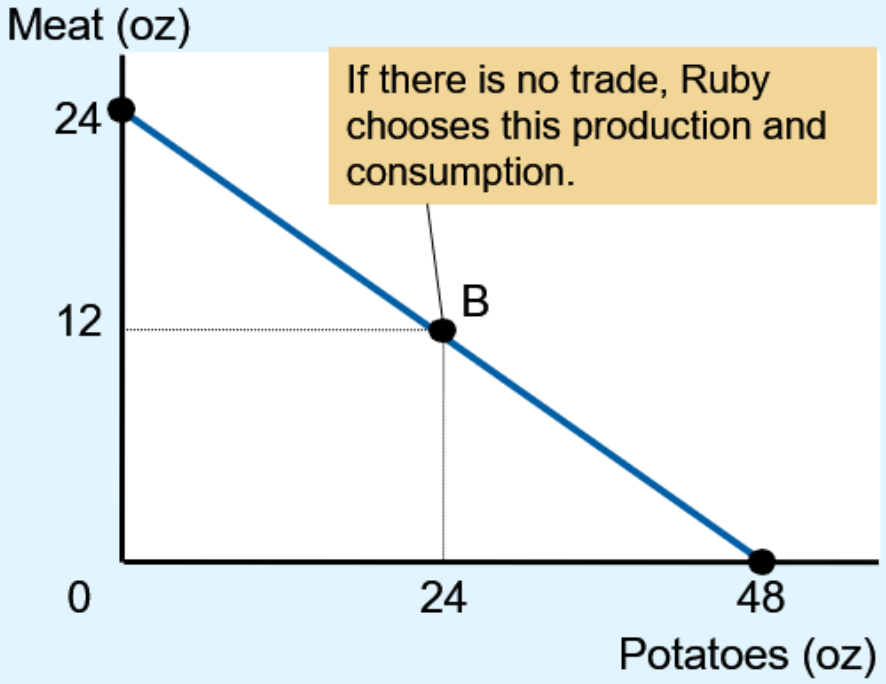
	Minutes needed to make 1 ounce of meat	Minutes needed to make 1 ounce of potatoes	Amount of meat produced in 8 hours	Amount of potatoes produced in 8 hours
Frank the farmer	60 minutes per ounce	15 minutes per ounce	8 ounces	32 ounces
Ruby the rancher	20 minutes per ounce	10 minutes per ounce	24 ounces	48 ounces

Figure 1 The Production Possibilities Frontier

Frank's production possibilities frontier



Ruby's production possibilities frontier



A Parable for the Modern Economy

- Specialization and trade
  - Farmer Frank specializes in growing potatoes
    - More time growing potatoes
    - Less time raising cattle
  - Rancher Ruby specializes in raising cattle
    - More time raising cattle
    - Less time growing potatoes
  - Trade: 5 oz of meat for 15 oz of potatoes

Figure 2 How Trade Expands the Set of Consumption Opportunities

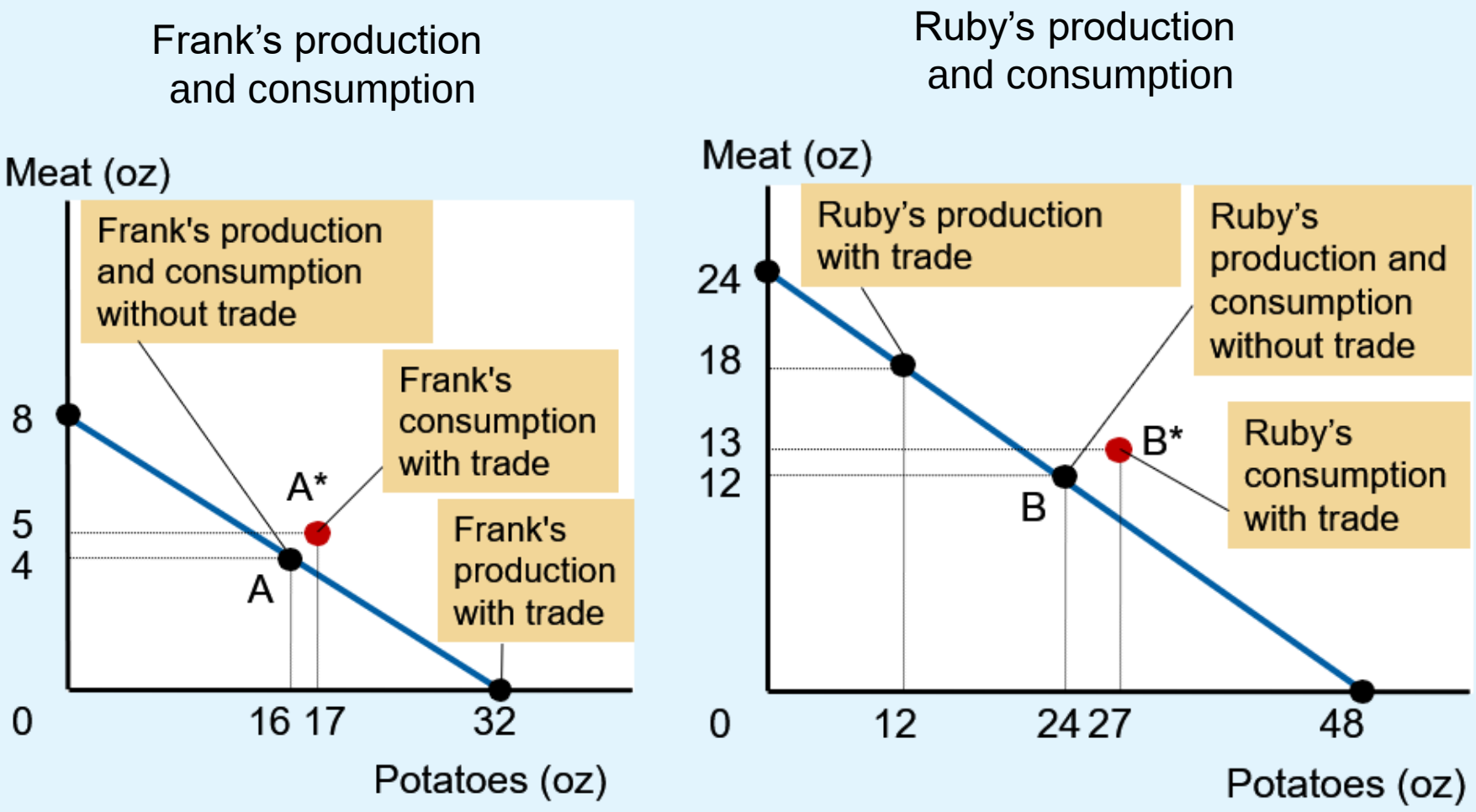


Figure 2 How Trade Expands the Set of Consumption Opportunities

	Frank's meat	Frank's potatoes	Ruby's meat	Ruby's potatoes
Production and consumption without trade	4 ounces	16 ounces	12 ounces	24 ounces
Production with trade	0 ounce	32 ounces	18 ounces	12 ounces
Trade	Gets 5 ounces	Gives 15 ounces	Gives 5 ounces	Gets 15 ounces
Consumption with trade	5 ounces	17 ounces	13 ounces	27 ounces
Increase in consumption with gains from trade	Increase of 1 ounce	Increase of 1 ounce	Increase of 1 ounce	Increase of 3 ounces

Comparative Advantage

- Absolute advantage
  - The ability to produce a good using fewer inputs than another producer
  - In producing meat: Ruby
    - Ruby needs 20 min. to produce 1 oz of meat
    - Frank needs 60 minutes
  - In producing potatoes: Ruby
    - Ruby needs 10 min. to produce 1 oz of potatoes
    - Frank needs 15 minutes

Comparative Advantage

- Opportunity cost
  - Whatever must be given up to obtain some item
  - Measures the trade-off between the two goods that each producer faces

Comparative Advantage

- Opportunity cost
  - Frank: 60 min. to produce 1 oz meat, and 15 min. to produce 1 oz potatoes
    - To produce 1 more oz meat, give up 4 oz potatoes
    - To produce 1 more oz potatoes, give up ¼ oz meat
  - Ruby: 20 min. to produce 1 oz meat, and 10 min. to produce 1 oz potatoes
    - To produce 1 more oz meat, give up 2 oz potatoes
    - To produce 1 more oz potatoes, give up ½ oz meat

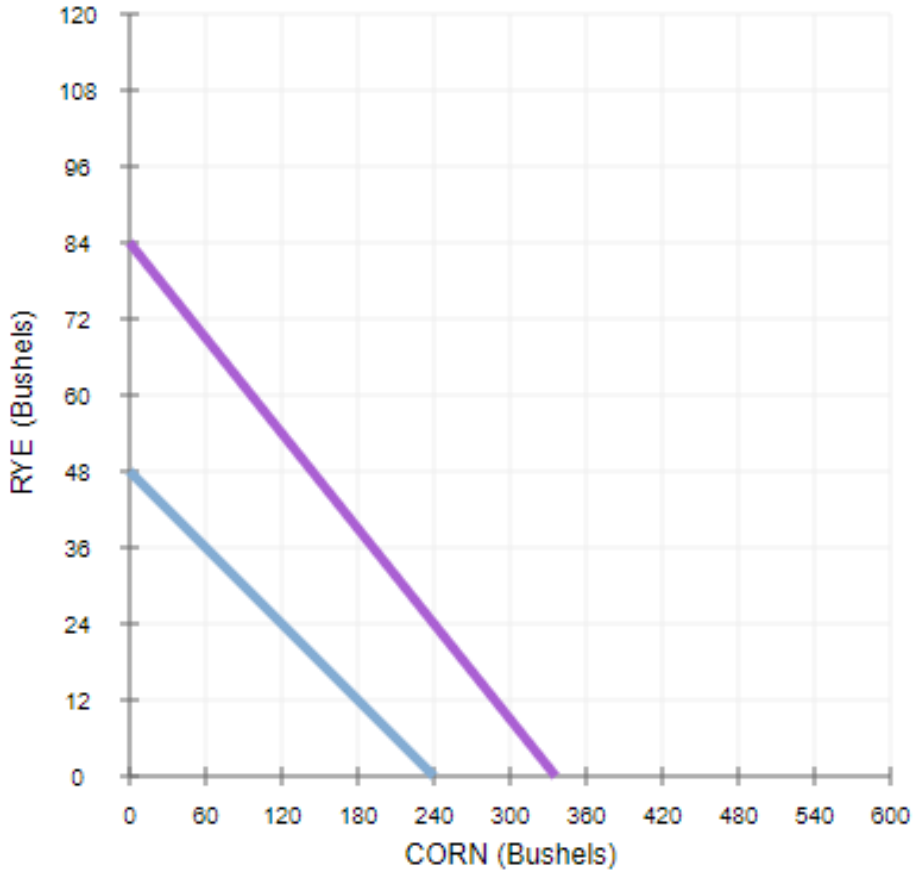
Table 1 The Opportunity Cost of Meat and Potatoes

	Opportunity cost of 1 ounce of meat	Opportunity cost of 1 ounce of potatoes
Frank the farmer	4 ounces of potatoes	One-quarter ounce of meat
Ruby the rancher	2 ounces of potatoes	One-half ounce of meat

Comparative Advantage

- Comparative advantage
  - The ability to produce a good at a lower opportunity cost than another producer
  - Reflects the relative opportunity cost
- Principle of comparative advantage
  - Each good should be produced by the individual that has the smaller opportunity cost of producing that good
  - Specialize according to comparative advantage

Example: opportunity cost



	Corn (Bushels per acre)	Rye (Bushels per acre)
Kevin	20	4
Maria	28	7

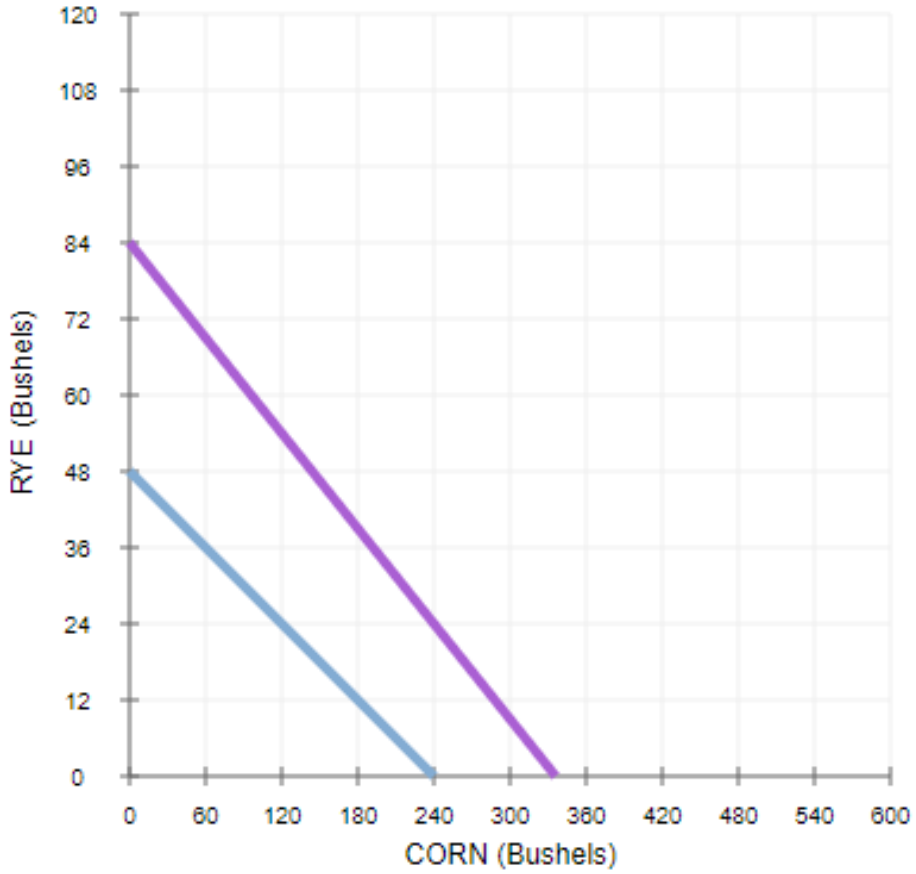
Each one owns a 12-acre plot of land.

Kevin's opportunity cost.

Corn:

Rye:

Example: opportunity cost



	Corn (Bushels per acre)	Rye (Bushels per acre)
Kevin	20	4
Maria	28	7

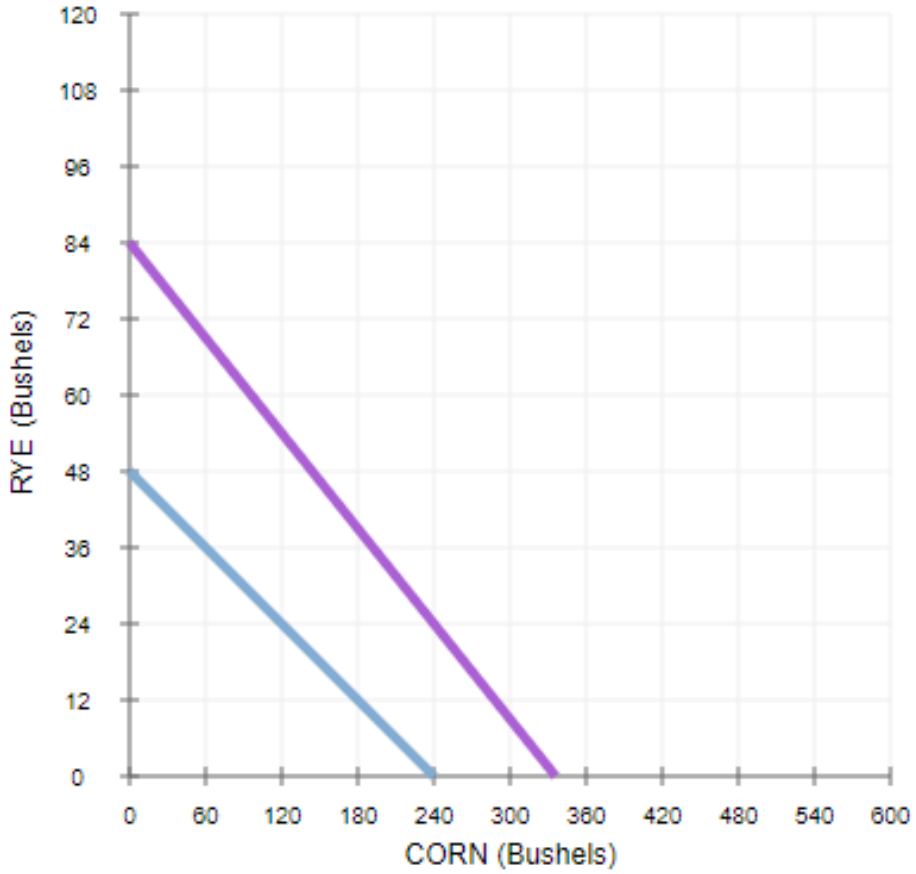
Each one owns a 12-acre plot of land.

Maria's opportunity cost.

Corn:

Rye:

Example: comparative advantage



	Corn (Bushels per acre)	Rye (Bushels per acre)
Kevin	20	4
Maria	28	7

Kevin's opportunity cost.

Corn: 4/20=1/5

Rye: 20/4=5

Maria's opportunity cost.

Corn: 7/28=1/4

Rye: 28/7=4

Comparative Advantage

- One person
  - Can have absolute advantage in both goods
  - Cannot have comparative advantage in both goods
- For different opportunity costs
  - One person has comparative advantage in one good
  - The other person has comparative advantage in the other good

Comparative Advantage

- Opportunity cost of one good
  - Inverse of the opportunity cost of the other
- Gains from specialization and trade
  - Based on comparative advantage
  - Total production in economy rises
    - Increase in the size of the economic pie
    - Everyone is better off

Thursday class

Benefits of trade…

Comparative Advantage

- Trade can benefit everyone in society
  - People **specialize** in activities in which they have a **comparative advantage**
- The price of trade
  - **Between** the two **opportunity costs**
- The principle of comparative advantage explains:
  - Interdependence
  - Gains from trade

Applications of Comparative Advantage

Should the U.S. trade with other countries?

- Imports
  - Goods produced abroad and sold domestically
- Exports
  - Goods produced domestically and sold abroad

Example: benefits of trade

Country	Corn (Bushels per hour of labor)	Jeans (Pairs per hour of labor)
Euphoria	4	16
Contente	6	12

They each have 4 million labor hours available per week that they can use to produce corn, jeans, or a combination of both.

Contente

Corn: 1M hrs labor => 6M corn
Jeans: 3M hrs labor => 36M jeans

Euphoria

Corn: 3M hrs labor => 12M corn
Jeans: 1M hrs labor => 16M jeans

Example: benefits of trade

Country	Corn (Bushels per hour of labor)	Jeans (Pairs per hour of labor)
Euphoria	4	16
Contente	6	12

Contente's opportunity cost

Corn: 12/6 = 2
Jeans: 6/12 = 1/2

Euphoria's opportunity cost

Corn: 16/4 = 4
Jeans: 4/16 = 1/4

Example: benefits of trade

Country	Corn (Bushels per hour of labor)	Jeans (Pairs per hour of labor)
Euphoria	4	16
Contente	6	12

Contente's opportunity cost

Corn: 12/6 = 2 ⟸ **Comparative advantage in the production of corn**

Jeans: 6/12 = 1/2

Euphoria's opportunity cost

Corn: 16/4 = 4

Jeans: 4/16 = 1/4 ⟸ **Comparative advantage in the production of jeans**

Example: benefits of trade

Country	Corn (Bushels per hour of labor)	Jeans (Pairs per hour of labor)
Euphoria	4	16
Contente	6	12

Suppose that each country completely specializes in the production of the good in which it has a comparative advantage, producing **only** that good.

Contente's production under specialization:

Corn: 6*4 = **24**
Jeans: 12*0 = 0

Euphoria's production under specialization:

Corn: 4*0 = 0
Jeans: 16*4 = **64**

Example: benefits of trade

Suppose the country that produces corn trades **14 million bushels of corn** to the other country in exchange for **42 million pairs of jeans**.

	Euphoria		Contente	
	Corn (*Millions of bushels*)	Jeans (*Millions of pairs*)	Corn (*Millions of bushels*)	Jeans (*Millions of pairs*)
Without Trade				
Production	12	16	6	36
Consumption	12	16	6	36
With Trade				
Production	0	64	24	0
Trade action	Imports 14	Exports 42	Exports 14	Imports 42
Consumption	14	22	10	42
Gains from Trade				
Increase in Consumption	2	6	4	6

Countries **did not** specialize

Corn: 18 million bushels
Jeans: 52 million pairs

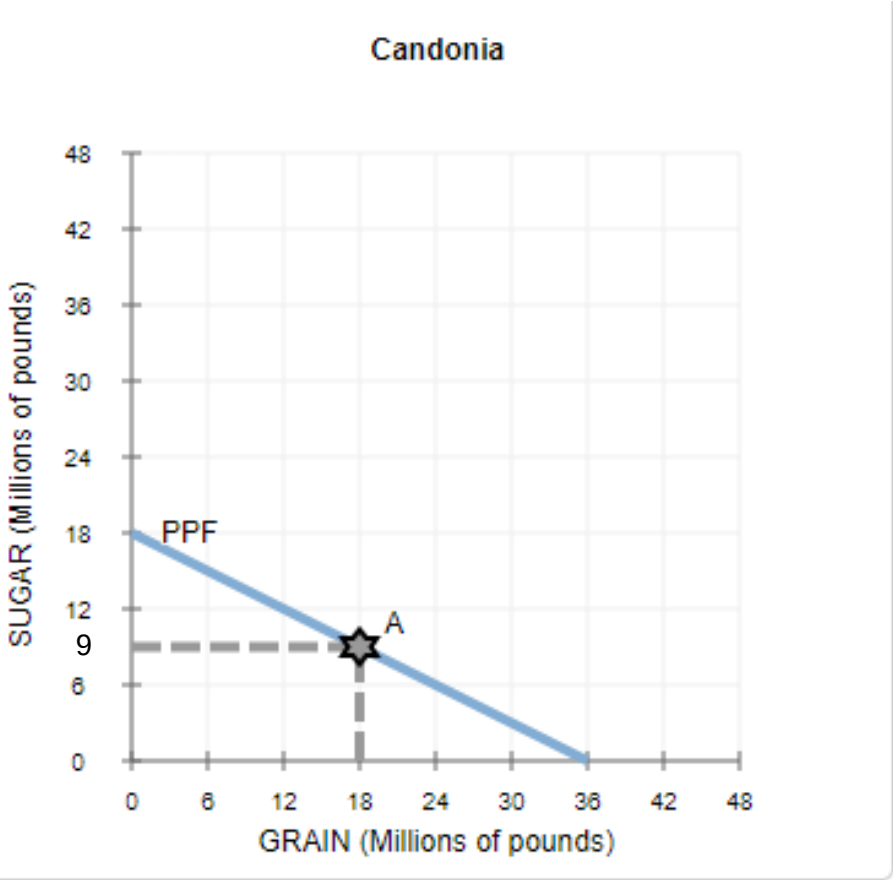
Countries **did** specialize

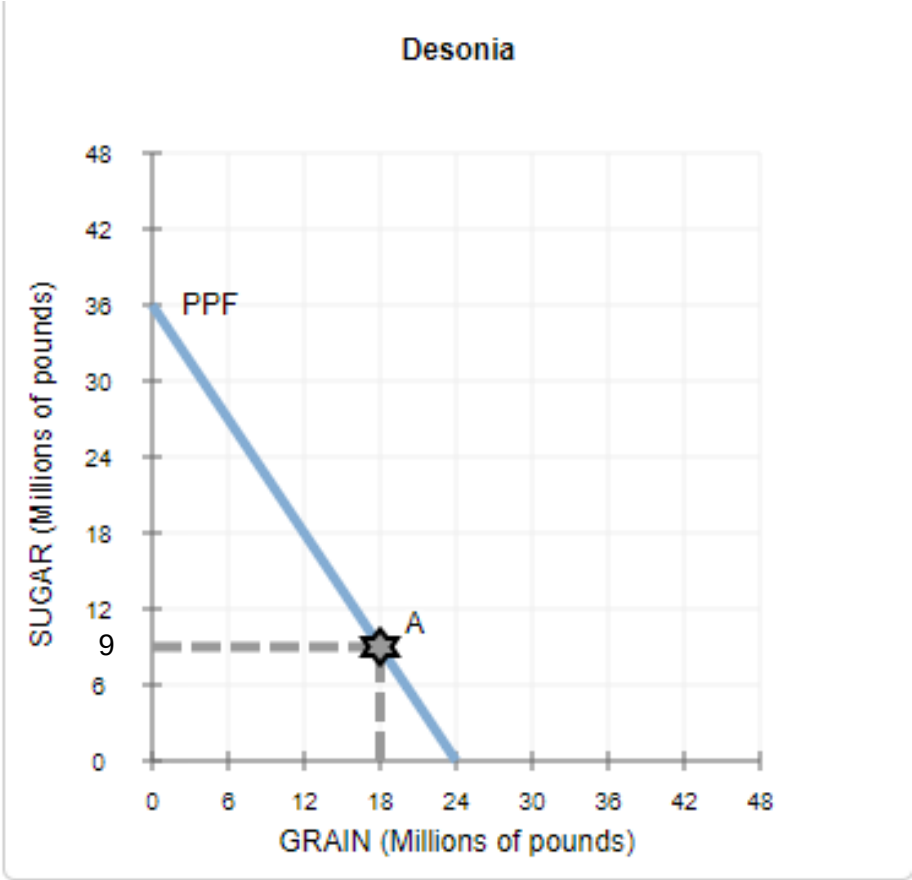
Corn: 24 million bushels
Jeans: 64 million pairs

Gains

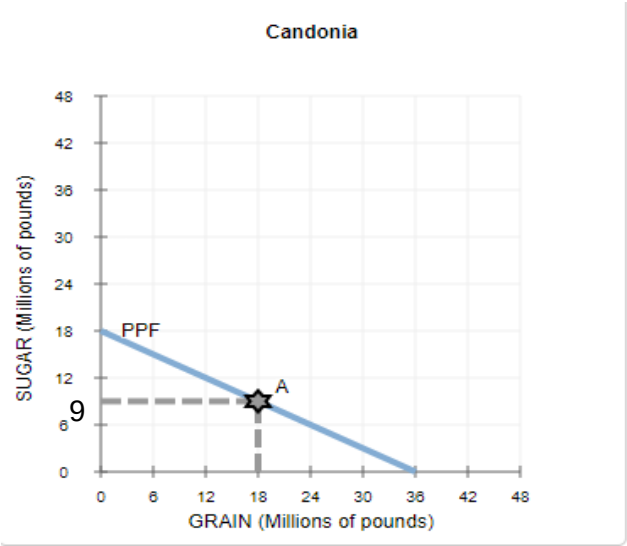
Corn: 6 M
Jeans: 12 M

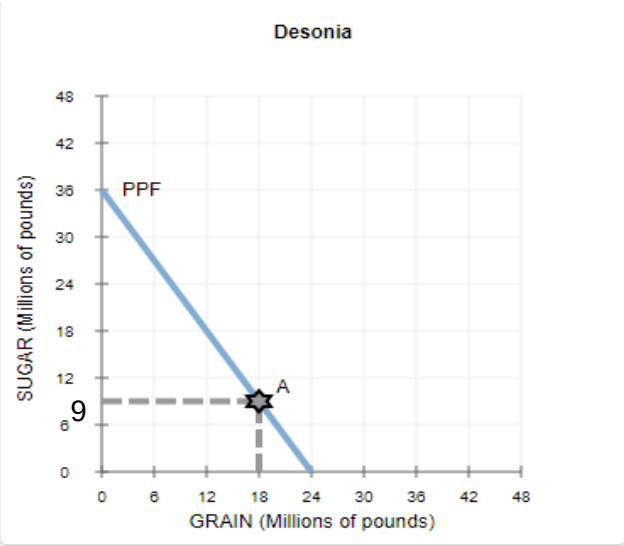
Example: Specialization and trade





Example: Specialization and trade





Candonia's opportunity cost

Sugar: 36/18 = 2
Grain: 18/36 = 1/2

Candonia's production under specialization:

Sugar : 0
Grain : **36**

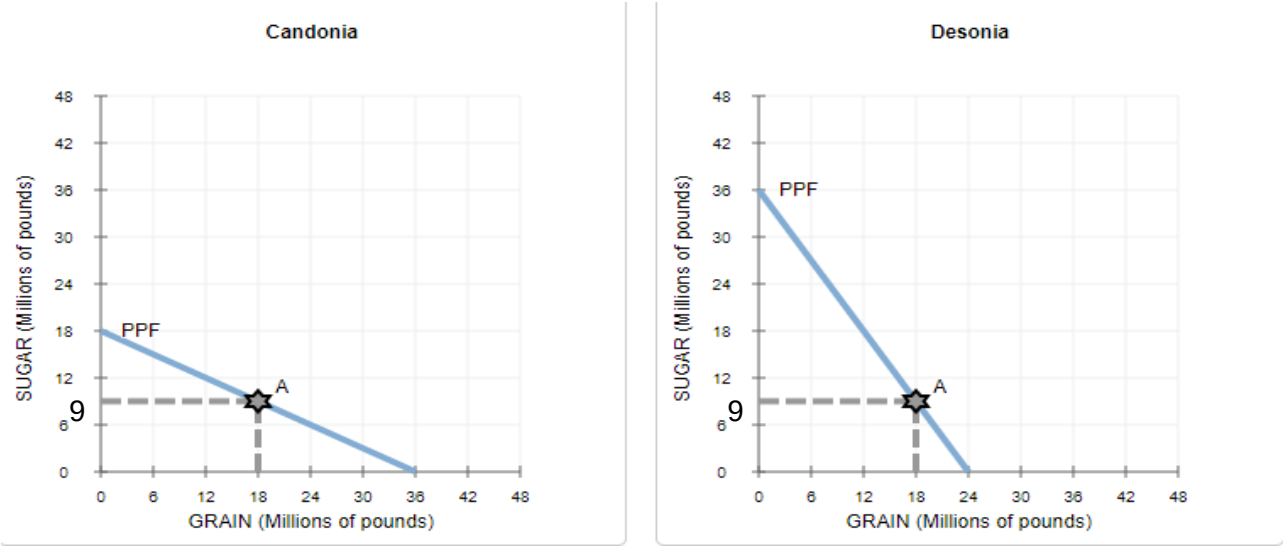
Desonia's opportunity cost

Sugar: 24/36 = 2/3
Grain: 36/24 = 3/2

Desonia's production under specialization:

Sugar : **36**
Grain : 0

Example: Specialization and trade



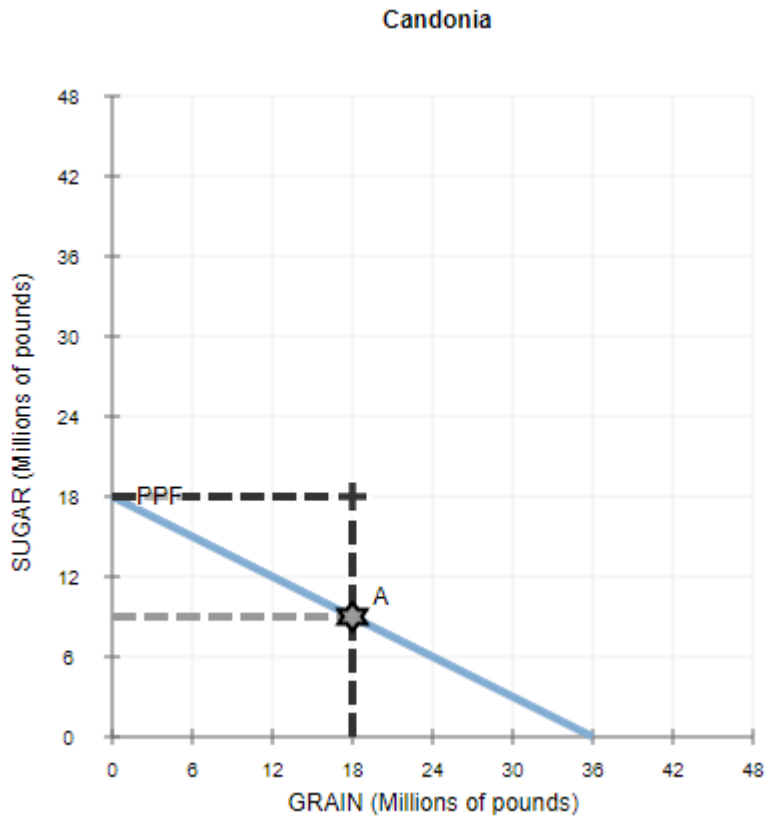
The countries decide to exchange 18 million pounds of grain for 18 million pounds of sugar.

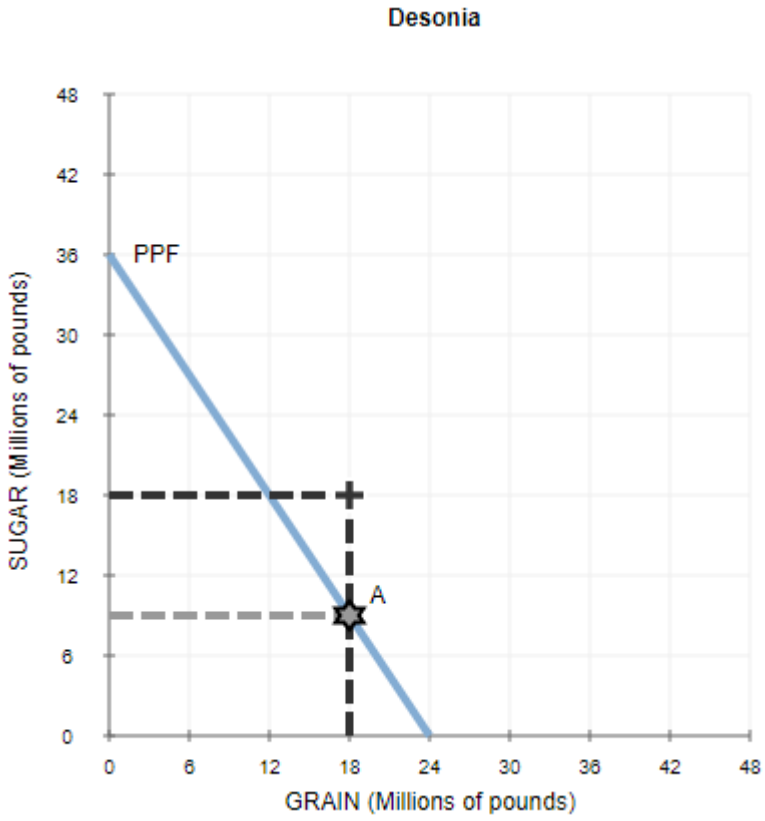
This ratio of goods is known as the **price of trade** between Candonia and Desonia.

Price of trade = 18/18 = 1

(1/2 > Price of trade > 3/2)
(2/3 > Price of trade > 2/1)

Example: Specialization and trade





Without engaging in international trade, Candonia and Desonia **would not** have been able to consume at the after-trade consumption bundles.