This presentation pertains to the textbook chapter listed below, but may not contain everything in the chapter.
It is not a replacement for reading the textbook and attending the lectures!

Chapter 3

Main topics:

Comparative Advantage and the Gains from Trade

Thank you for reporting errrors
and suggesting improvements!

In this lecture...

We will find out why people specialize and trade.

Comparative advantage
is the name of the economic theory that explains
how trade makes everyone better off,
and why impeding trade is not a good idea.

But first, let's review a few basic concepts...

Trade-off

You can’t have it all.

Getting something means giving up something else.

TRADE-OFF

But she can only marry one!

Opportunity Cost

What you give up to get something.

Explicit expenditures plus implicit value of the next-best alternative you had forego or do without.

OPPORTUNITY COST

Gains from trade

Instead of trying to make everything you need yourself,
you will be better off
specializing in what you're really good at doing,
and trade some of it
for things that other people
are better at making than you.


BEFORE
LOOK AT THIS ROOM. YOU ARE A PIG!!
YA — WELL YOU'RE A LOUSY COOK!
ECONOMIST
BIG MOMA AND LITTLE JOHNNIE SHOULD SPECIALIZE IN THE THINGS THEY ARE BEST AT AND TRADE
TO BECOME BETTER OFF
AFTER
OH WOW! NOW I CAN FIND MY CIGARETTES WHEN I NEED THEM!
OH WOW! MARIJUANA BROWNIES!

BEFORE

LOOK AT THIS ROOM. YOU ARE A PIG !!

YA — WELL YOU'RE A LOUSY COOK!

AFTER

OH WOW! NOW I CAN

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OH WOW!
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WHEN I NEED
THEM!

TO BECOME BETTER OFF

OH WOW! MARIJUANA BROWNIES!

BEFORE

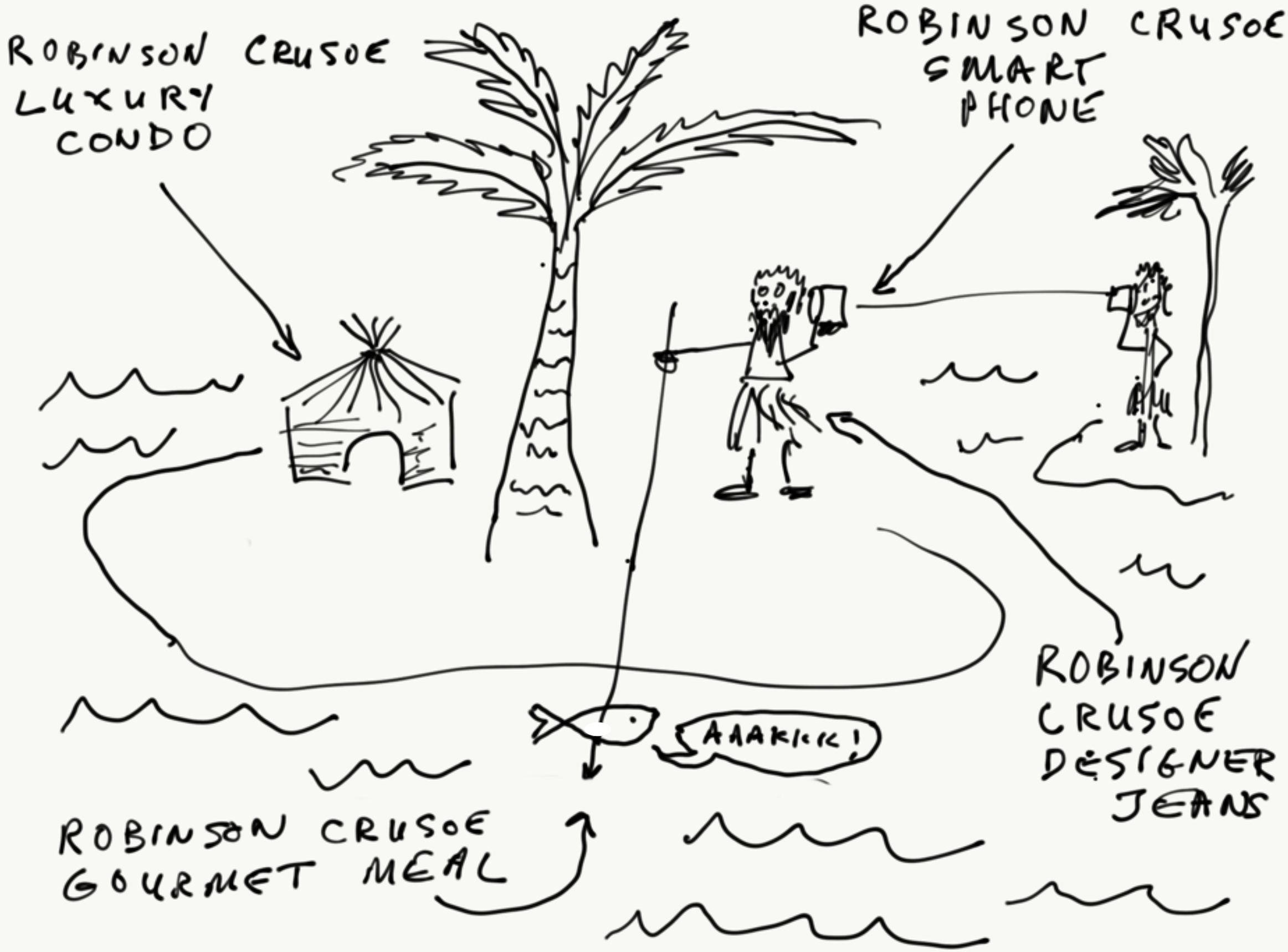
AFTER

Self-sufficiency keeps you down!

Imagine if you made all your own clothes,
grew all your own food, and built your own shelter
— all with components you harvested or made yourself.

You would be a MESS!

(No cool clothes, no iPhone, no lattes,
no music or video downloads
— that contribute to having a good life.)


ROBINSON CRUSOE LUXURY CONDO
ROBINSON CRUSOE SMART PHONE
AAAKIIIC!
ROBINSON CRUSOE DESIGNER JEANS
ROBINSON CRUSOE GOURMET MEAL

Specialize...

in the thing you are best at,
such as being an economist, engineer, or doctor
throughout your entire career.

...and trade.

Use the money you earn
to buy yourself all the cool things
that other people make fabulously well,
in order to have a really good life.

(By the way, all of us already do this.
We are all into free trade!)

How do I know what to specialize in?

You need to compare your opportunity costs with the opportunity costs of potential trading partners.

This is what we mean when we say
“specialize in the thing you are best at.”

How do I calculate my opportunity cost?

Opportunity cost is
"what you have to give up
to get a unit of something."

It is a ratio or rate:

<u>GIVE UP</u>
GET

How do I figure out how much I have to give up?

We need hard facts or data
about what you are capable of producing.

Then we need to do some calculations.

Your production possibilities

The data or facts about how much
of each good or service you could produce per period
or with a unit of productive resources
are known as your **production possibilities**.

This can be shown in a table
or on a graph.

Case Study

Each of the people in this story can produce meat and potatoes, and they want to eat a bit of both for supper.

They will realize that if they specialize and trade they can eat bigger meals!

he Production Opportunities

to :	Amount of Meat or Potatoes Produced in 8 Hours	
oes	Meat	Potatoes
n/kg	8 kg	32 kg
n/kg	24 kg	48 kg

FIGURE 3.1

The Production Possibilities Frontier

Panel (a) shows the production opportunities available to Frank the farmer and Rose the rancher. Panel (b) shows the combinations of meat and potatoes that Frank

(This example simplifies the world, with only two people and two products, so we can show it on two-dimensional graphs.)

Production Possibilities Data

A researcher would have to find these facts and report them to an economist in order to do the analysis that follows.

(a) The Production Opportunities

	Minutes Needed to Produce 1 kg of:		Amount of Meat or Potatoes Produced in 8 Hours	
	Meat	Potatoes	Meat	Potatoes
Frank	60 min/kg	15 min/kg	8 kg	32 kg
Rose	20 min/kg	10 min/kg	24 kg	48 kg

"PPF"

Production
Possibilities
Frontier

for
each person

(plots the data).

FIGURE 3.1

The Production Possibilities Frontier

Panel (a) shows the production opportunities available to Frank the farmer and Rose the rancher. Panel (b) shows the combinations of meat and potatoes that Frank can produce. Panel (c) shows the combinations of meat and potatoes that Rose can produce. Both production possibilities frontiers are derived assuming that Frank and Rose each work 8 hours a day. If there is no trade, each person's production possibilities frontier is also his or her consumption possibilities frontier.

(a) The Production Opportunities

	Minutes Needed to Produce 1 kg of:		Amount of Meat or Potatoes Produced in 8 Hours	
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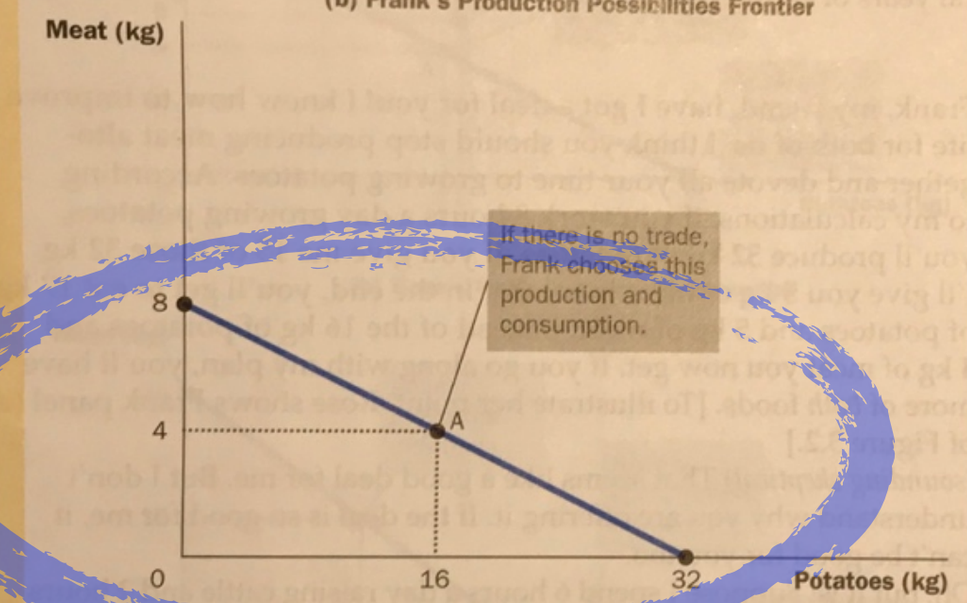

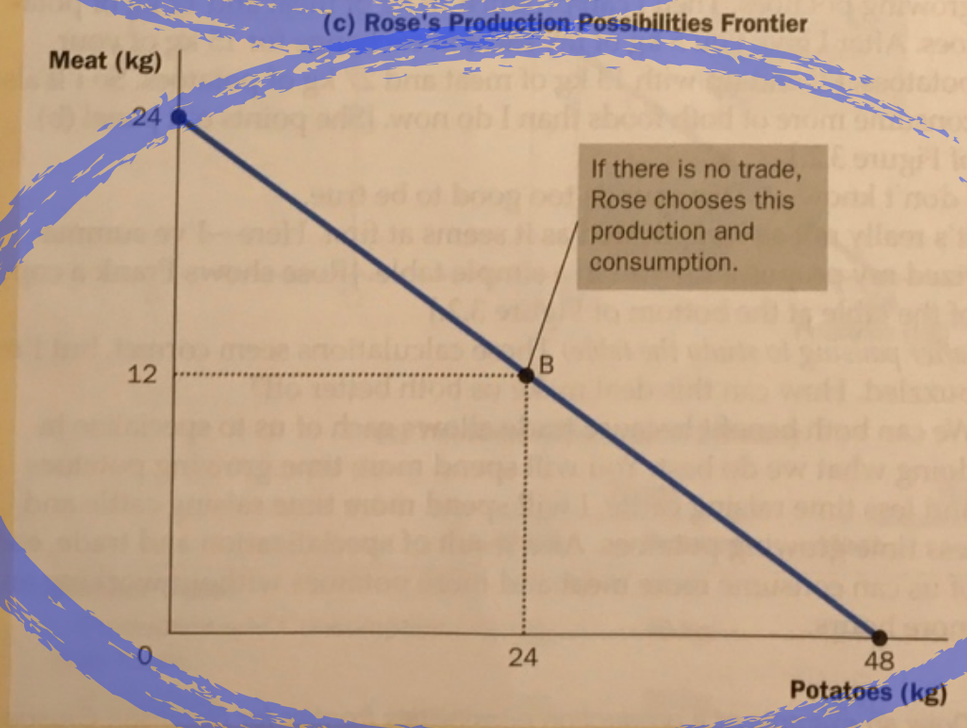

The intercepts of the PPF are the amount of each good that could be produced if all the person's resources were put into the production of only the good on each axis.

In other words, if they specialized totally in either good.

FIGURE 3.1

The Production Possibilities Frontier

Panel (a) shows the production opportunities available to Frank the farmer and Rose the rancher. Panel (b) shows the combinations of meat and potatoes that Frank can produce. Panel (c) shows the combinations of meat and potatoes that Rose can produce. Both production possibilities frontiers are derived assuming that Frank and Rose each work 8 hours a day. If there is no trade, each person's production possibilities frontier is also his or her consumption possibilities frontier.

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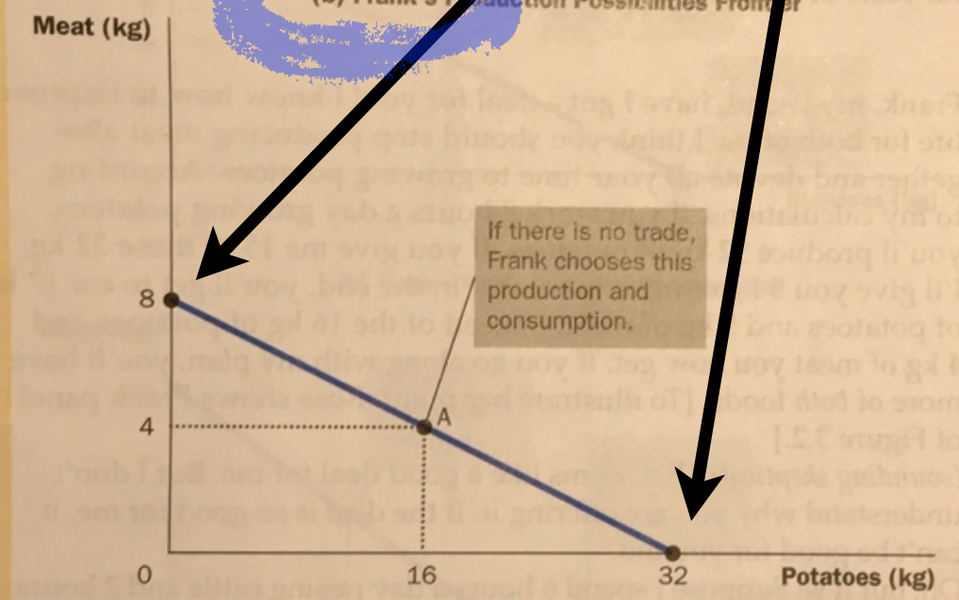
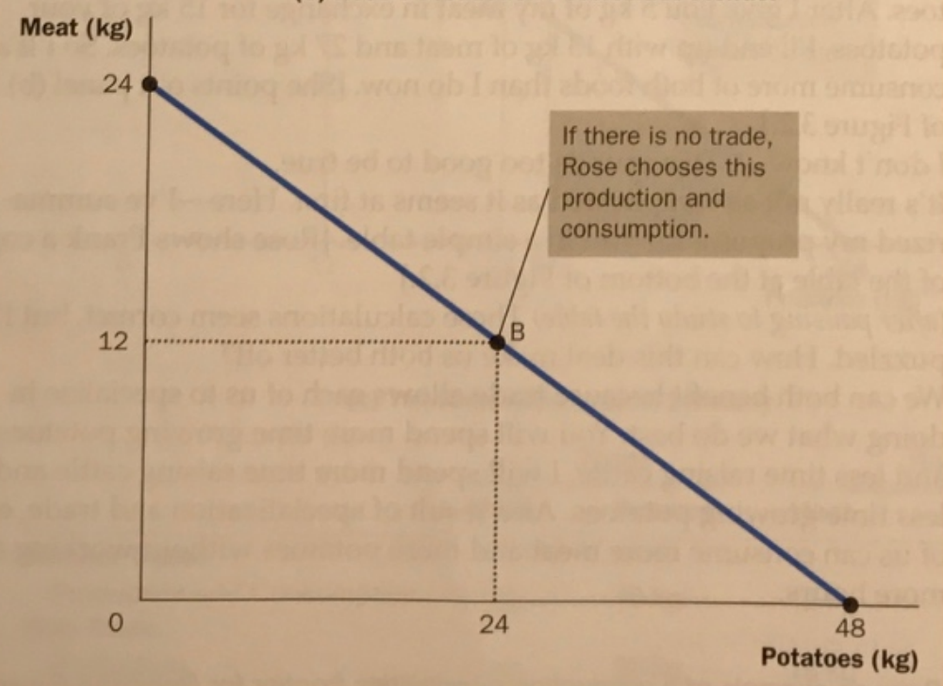
Rose	20 min/kg	10 min/kg	[illegible] kg	[illegible] kg

(b) Frank's Production Possibilities Frontier

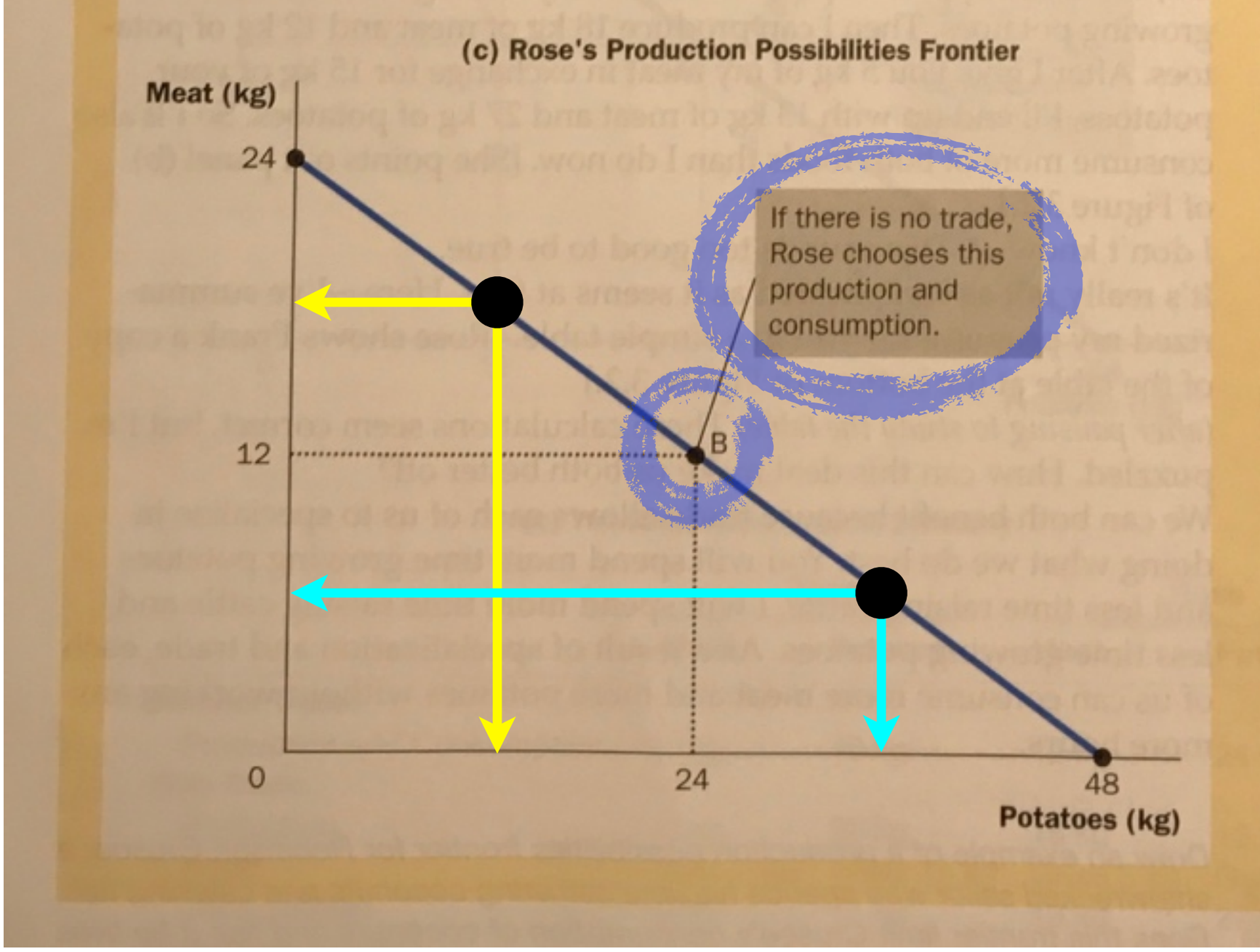


(c) Rose's Production Possibilities Frontier



But the person is not restricted to producing just one thing.

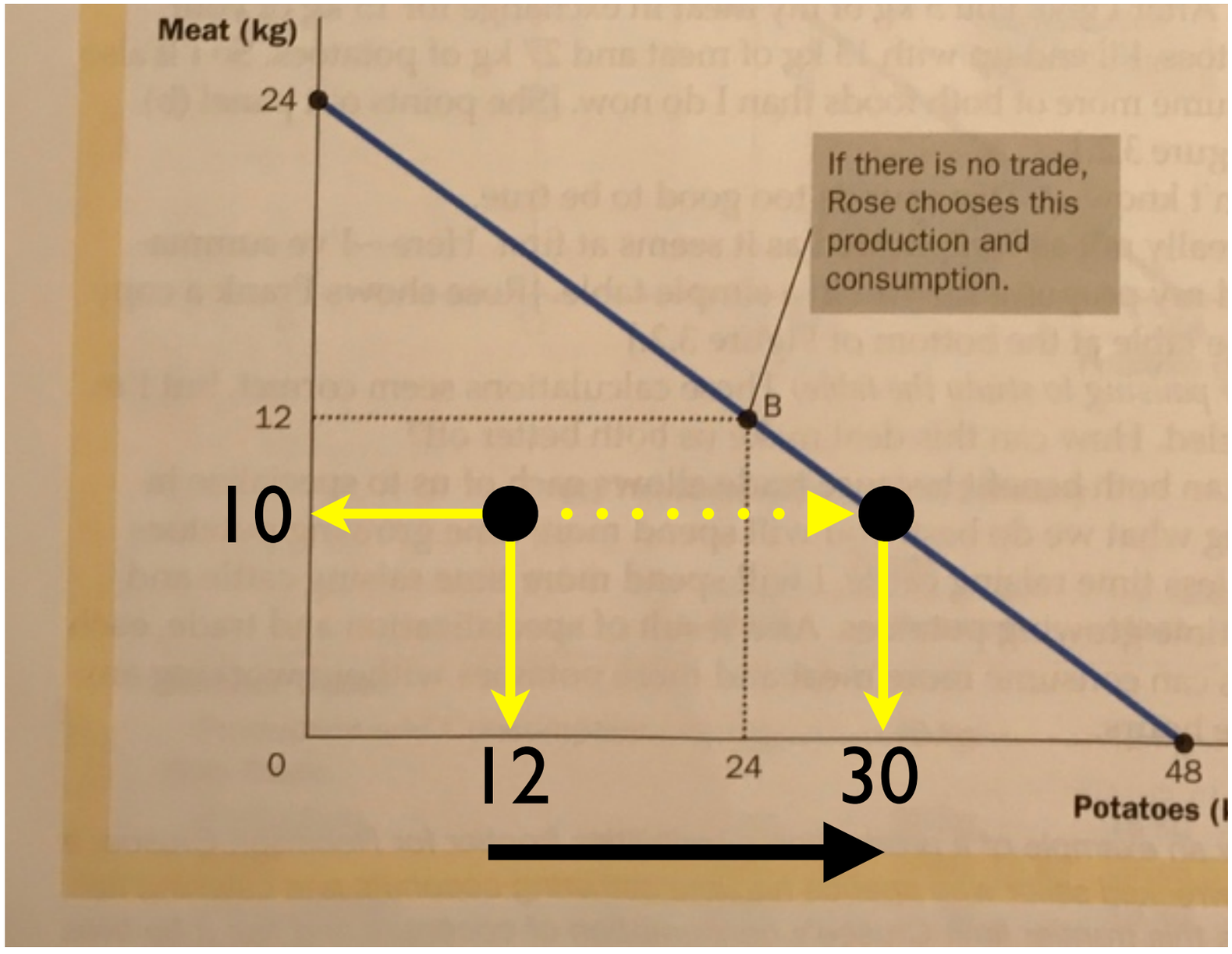
They have the resources and ability to produce any combination represented by points on the line joining the intercepts.



A person would choose to produce whichever combination they feel would make them best off.

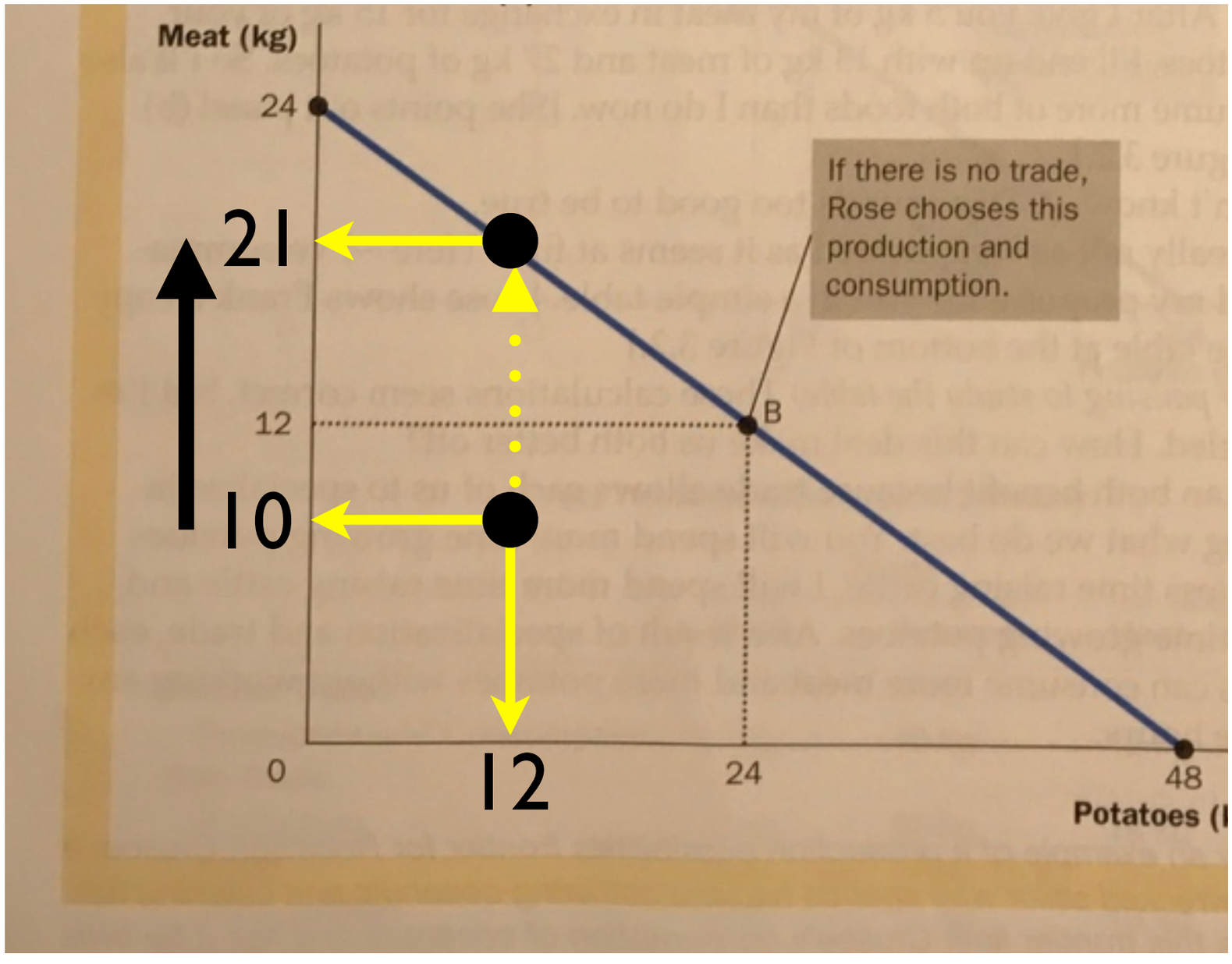
Inefficient combinations

As well as points <u>on</u> the PPF, combinations of goods represented by points <u>inside</u> the PPF can be produced, but they are inefficient — because the person is not using all their resources.



By putting <u>all</u> their resources to work, this person could keep the same quantity of meat (10) and get more potatoes (increase from 12 to 30)…

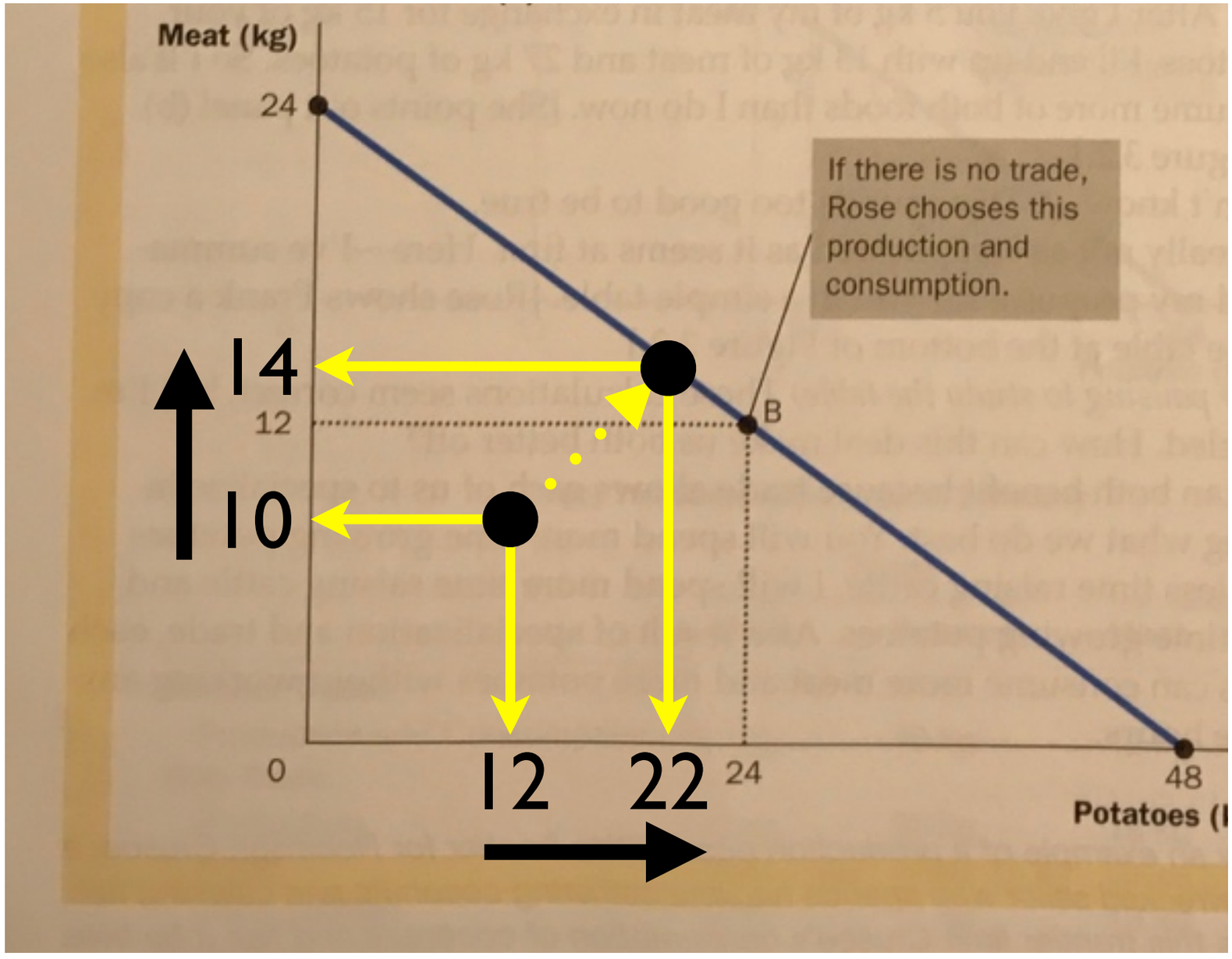
Inefficient combinations



By putting <u>all</u> their resources to work, this person could keep the same quantity of meat (10) and get more potatoes (increase from 12 to 30)…

or keep the same quantity of potatoes (12) and have more meat (increase from 10 to 21).

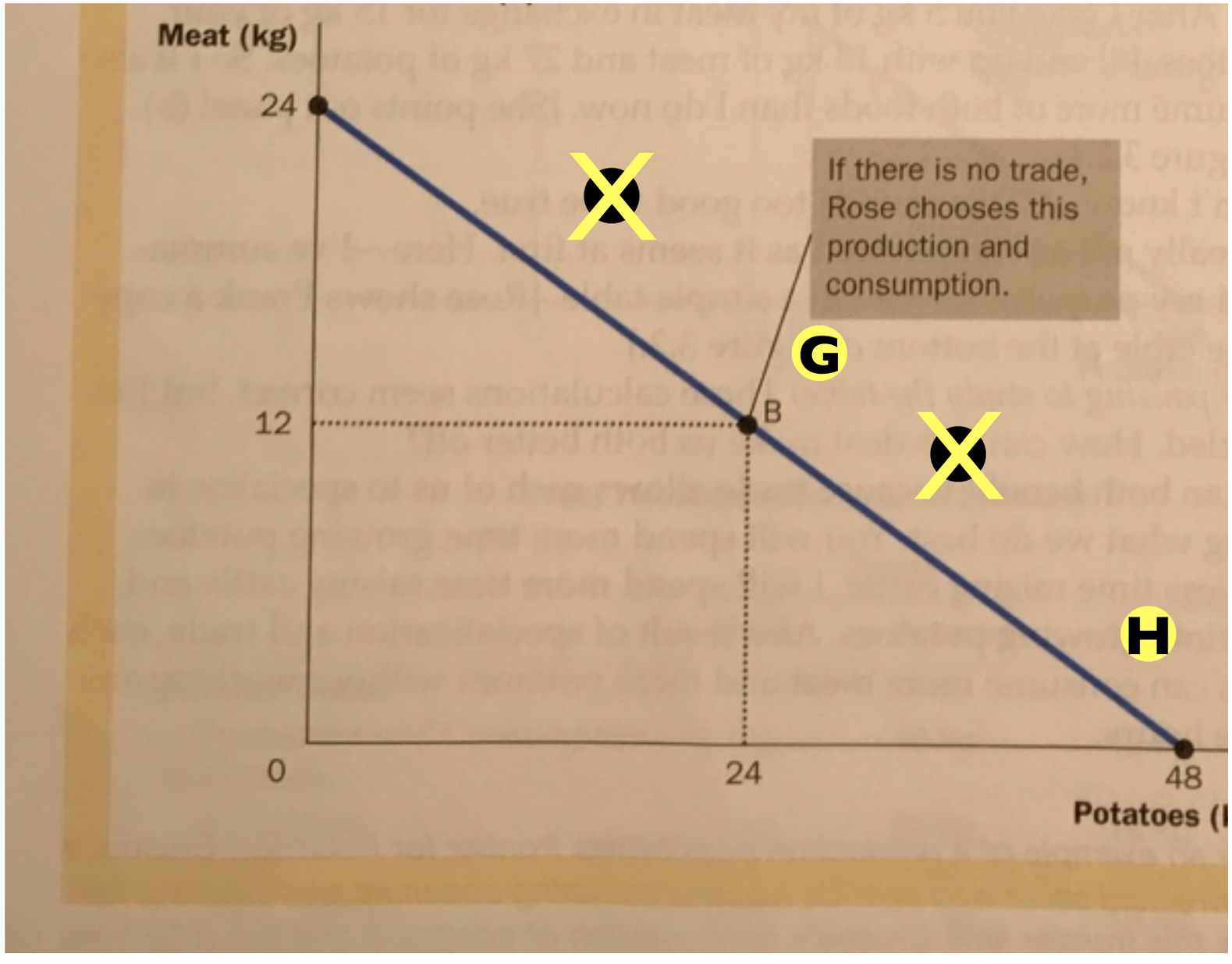
Inefficient combinations



…or have a bit more of both!

Unattainable combinations

This person does not have enough resources to produce any of the combinations that lie <u>beyond</u> the PPF.

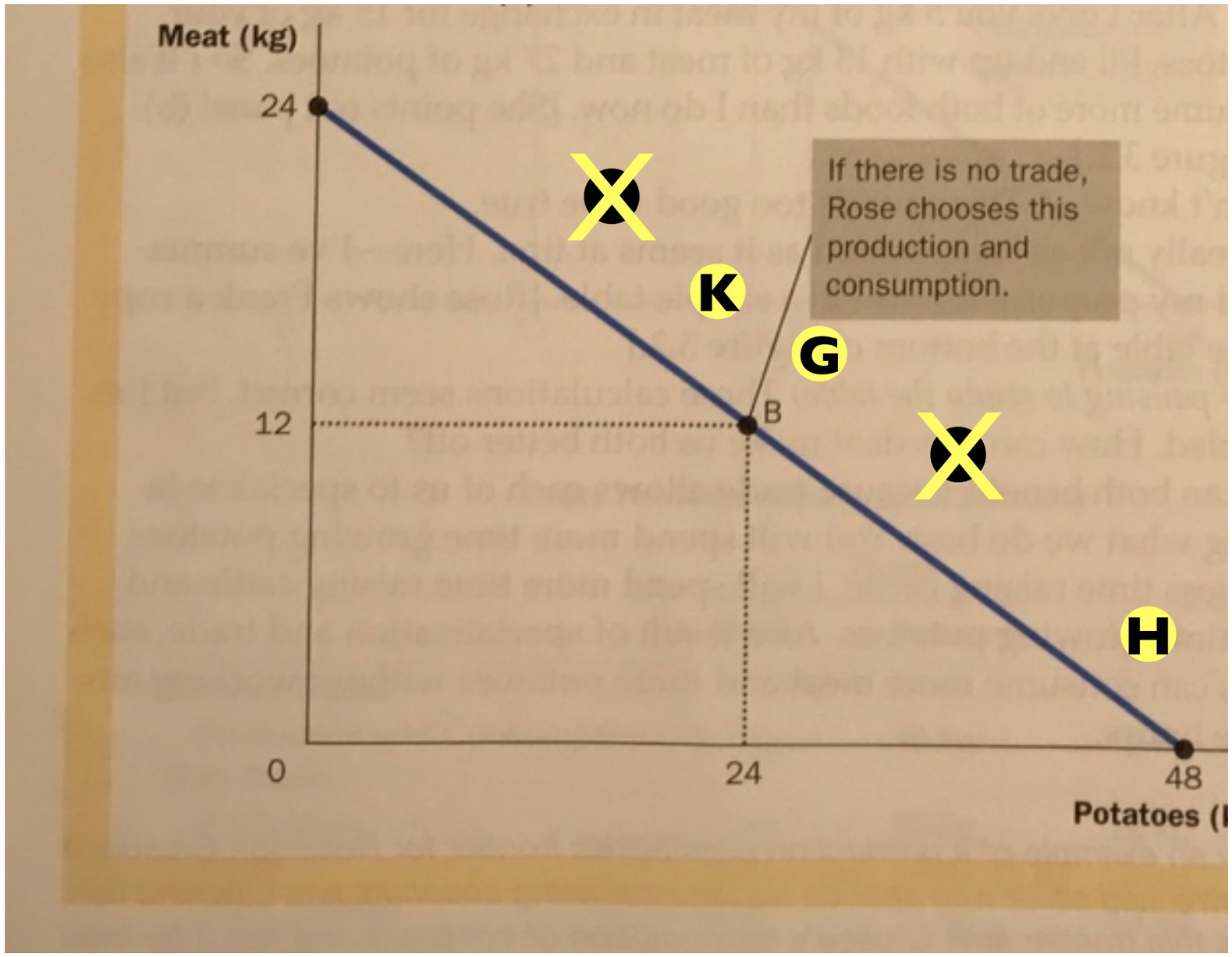


Not all combinations that lie <u>beyond</u> the PPF will make you better off.

For example, a point like G probably would make you better off because you would be getting a bigger meal.
But a point like H might make you worse off. You'd only have a little bit of meat and a mountain of potatoes!

Unattainable combinations

This person does not have enough resources to produce any of the combinations that lie <u>beyond</u> the PPF.



If you really like meat, a point like K would probably make you better off than G because you would have more meat (which you really like), and just a few fewer potatoes.

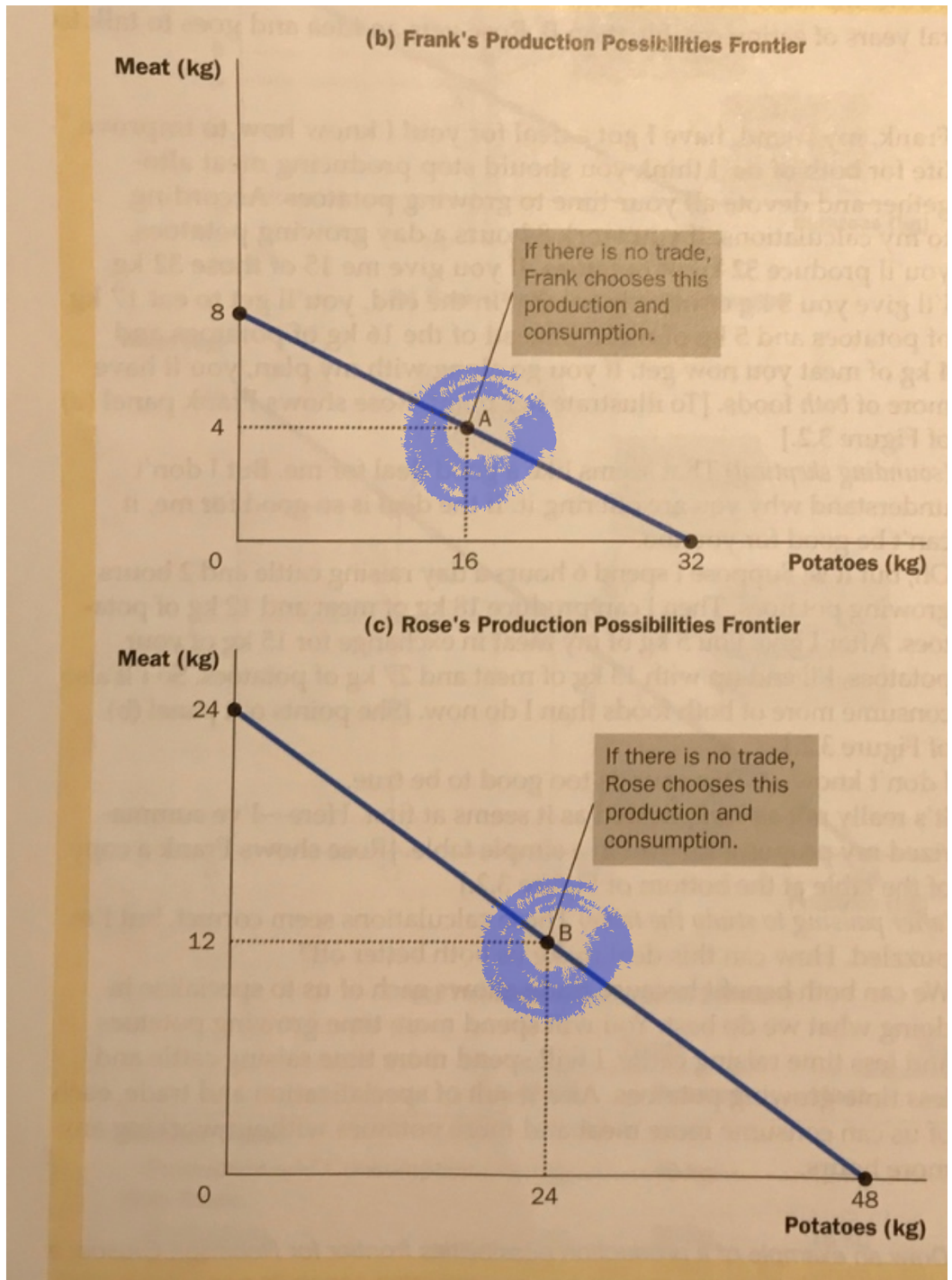
It depends on the person's preferences.

What are the points A and B?

These are the combinations of meat and potatoes that each person would choose if they had **no chance to trade*** and had to produce everything they want themselves.

*

Self-sufficient
In isolation
"Autarky"



We take this as a given — <u>they</u> decided what combination makes them feel best off.

It's like you deciding how much milk and sugar to put in your coffee to make it the way you like it.

It's up to you (only) to figure out your preferences and tastes.

What are the "gains from trade"?

The reason to trade is to get yourself a better combination of meat and potatoes — which you would not have had access to if you stayed self-sufficient.

In other words,
trade allows you to consume at a point *beyond* your PPF.

This makes you better off. This is your gain from trade.

Both trading partners become better off.
One does not gain at the expense of the other.

You do not necessarily have to end up with more of both products to be better off.
I would be better off if I had more steak even if I didn't get more potatoes!
But that would still be a combination outside my own PPF that I could only reach through trade.

Absolute advantage

Whoever can produce **more** of a product
in a particular period or with a unit of productive resources
has an **absolute advantage** in the production
of that product.

We could say that they have the
highest productivity.

But this does not settle the question of
who should produce what.

Who should produce what?

Each product should be produced by the person with the lowest opportunity cost.

Comparative advantage

Compare each person's opportunity cost
in producing a particular product.

Whoever has the lowest opportunity cost has a
comparative advantage
in the production of that product.

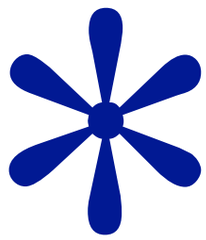
Steps to discover comparative advantages

1- List the data.

2 - Calculate the opportunity costs on a "per unit" basis.

3 - Identify the lowest opportunity cost for each product.

(Always*, one person will have the lowest opportunity cost for one product,
and the **other person** will have the lowest opportunity cost for the *other product*.)

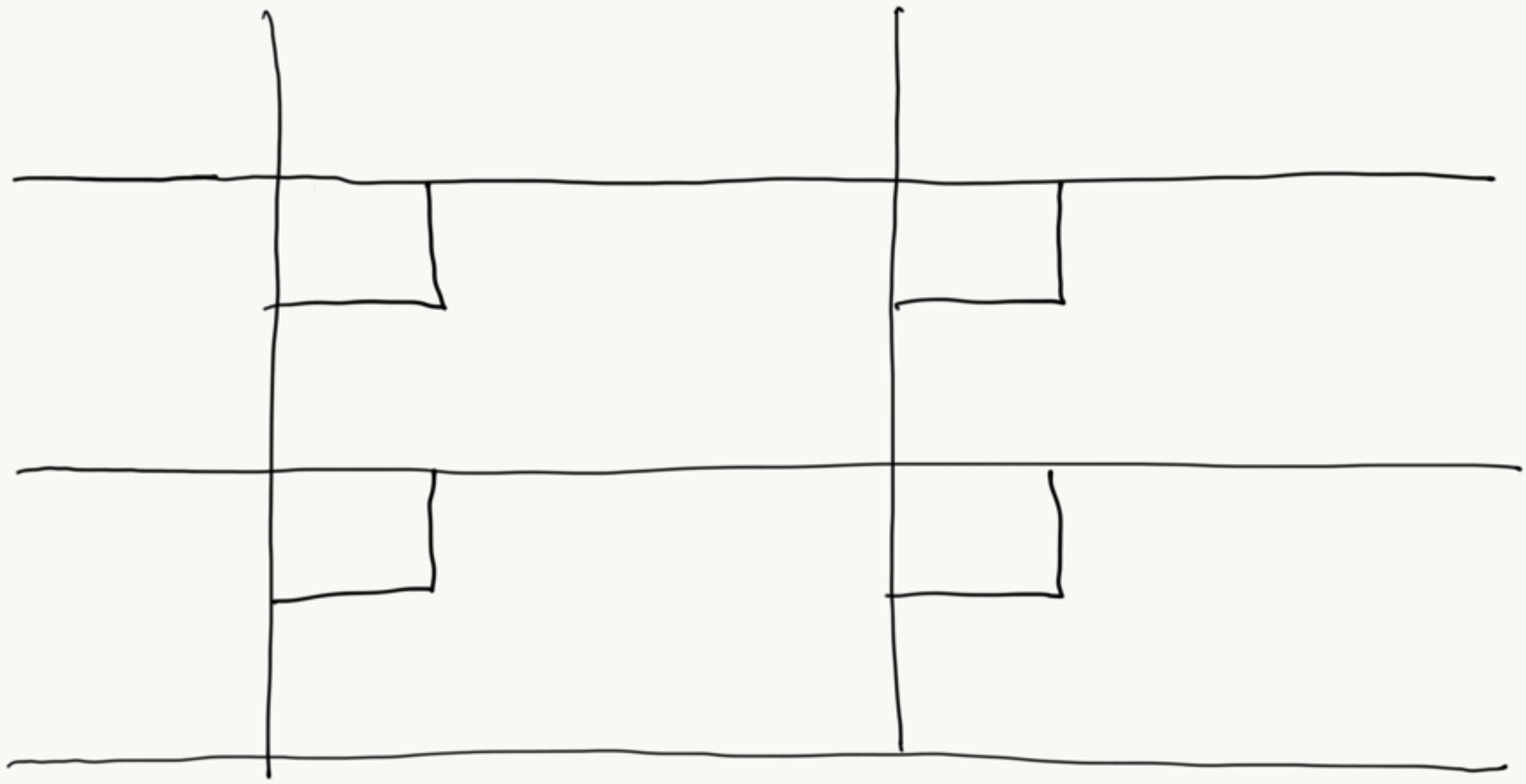


* ...unless the other person has exactly the same capabilities (production possibilities) as you.

This is extremely unlikely.

(But if it were the case, this would be the only time when there would be no gains from trade.)

To avoid mistakes, use this framework



NAME OF ONE PERSON

NAME OF OTHER PERSON

NAME OF ONE PRODUCT

NAME OF OTHER PRODUCT

PRODUCTIVITY DATA GOES IN THE SMALL BOXES

NAME OF ONE PERSON

NAME OF OTHER PERSON

NAME OF ONE PRODUCT

NAME OF OTHER PRODUCT

PRODUCTIVITY DATA GOES IN THE SMALL BOXES

OPPORTUNITY COST CALCULATIONS WILL GO IN BIG SPACES

Using data from the textbook (p.49) we fill out the grid:

IN ONE DAY THIS CAN BE PRODUCED BY →	ROSE	FRANK
MEAT OPP COST = GIVE UP / GET	24M GIVE UP / GET: 48P / 24M = 2P / 1M	8M GIVE UP / GET: 32P / 8M = 4P / 1M
POTATOES OPP COST = GIVE UP / GET	48P GIVE UP / GET: 24M / 48P = 0.5M / 1P	32P GIVE UP / GET: 8M / 32P = 0.25M / 1P

Circle the lowest opportunity cost for each product.

The person with the lowest opportunity cost should specialize in producing that product.

Then what?

Rose has the comparative advantage in meat,
so she should specialize in meat.

Frank has the comparative advantage in
potatoes, so he should specialize in potatoes.

Each person should consume some of what they produce
and trade away the rest
in exchange for some of the other product
which they want but are no longer producing.

The exchange rate for trade

There are two ways to get a product:
produce it yourself or
produce something else that you trade away to get it.

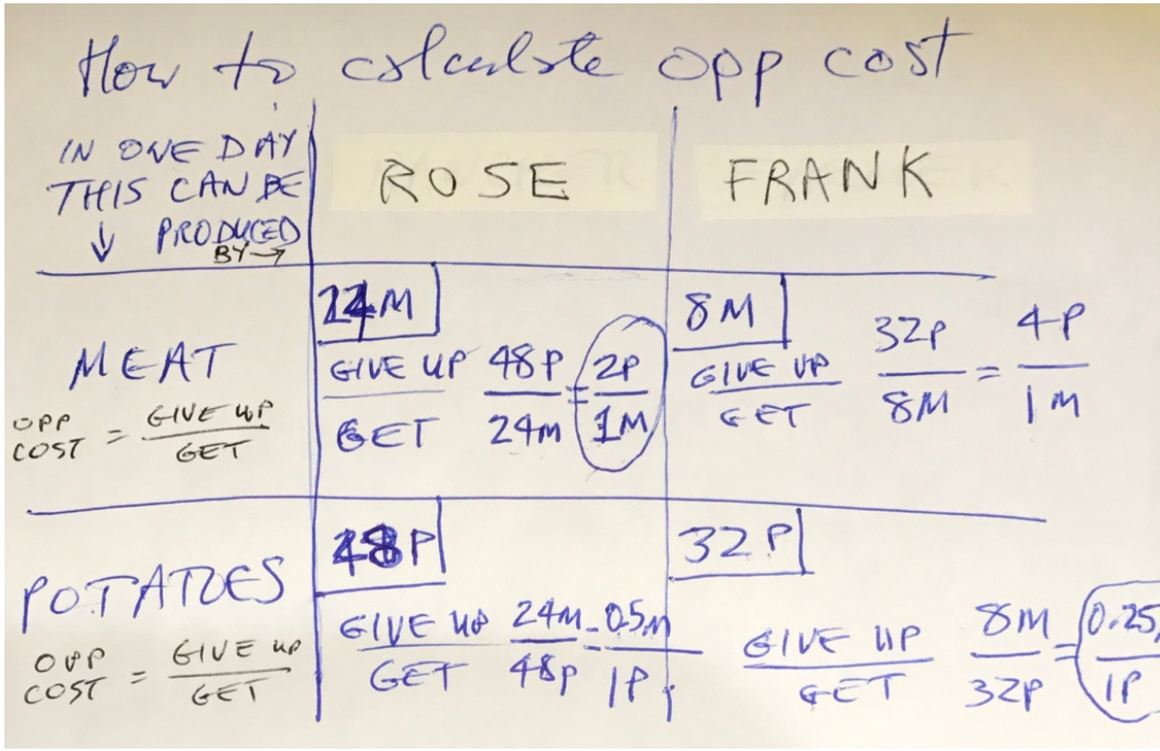
An exchange rate that is *between* the opportunity costs
of the potential trade partners
allows each person to obtain the other product more cheaply
than if they made everything him/herself.

When she is self-sufficient,
Rose has to forego
the production of **two** potatoes to
produce one unit of meat.

Rose would have an incentive
to trade if she could
get more than two potatoes for
a unit of meat that she produces.

Frank gives up **four** potatoes
to produce one unit of meat.

Frank would have an incentive
to trade if he could
give up fewer than four
potatoes to get a unit of meat.



An exchange rate for
trade that lies
between 2p and 4p
would allow each person
to have a better
opportunity cost
than when they are
self-sufficient.

For example:

3p for 1m.

You could also look at this from another angle

If **3p for 1m** is the exchange rate they agree upon, we can express it as a ratio:

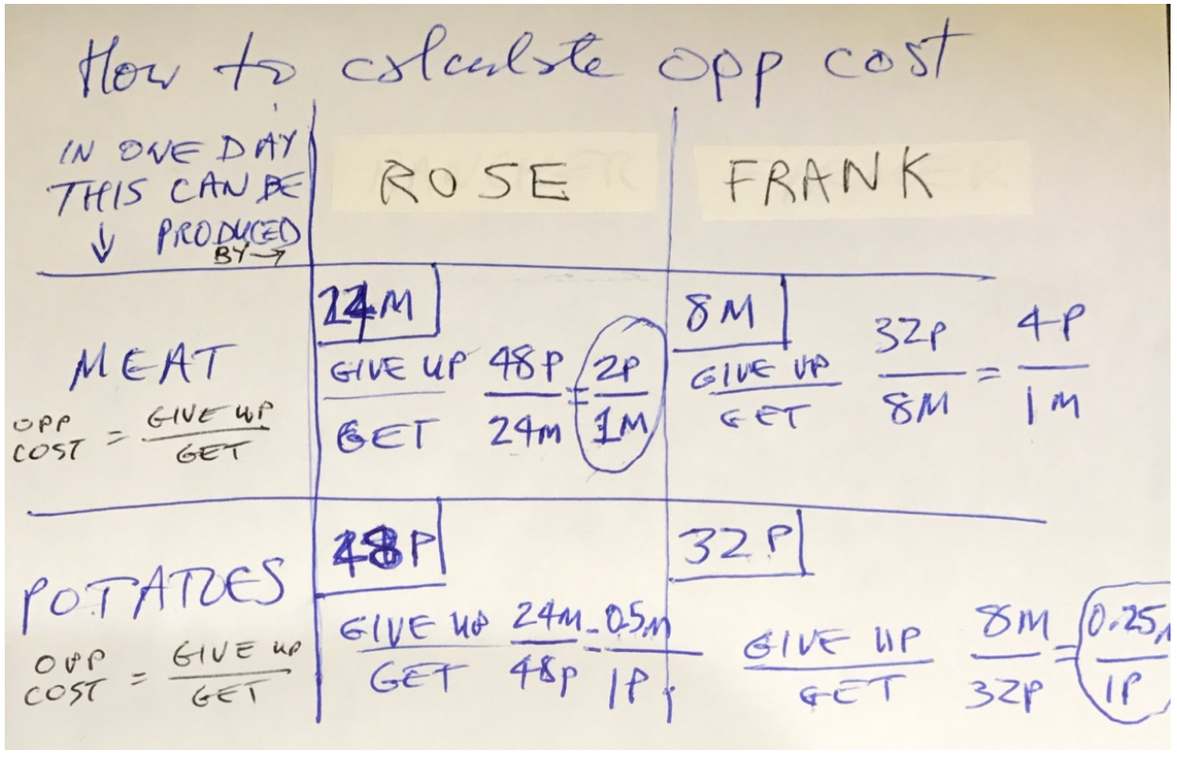
$$\frac{\text{GIVE UP } \mathbf{3 \text{ potatoes}}}{\text{GET } \mathbf{1 \text{ meat}}}$$

This is the "opportunity cost in trade" for a unit of meat.

To show the opportunity cost in trade of a unit of potatoes, take the reciprocal:

$$\frac{\text{GIVE UP } \mathbf{1 \text{ meat}}}{\text{GET } \mathbf{3 \text{ potatoes}}} = \frac{\text{GIVE UP } \mathbf{0.333 \text{ meat}}}{\text{GET } \mathbf{1 \text{ potato}}}$$

So...



Again,
looking at the opportunity costs:

Rose would have to give up **0.5 meat** to produce one potato.

Rose would trade if she could **give up less than 0.5 meat** that she produces in exchange for a unit of potatoes.

Frank would have to give up **0.25 meat** to produce one potato.

Frank would trade if he could **get more than 0.25** meat for one unit of potatoes that he produces.

<u>GIVE UP **0.333 meat**</u>
GET **1 potato**

For both Rose and Frank, this is a better opportunity cost than if they were self-sufficient.

However you look at it, both people are better off with trade

The "opportunity cost with trade" or the trading exchange rate is the same amount of potatoes exchanging for meat, whether you put meat or potatoes in the numerator or denominator.

GIVE UP **3 potatoes**
GET **1 meat**

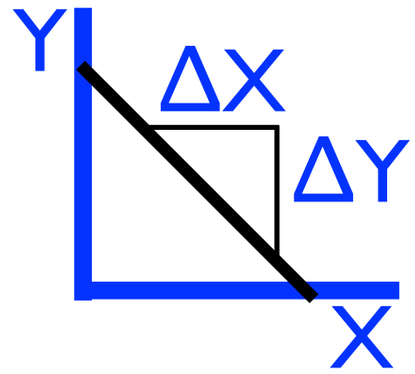
GIVE UP **1 meat**
GET **3 potatoes**

Each person can get more of the other good
if they specialize and trade
rather than producing the other good themselves.

Slope of PPF is opportunity cost

On a graph, the **slope** of a line is:

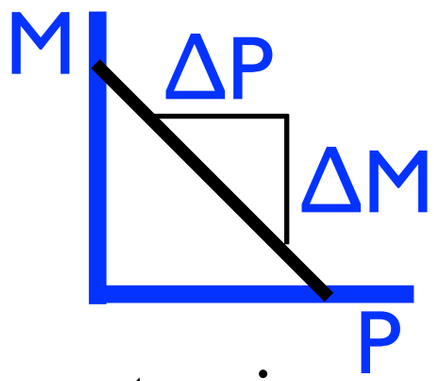
$$\frac{\text{RISE}}{\text{RUN}} \quad \text{or} \quad \frac{\Delta Y}{\Delta X}$$



The slope shows the rate at which Y decreases as you gain a unit of X.

If meat is on the vertical axis and potatoes are on the horizontal axis, then the slope is:

$$\frac{\Delta \text{MEAT}}{\Delta \text{POTATOES}}$$

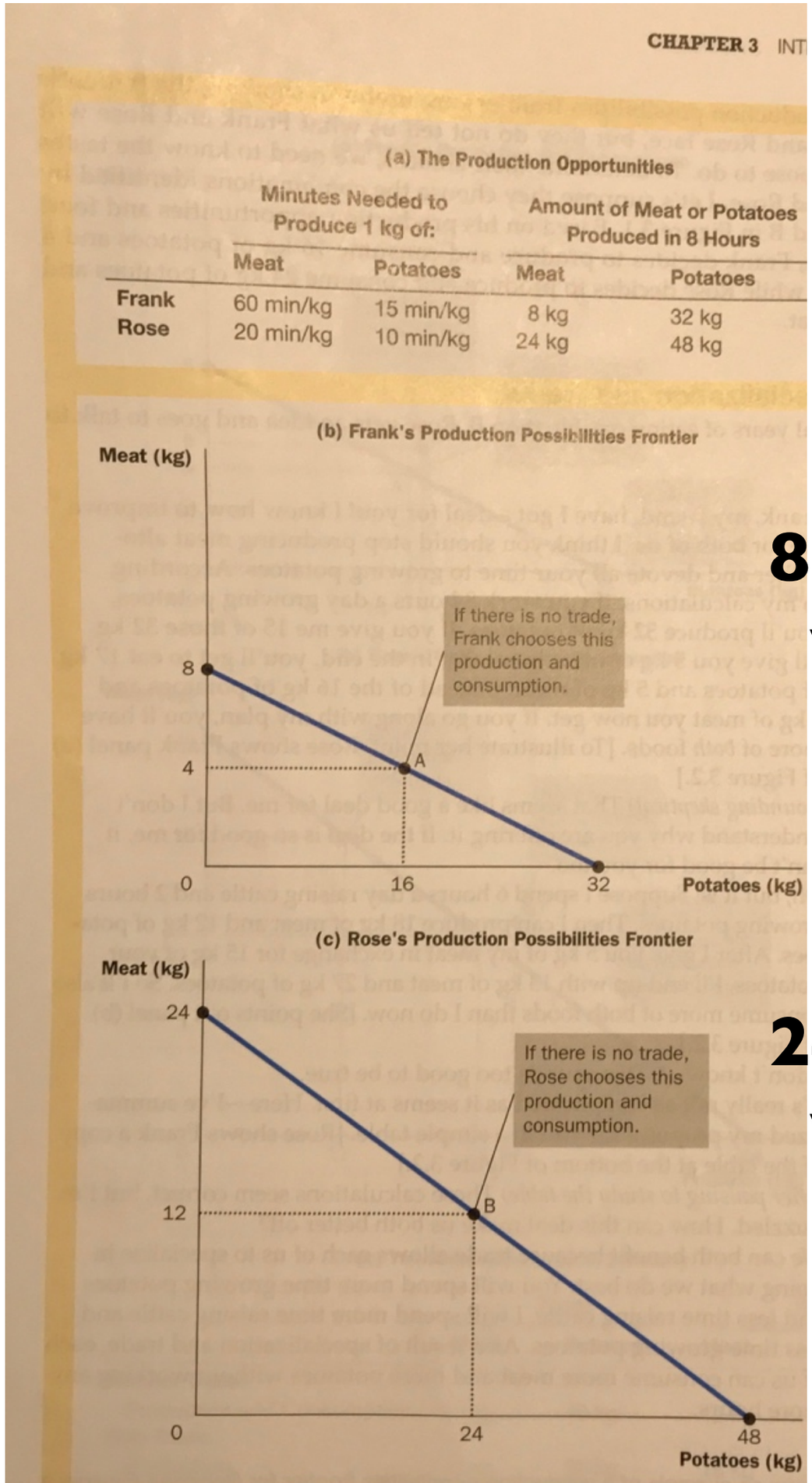


The slope shows the rate at which you would have to give up meat to get potatoes — which is the opportunity cost of getting a potato!

$$\text{Slope} = \frac{\Delta \text{MEAT}}{\Delta \text{POTATOES}}$$

= 8m / 32p for Frank

= 24m / 48p for Rose



CHAPTER 3 INT

(a) The Production Opportunities

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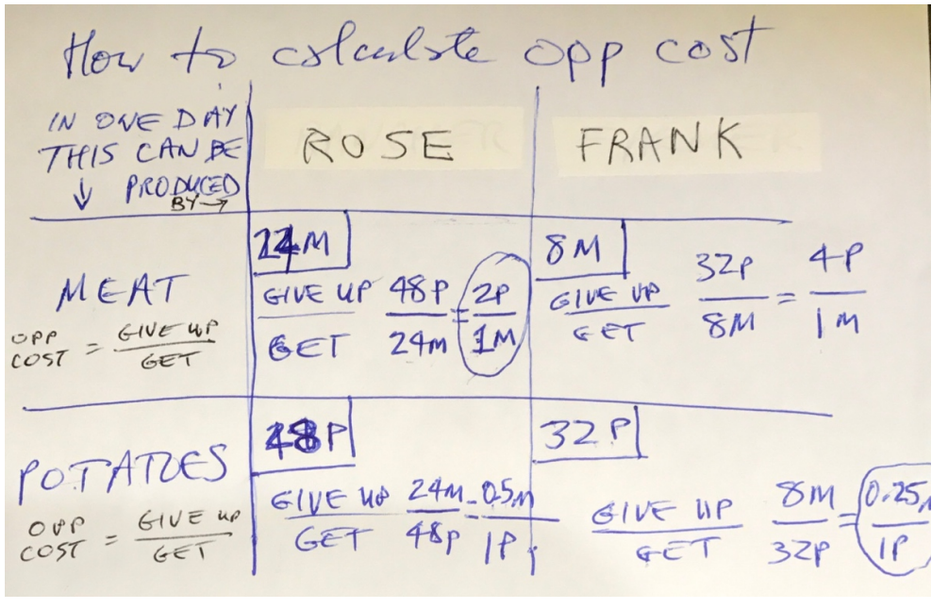
(b) Frank's Production Possibilities Frontier

(c) Rose's Production Possibilities Frontier



8m / 32p = 0.25m / 1p
which is exactly what we calculated for Frank's opportunity cost of potatoes.

24m / 48p = 0.5m / 1p
which is exactly what we calculated for Rose's opportunity cost of potatoes.

Remember our calculations:

IN ONE DAY THIS CAN BE PRODUCED BY →	ROSE	FRANK
MEAT OPP COST = GIVE UP / GET	24M GIVE UP / GET = 48P / 24M = 2P / 1M	8M GIVE UP / GET = 32P / 8M = 4P / 1M
POTATOES OPP COST = GIVE UP / GET	48P GIVE UP / GET = 24M / 48P = 0.5M / 1P	32P GIVE UP / GET = 8M / 32P = 0.25M / 1P

24m / 48p = 0.5m / 1p **8m / 32p = 0.25m / 1p**

Notice: Right now we are looking at each person's opportunity cost for potatoes, *not* which person has the lowest opportunity cost for each good.

Opportunity cost is CONSTANT for individuals.

Unlike the concave PPF of a country,
the PPF of a **person** is a **straight line** with a constant slope,
which reflects constant opportunity costs.

This is because a person
will have the same ability to produce one more unit of a product
regardless if they are producing just a little or a lot of it.

(When a **country** wants to produce more of something,
it must transfer resources that are less and less productive
in the alternative field, so the opportunity cost rises
and gives a country's PPF a curved, **concave shape**.
More on this later.)

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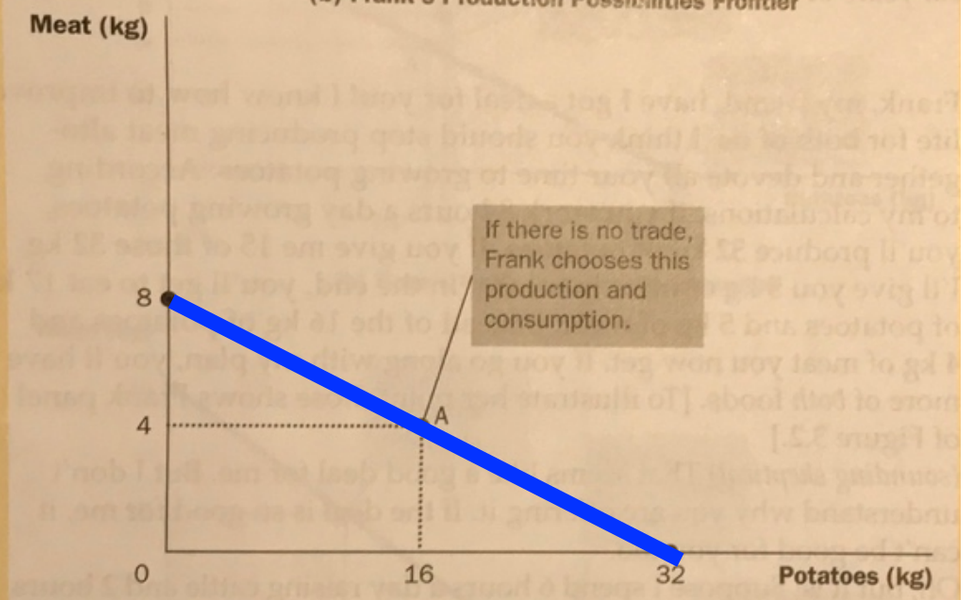
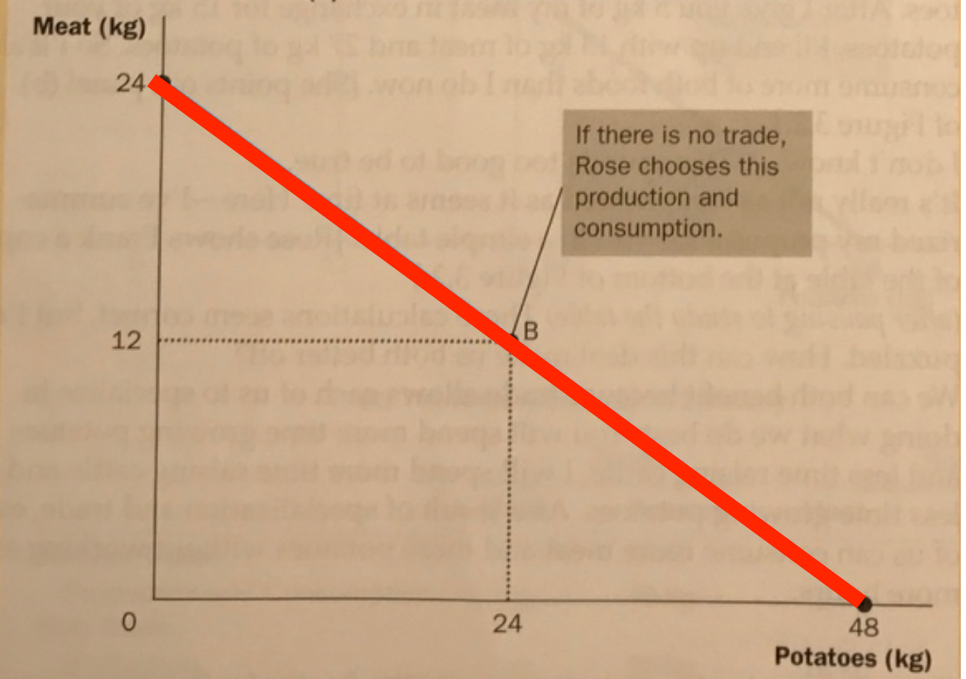


(c) Rose's Production Possibilities Frontier

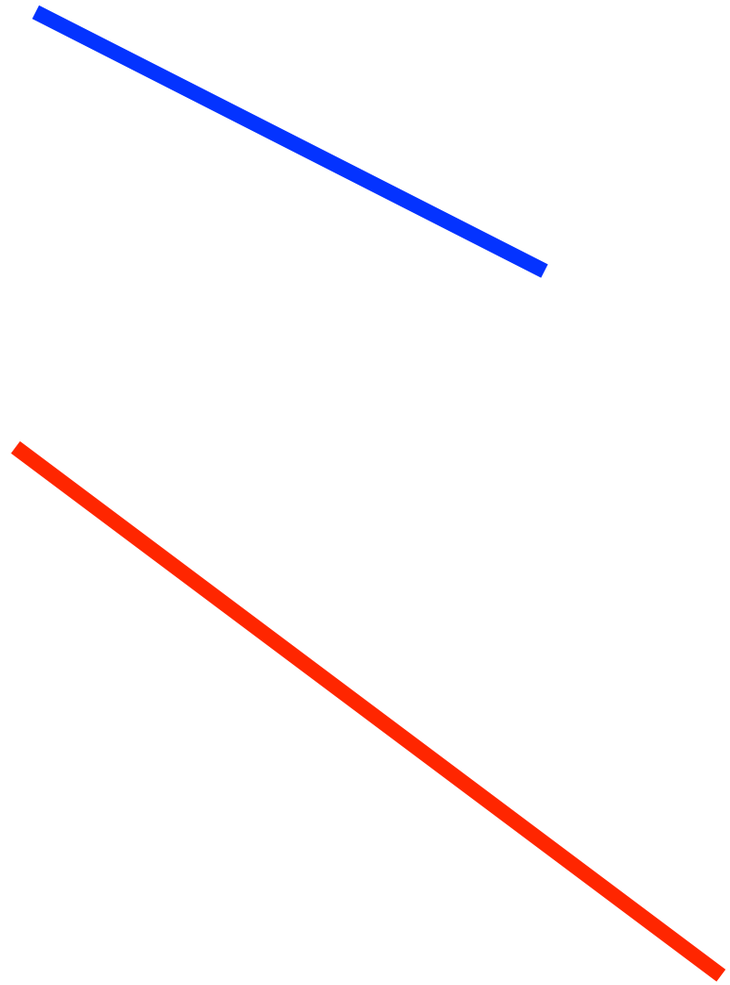


Slopes of the PPFs indicate opportunity cost ratios

8m / 32p = 0.25m / 1p
for Frank

24m / 48p = 0.5m / 1p
for Rose

Slopes of the PPFs indicate opportunity cost ratios



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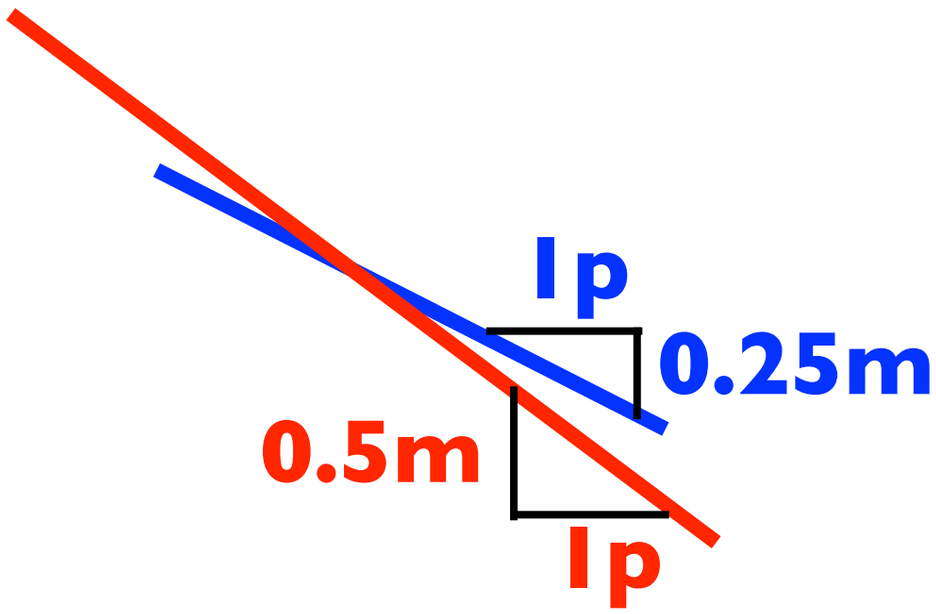
Slopes of the PPFs indicate opportunity cost ratios



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for Rose

Slopes of the PPFs indicate opportunity cost ratios

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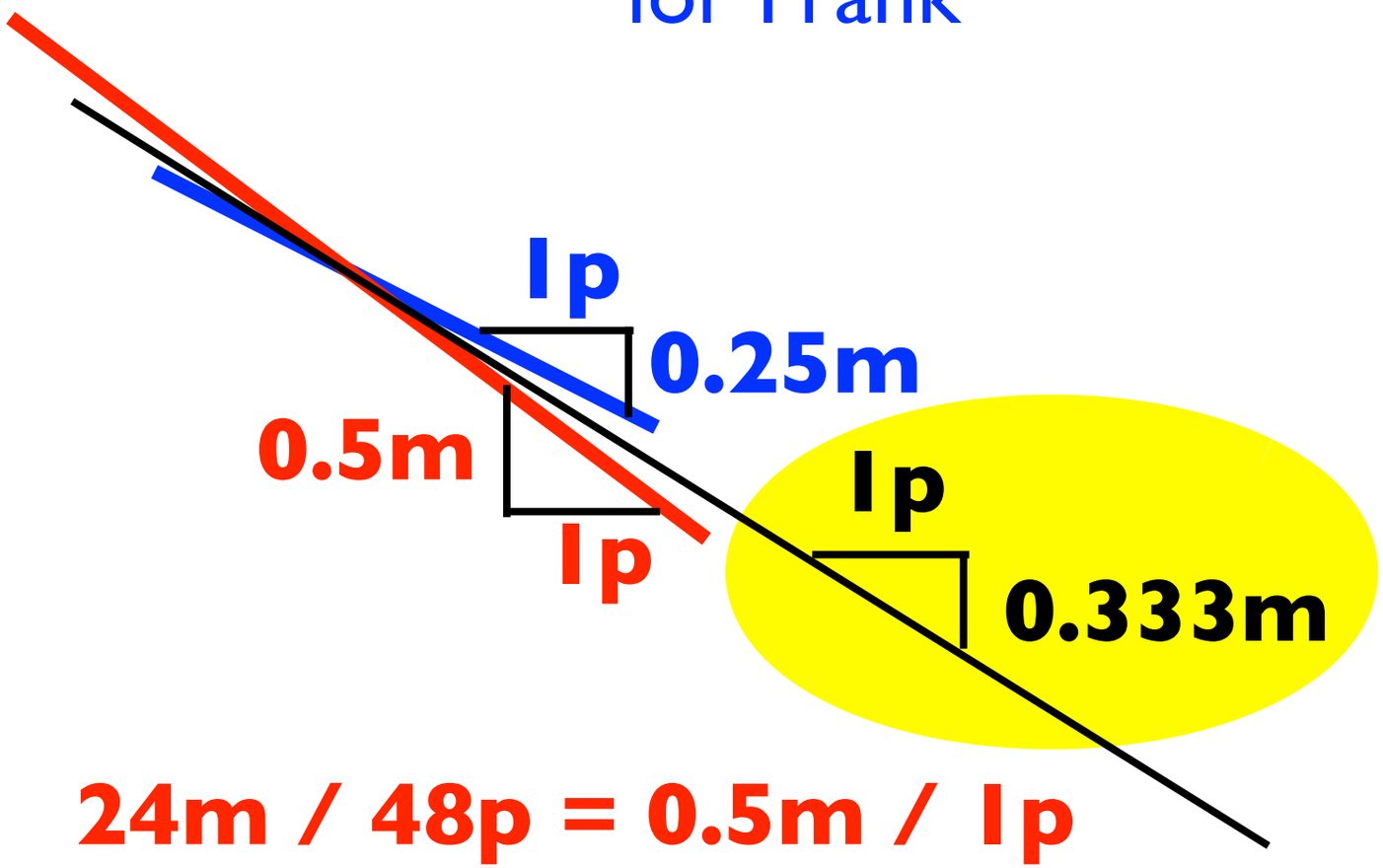
for Frank



24m / 48p = 0.5m / 1p
for Rose

A trading exchange rate acceptable to both Frank and Rose will lie between the slopes of their PPFs.
It will be between their opportunity costs.

's Production and Consumption

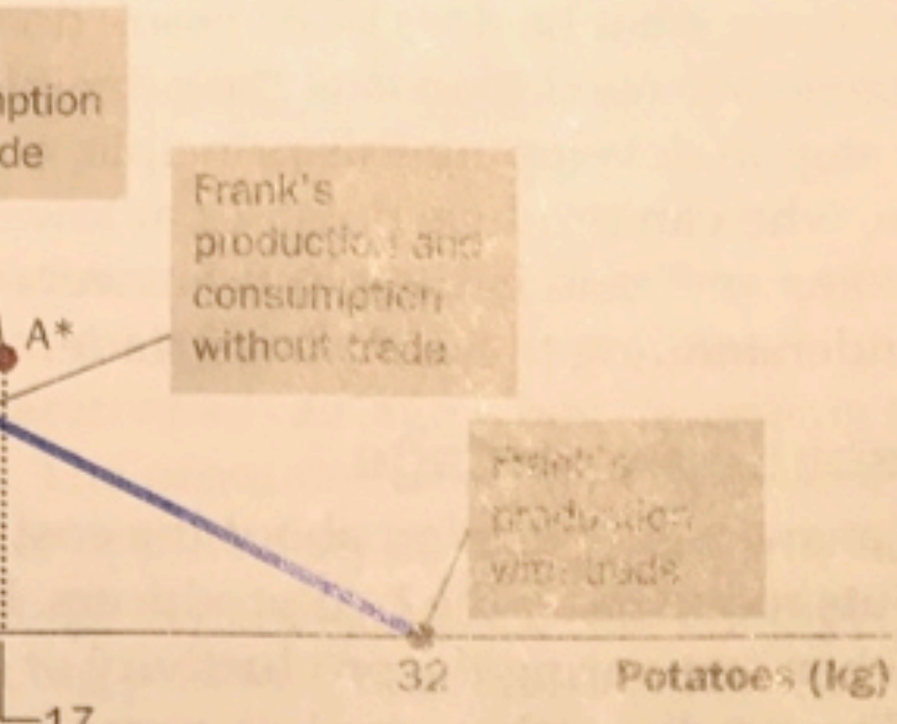


FIGURE 3.2

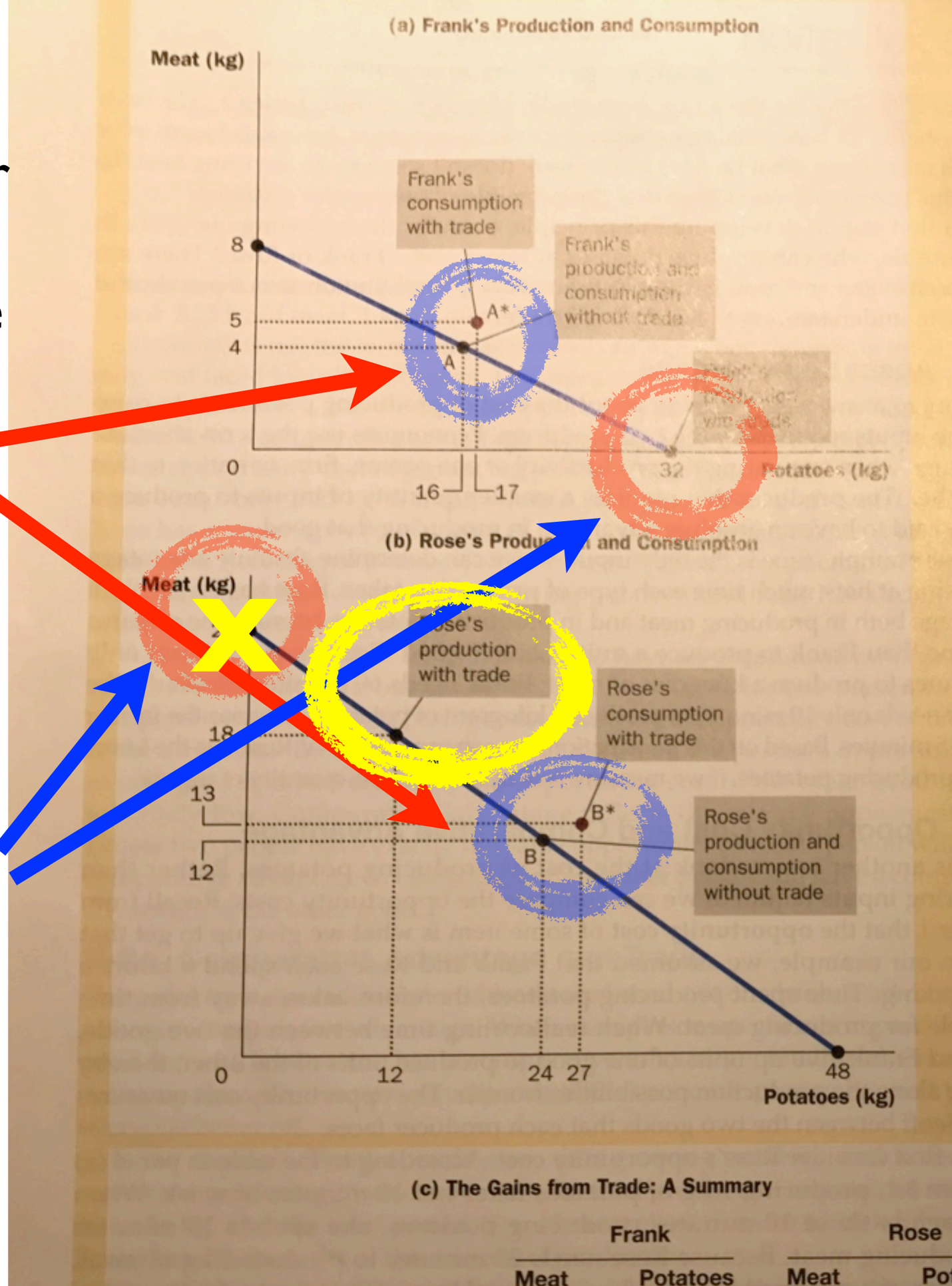
How Trade Expands the Set of Consumption Opportunities

The proposed trade between Frank the farmer and Rose the rancher offers each of them a combination of meat and potatoes that would be impossible in the absence of trade. In panel (a), Frank gets to consume at point A* rather than point A. In panel (b), Rose gets to consume at point B* rather than point B. Trade allows each to consume more meat and more potatoes.

After trade,
both people end up
being able to consume a better combination of meat and potatoes that was unattainable when they were self-sufficient.
Points A* and B* rather than A and B

Note:
Usually, individuals **specialize completely** in the production of the product in which they have a comparative advantage. But the textbook gives an unnecessarily complicated example where Frank specializes completely, but Rose continues to produce both goods but at different quantities — still, trade produces gains.

A more advanced course could investigate whether Rose could become even "more better off" than point A*!



Individuals specialize completely

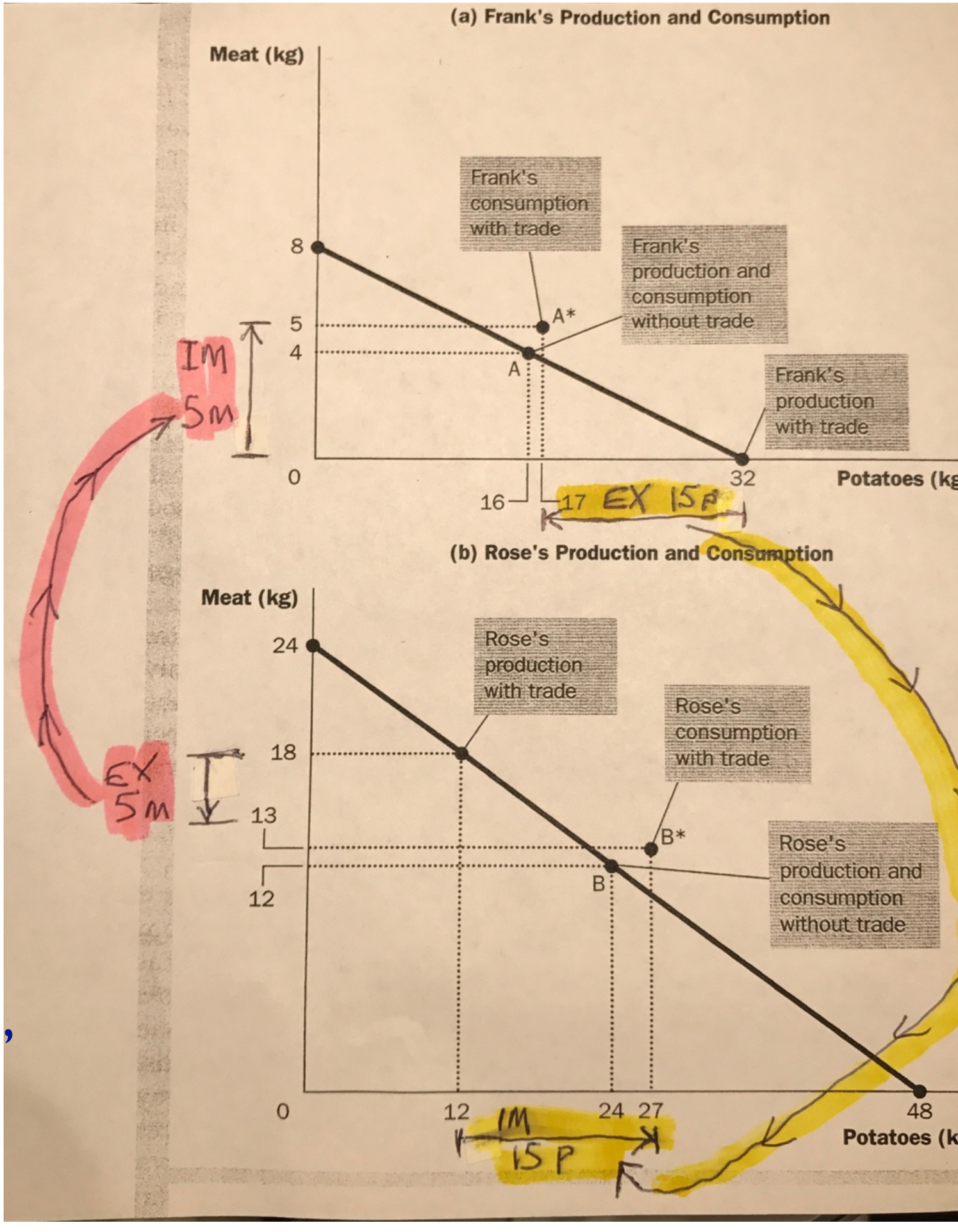
When individuals discover their comparative advantage,
they specialize completely
in the production of that product.
They do not also produce other things.

The best example of this is your career.
If you are getting an education to become an engineer or a doctor,
you will do engineering or medical work all your life,
even if you work for several different employers, and even if you have to modify or adjust your skills as the economy changes.
(While some people change careers, you rarely meet a half-doctor-half-engineer!)

At after-trade points A* and B*, the 15 extra potatoes that Frank produces but does not eat are exported to Rose...

...in exchange for the 5 extra meats that she produces but does not eat, which he imports from her.

The textbook has them agreeing to exchange **15p for 5m** which would be an "opportunity cost with trade" of **3p for 1m** or **0.33m for 1p**



Does the exchange rate *have* to be 3p for 1m?

No.

There will be an incentive to trade as long as the trading exchange rate is *between* the opportunity costs of the trading partners (between 4p and 2p, in this example).

How do they settle on an exact exchange rate for trade?

By negotiating.

If one is an economic or political bully, he or she will try to take the most gains for him/herself, leaving the trading partner with a very small gain, but still enough to give an incentive to trade (otherwise the bully would not be able to gain anything).

Or, if they were already overwhelmed by all the material in this chapter, they might just split it down the middle.

But the best answer is probably **markets will determine** the exchange rates for trade, just as they determine most prices for goods and services within the economy. (That's the next chapter!)

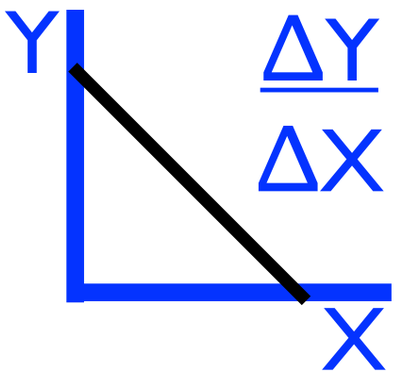
Does getting more of both goods always make us better off?

Even though you might think that having more of everything would be great, the answer is **no**!

If you were a poor student surviving by eating cat food and a bit of high-quality beef, to be better off you would like to eat more beef and less cat food!

And, while we're at it, just because a point is beyond your PPF, it does not necessarily mean that you would be better off consuming the combination of products represented by that point. Clearly, there is more to this, and you can learn about the fuller analysis in a more advanced micro course.

Individuals have straight-line PPFs



Because:
Regardless of how much of something a person produces, that person's abilities remain the same.
Therefore their opportunity costs remain the same, regardless of how much they produce.

When opportunity costs remain the same (i.e., don't change) we say these are **constant** opportunity costs.

Since opportunity costs are represented by the slope of a line, constant opportunity costs will be indicated by a line with a constant or unchanging slope — in other words, a straight line.

The PPF of a country is sloped…

We'll save this for next time!

the end!

Comparative vs Absolute

- productivity relates to absolute advantage
- opportunity cost relates to comparative advantage

- you have an absolute advantage if you are the least-cost producer (or the most efficient producer) in the production of every good or service

- you have a comparative advantage if you have the lowest opportunity cost in the production of a particular good or service

- lawyer and secretary example
- calculations...