

Chapter 21 – The Theory of Consumer Choice

***In this chapter,
look for the answers to these questions:***

- How does the budget constraint represent the choices a consumer can afford?
- How do indifference curves represent the consumer's preferences?
- What determines how a consumer divides her resources between two goods?
- How does the theory of consumer choice explain decisions such as how much a consumer saves, or how much labor she supplies?

Introduction

- Recall one of the Ten Principles from Chapter 1:
People face tradeoffs.
 - Buying more of one good leaves less income to buy other goods.
 - Working more hours means more income and more consumption, but less leisure time.
 - Reducing saving allows more consumption today but reduces future consumption.
- This chapter explores how consumers make choices like these.

The Budget Constraint: What the Consumer Can Afford

- Example:
Hurley divides his income between two goods:
fish and mangos.
- A “consumption bundle” is a particular combination of the goods, e.g., 40 fish & 300 mangos.
- **Budget constraint:** the limit on the consumption bundles that a consumer can afford

ACTIVE LEARNING 1

The budget constraint

Hurley's income: \$1200

Prices: $P_F = \$4$ per fish, $P_M = \$1$ per mango

- A.** If Hurley spends all his income on fish, how many fish does he buy?
- B.** If Hurley spends all his income on mangoes, how many mangoes does he buy?
- C.** If Hurley buys 100 fish, how many mangoes can he buy?
- D.** Plot each of the bundles from parts **A** – **C** on a graph that measures fish on the horizontal axis and mangoes on the vertical, connect the dots.

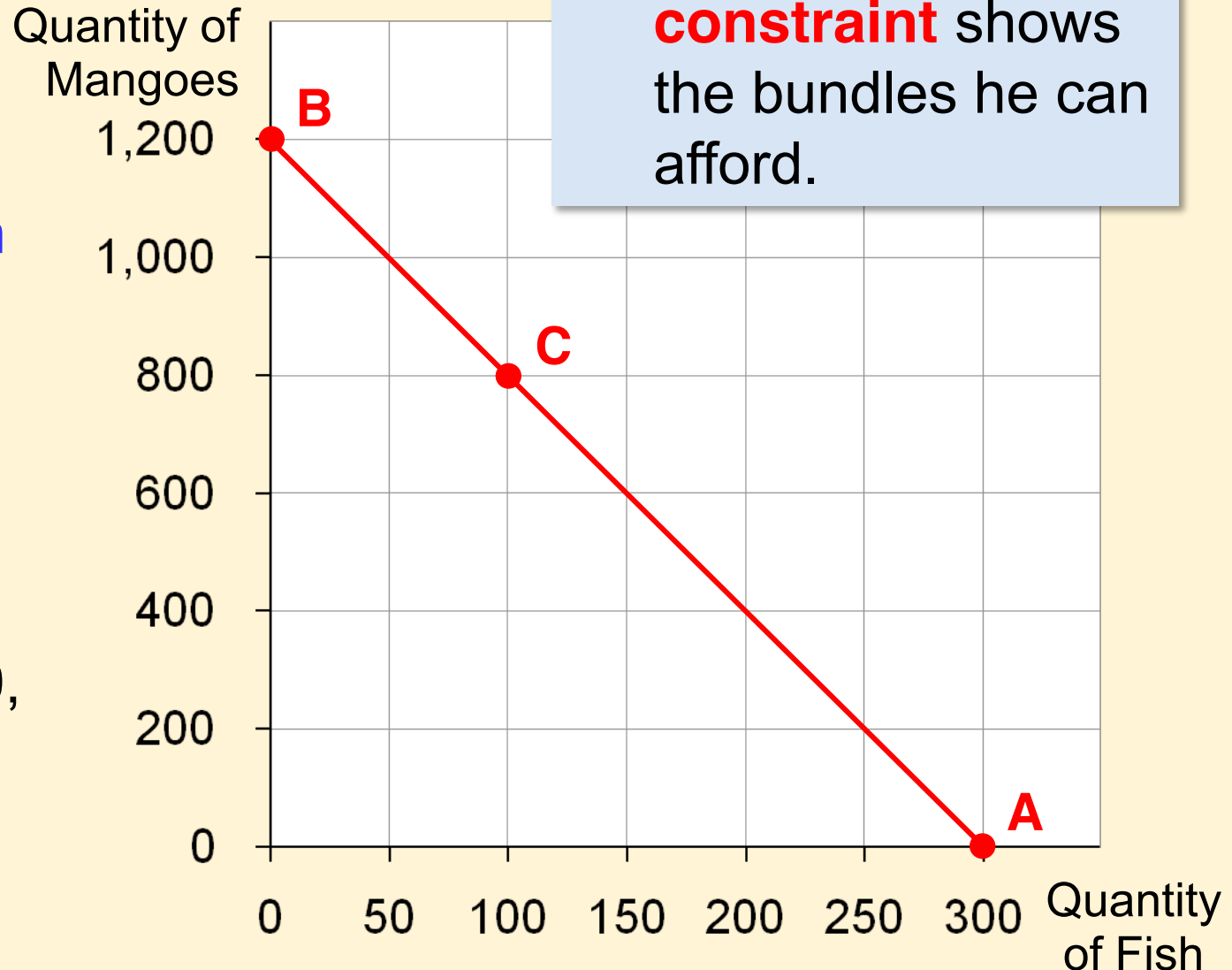
ACTIVE LEARNING 1

Answers

A. $\$1200/\4
= 300 fish

B. $\$1200/\1
= 1200
mangoes

C. 100 fish
cost \$400,
\$800 left
buys 800
mangoes



The Slope of the Budget Constraint

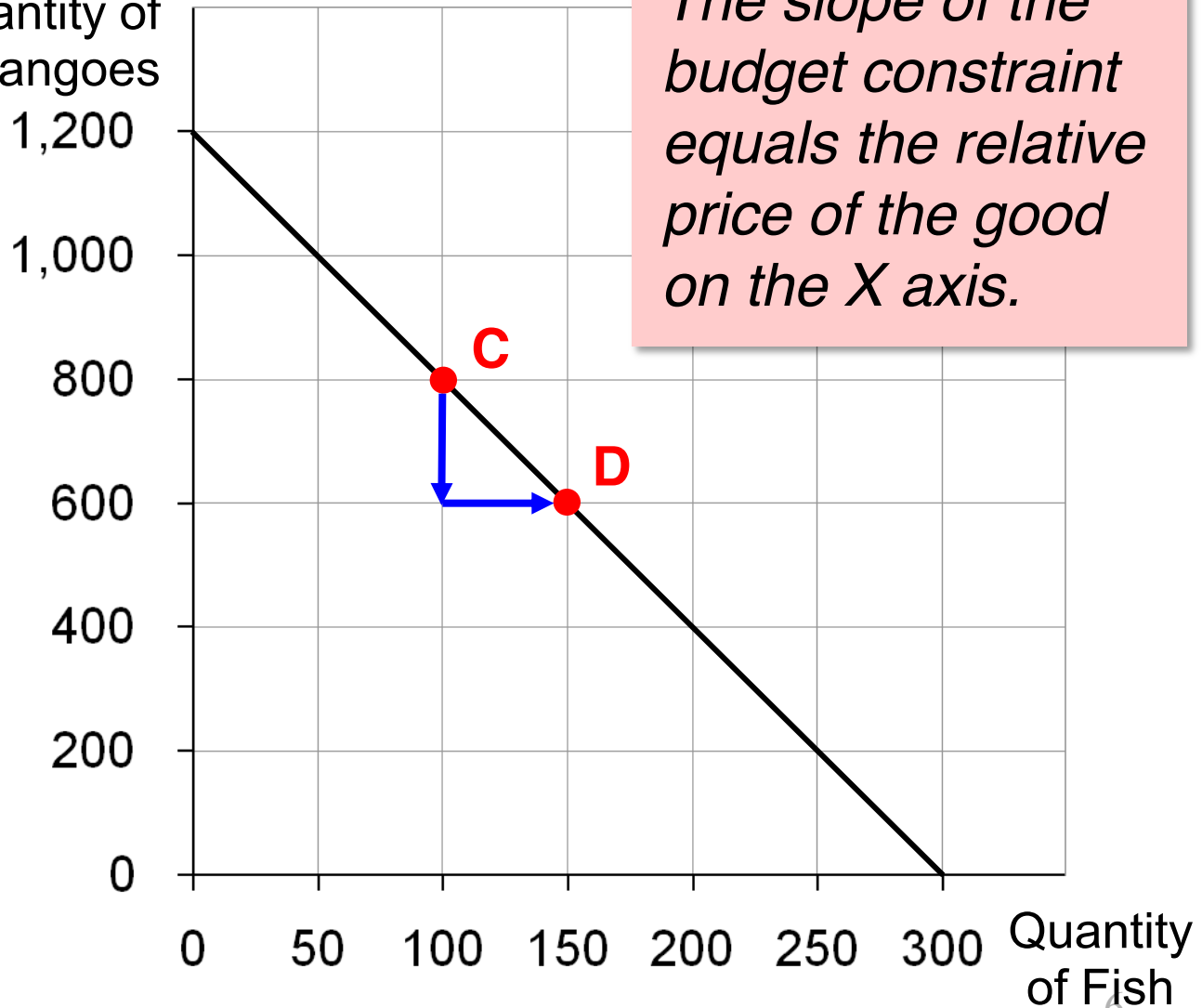
From **C** to **D**, Quantity of

“rise” =
–200 mangoes

“run” =
+50 fish

Slope = – 4

Hurley must
give up
4 mangoes
to get one fish.



ACTIVE LEARNING 2

Budget constraint, *continued*

Show what happens to Hurley's budget constraint if:

- A.** His income falls to \$800.
- B.** The price of mangoes rises to
 $P_M = \$2$ per mango

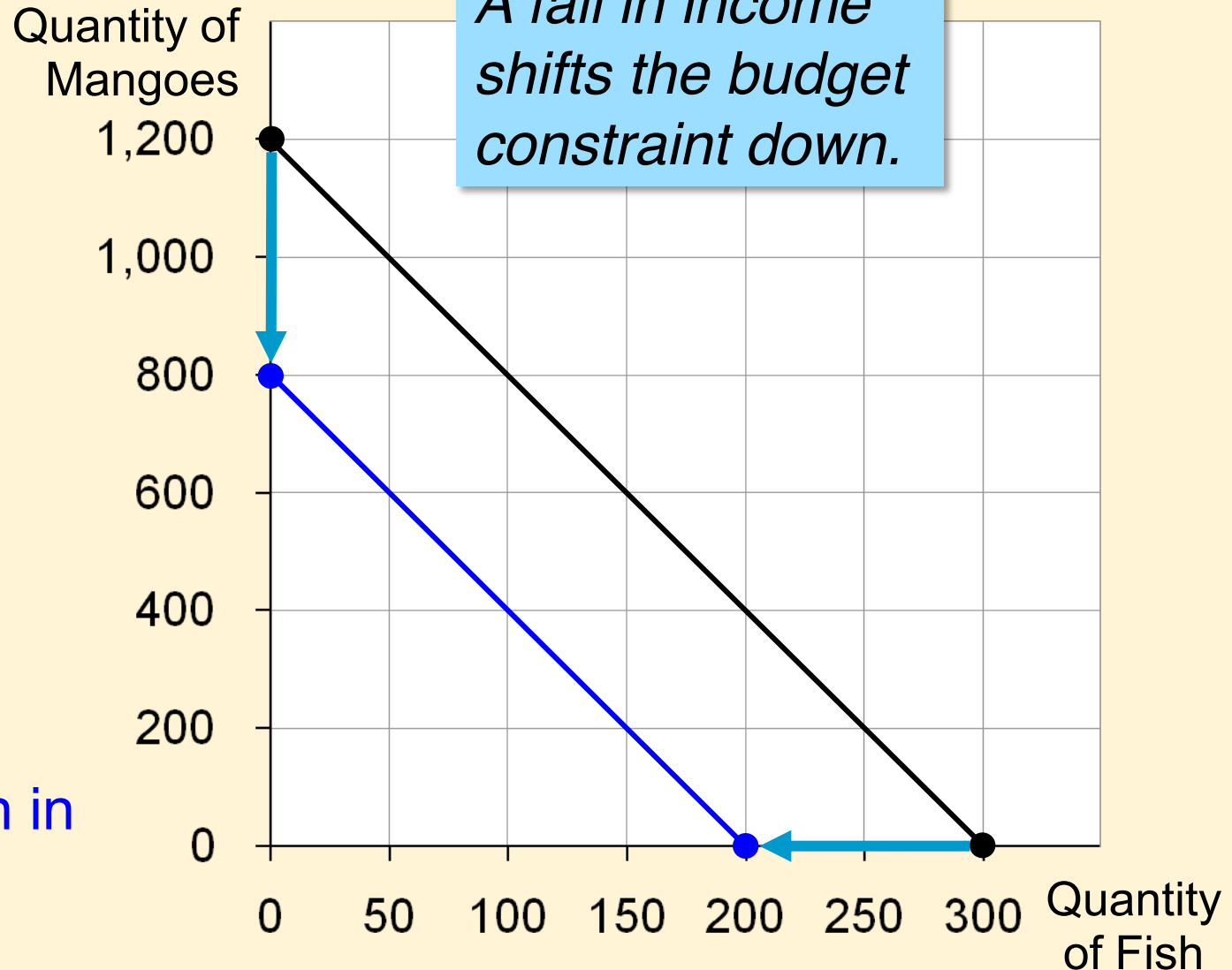
ACTIVE LEARNING 2

Answers, part A

Now,
Hurley
can buy
 $\$800/\4
 $= 200$ fish

or
 $\$800/\1
 $= 800$
mangoes

or any
combination in
between.



ACTIVE LEARNING 2

Answers, part B

Hurley
can still buy
300 fish.

But now he
can only buy
 $\$1200/\$2 =$
600 mangoes.

Notice:
slope is smaller,
relative price of
fish is now only
2 mangoes.

Quantity of
Mangoes

1,200

1,000

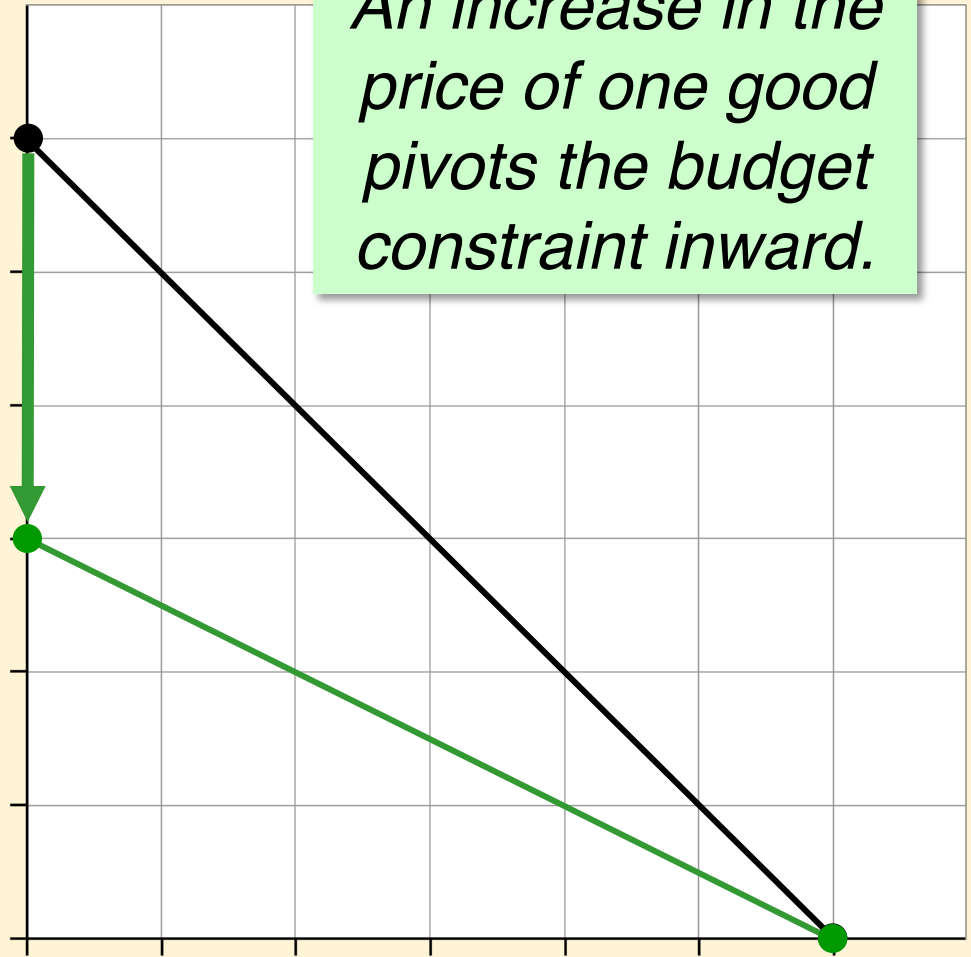
800

600

400

200

0

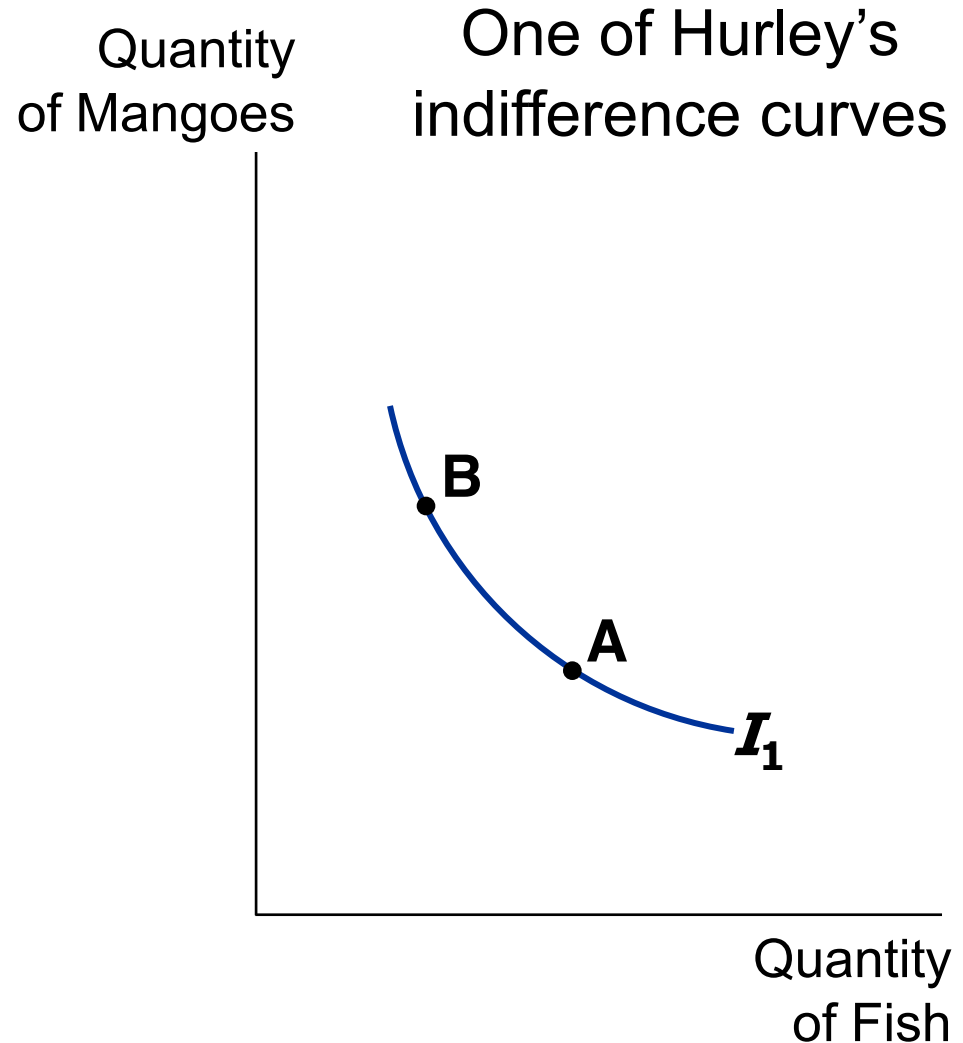


Quantity
of Fish

Preferences: What the Consumer Wants

Indifference curve:
shows consumption bundles that give the consumer the same level of satisfaction

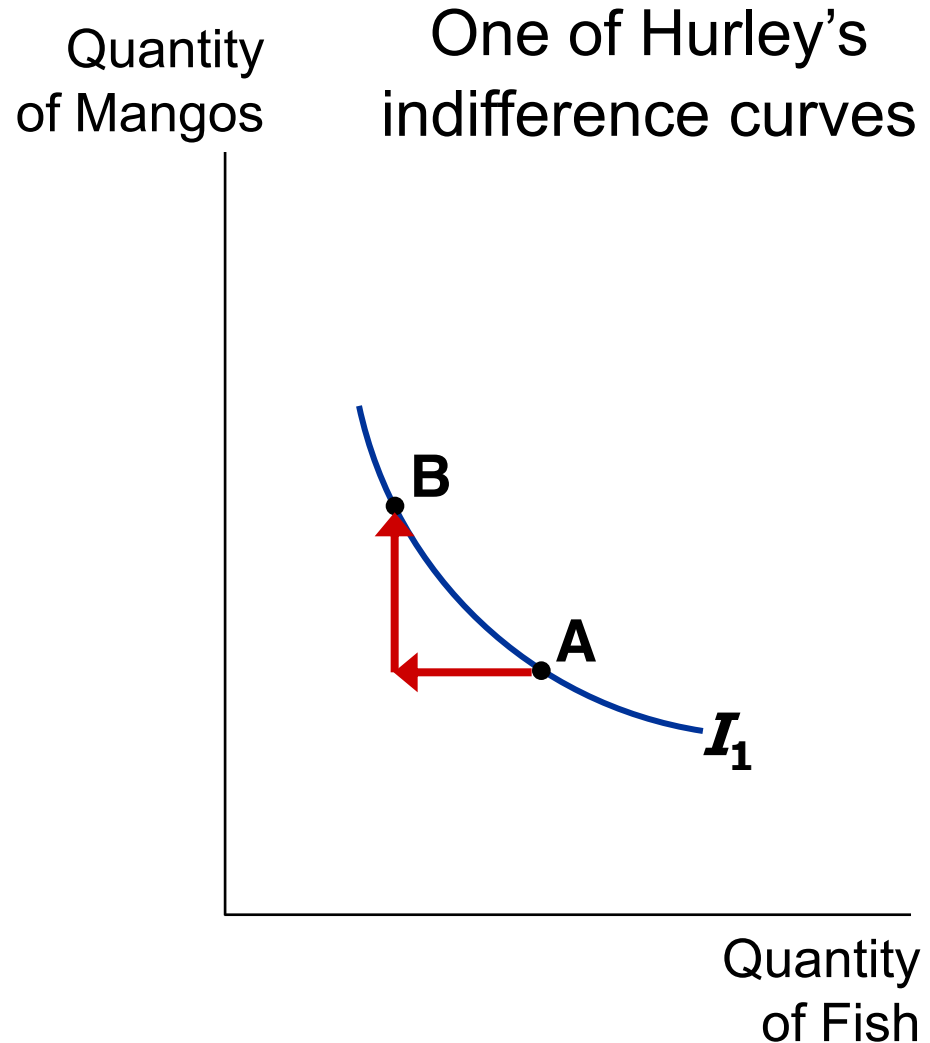
A, **B**, and all other bundles on I_1 make Hurley equally happy: he is *indifferent* between them.



Four Properties of Indifference Curves

1. Indifference curves are downward-sloping.

If the quantity of fish is reduced, the quantity of mangos must be increased to keep Hurley equally happy.

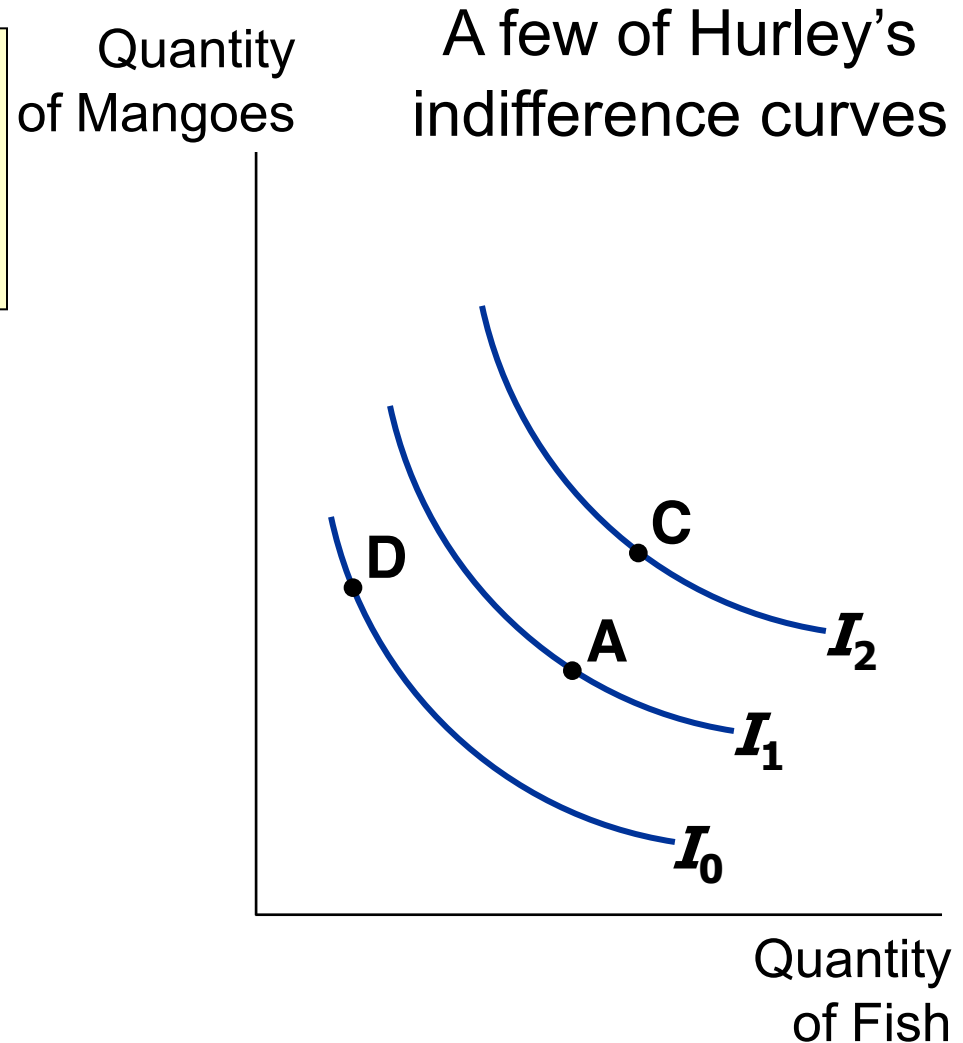


Four Properties of Indifference Curves

2. Higher indifference curves are preferred to lower ones.

Hurley prefers every bundle on I_2 (like **C**) to every bundle on I_1 (like **A**).

He prefers every bundle on I_1 (like **A**) to every bundle on I_0 (like **D**).



Four Properties of Indifference Curves

3. Indifference curves cannot cross.

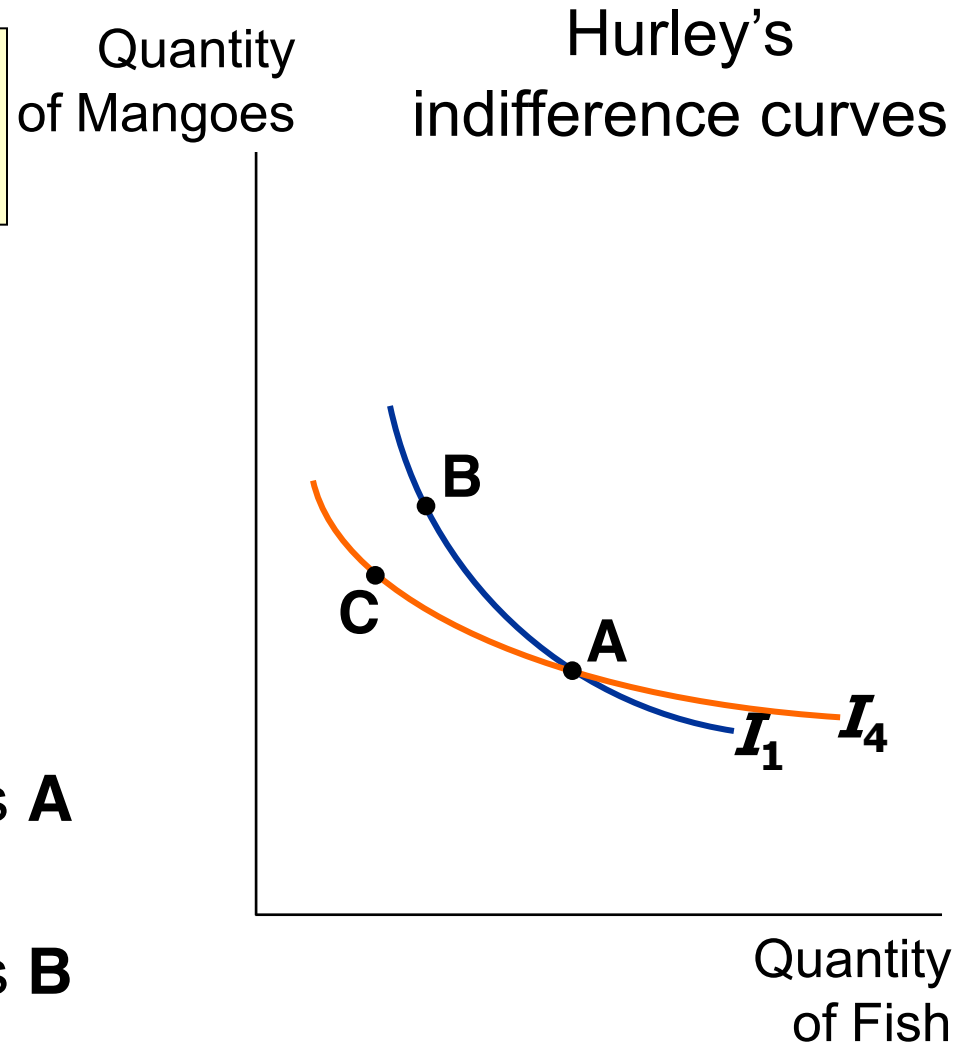
Suppose they did.

Hurley should prefer **B** to **C**, since **B** has more of both goods.

Yet, Hurley is indifferent between **B** and **C**:

He likes **C** as much as **A** (both are on I_4).

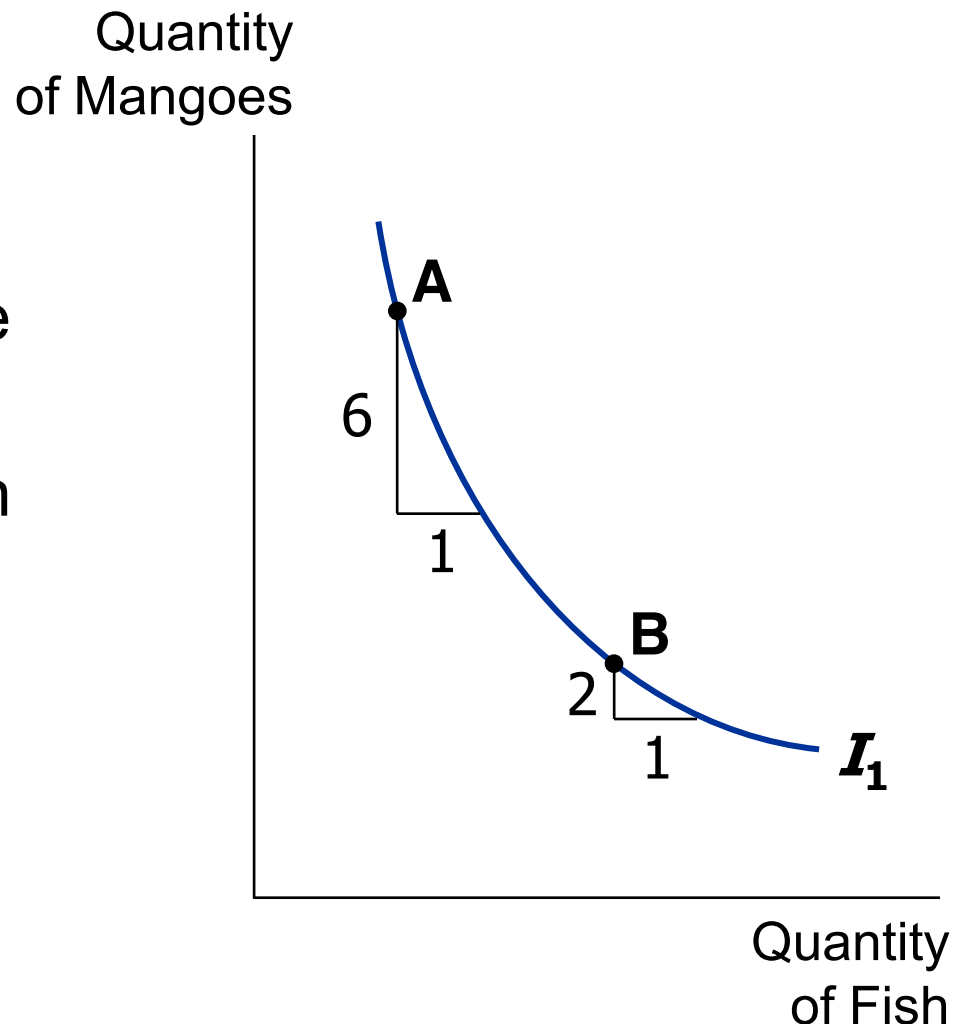
He likes **A** as much as **B** (both are on I_1).



Four Properties of Indifference Curves

4. Indifference curves are bowed inward.

Hurley is willing to give up more mangoes for a fish if he has few fish (**A**) than if he has many (**B**).



The Marginal Rate of Substitution

Marginal rate of substitution (MRS):

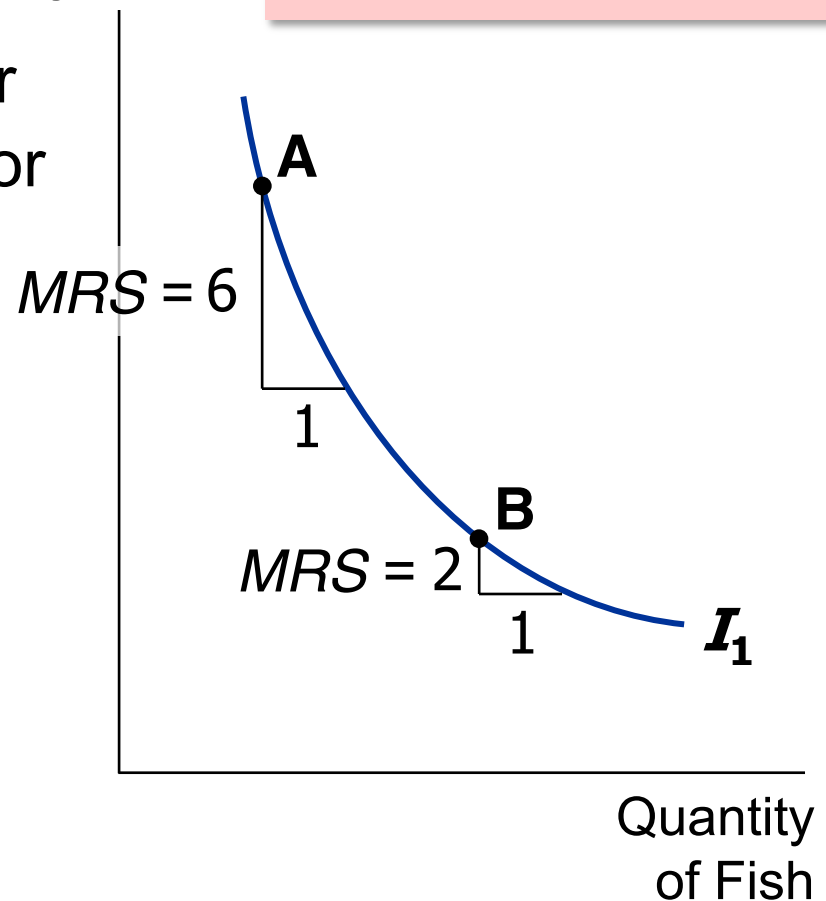
the rate at which a consumer is willing to trade one good for another.

Hurley's MRS is the amount of mangoes he would substitute for another fish.

MRS falls as you move down along an indifference curve.

Quantity
of Mangoes

*MRS = slope of
indifference curve*

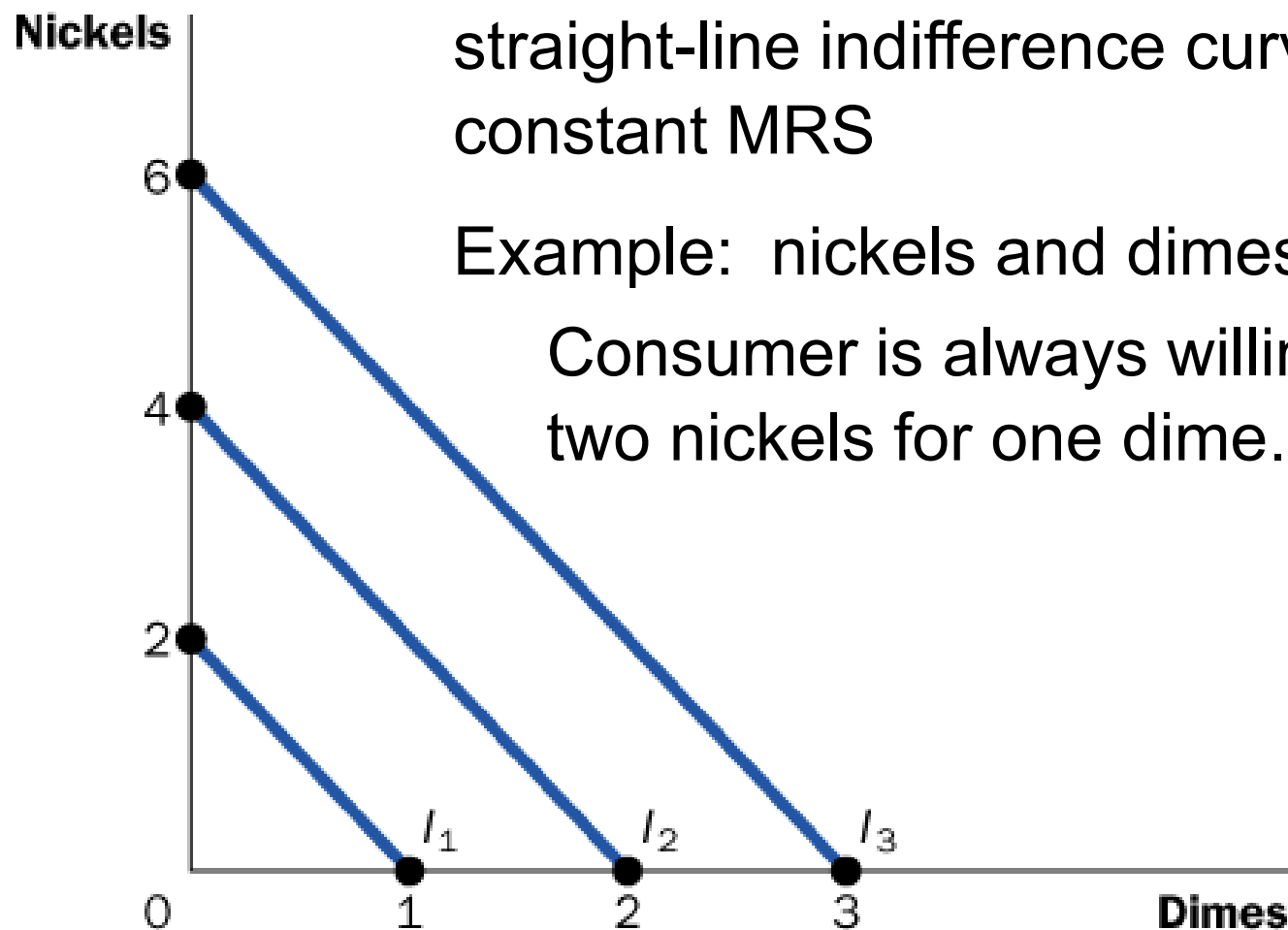


One Extreme Case: Perfect Substitutes

Perfect substitutes: two goods with straight-line indifference curves, constant MRS

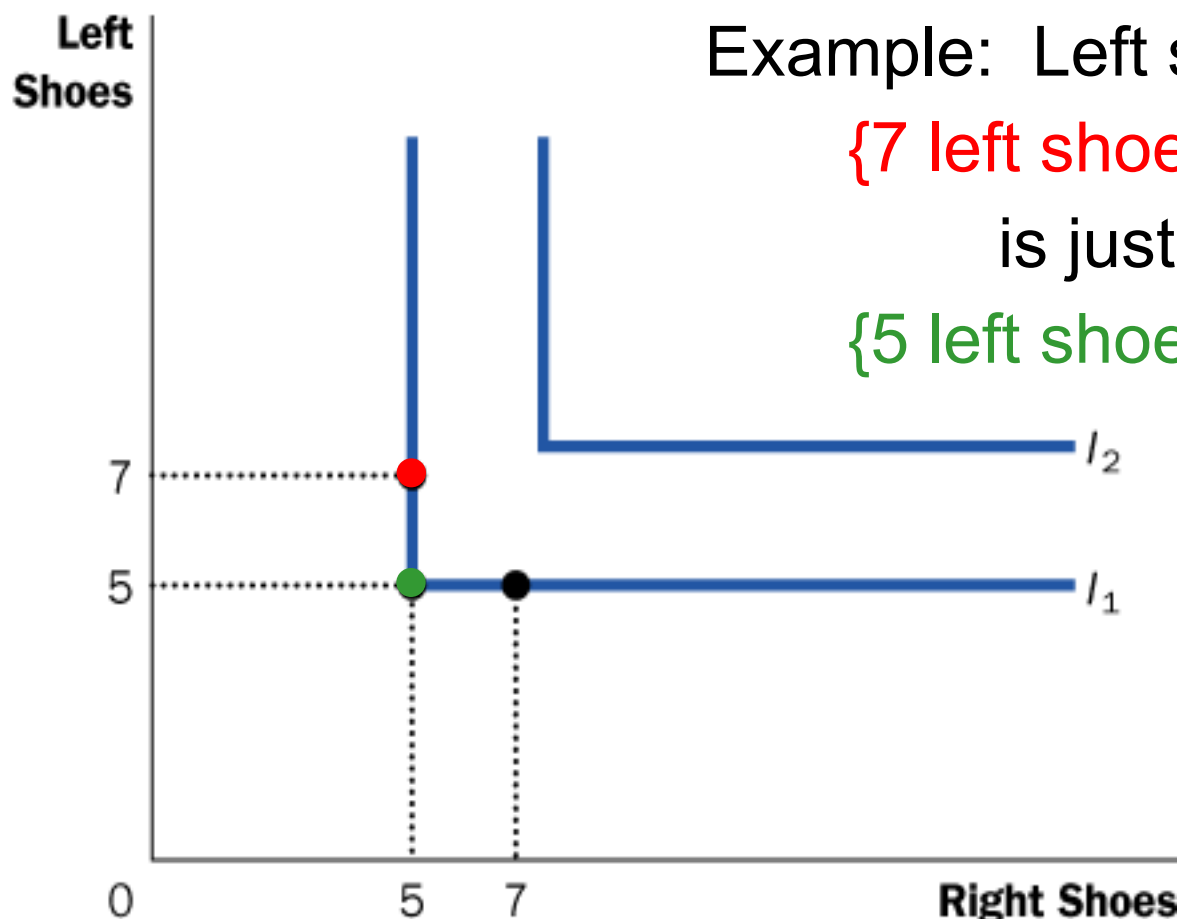
Example: nickels and dimes

Consumer is always willing to trade two nickels for one dime.



Another Extreme Case: Perfect Complements

Perfect complements: two goods with right-angle indifference curves



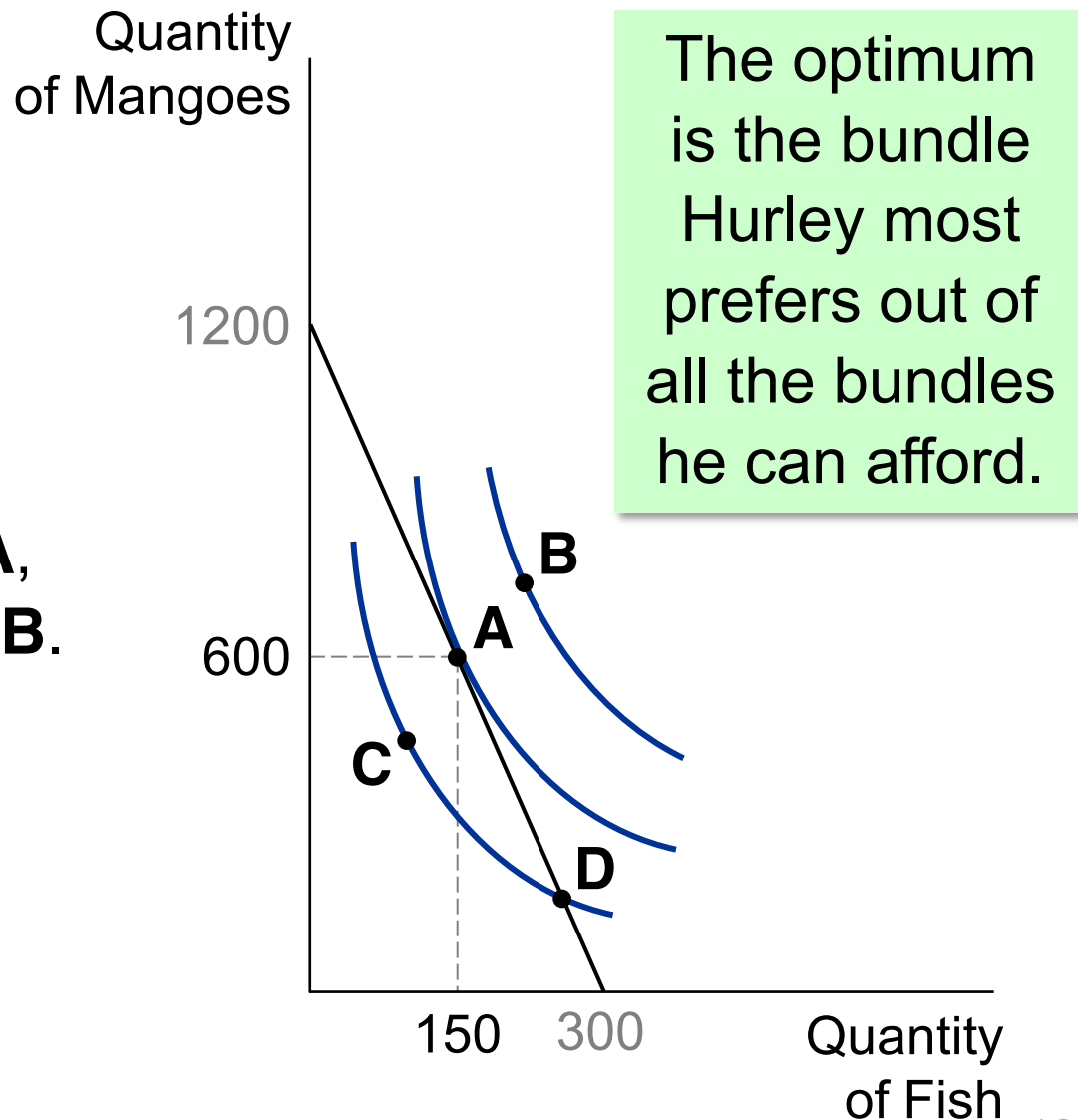
Example: Left shoes, right shoes
{7 left shoes, 5 right shoes}
is just as good as
{5 left shoes, 5 right shoes}

Optimization: What the Consumer Chooses

A is the *optimum*: the point on the budget constraint that touches the highest possible indifference curve.

Hurley prefers **B** to **A**, but he cannot afford **B**.

Hurley can afford **C** and **D**, but **A** is on a higher indifference curve.



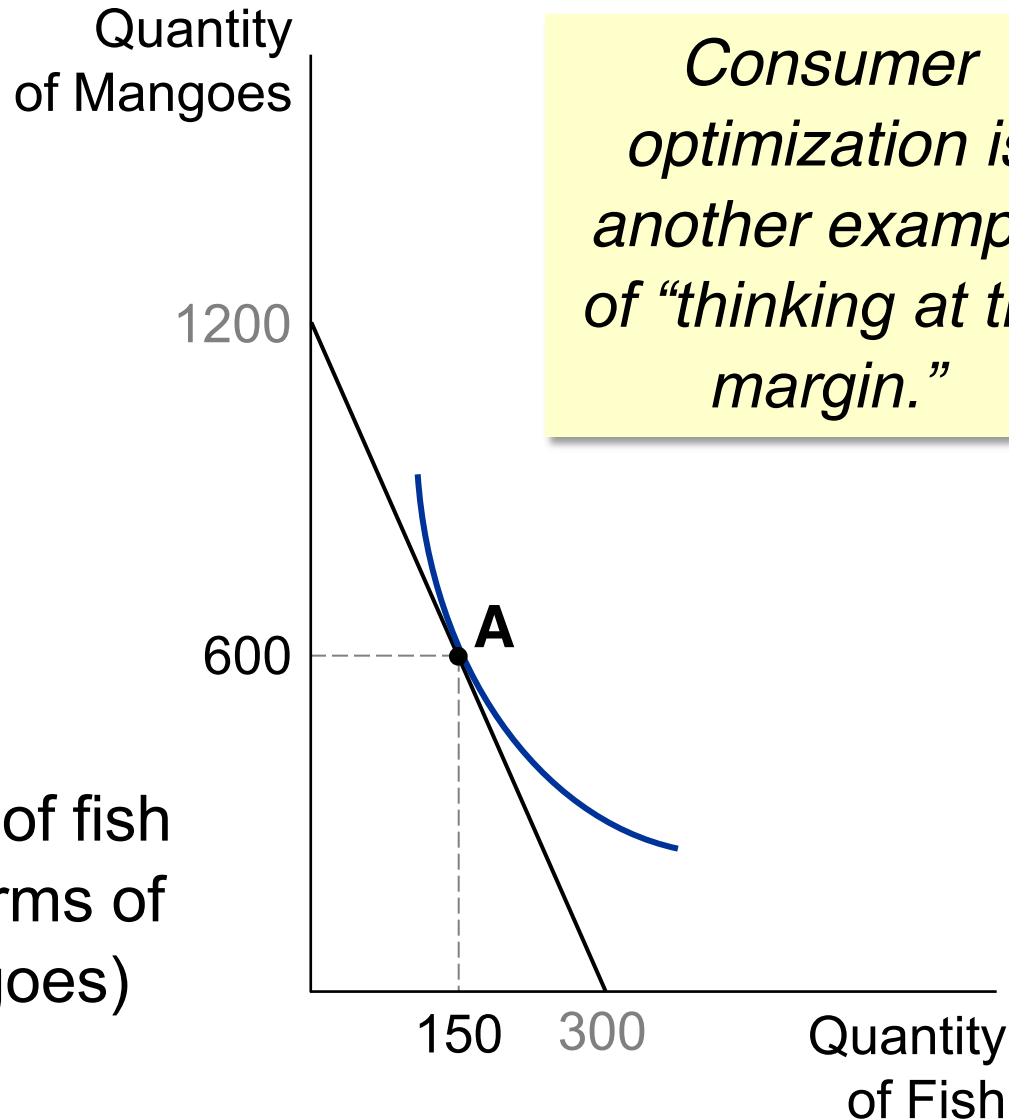
Optimization: What the Consumer Chooses

At the optimum,
slope of the
indifference curve
equals
slope of the budget
constraint:

$$\text{MRS} = P_F / P_M$$

marginal
value of fish
(in terms of
mangoes)

price of fish
(in terms of
mangoes)

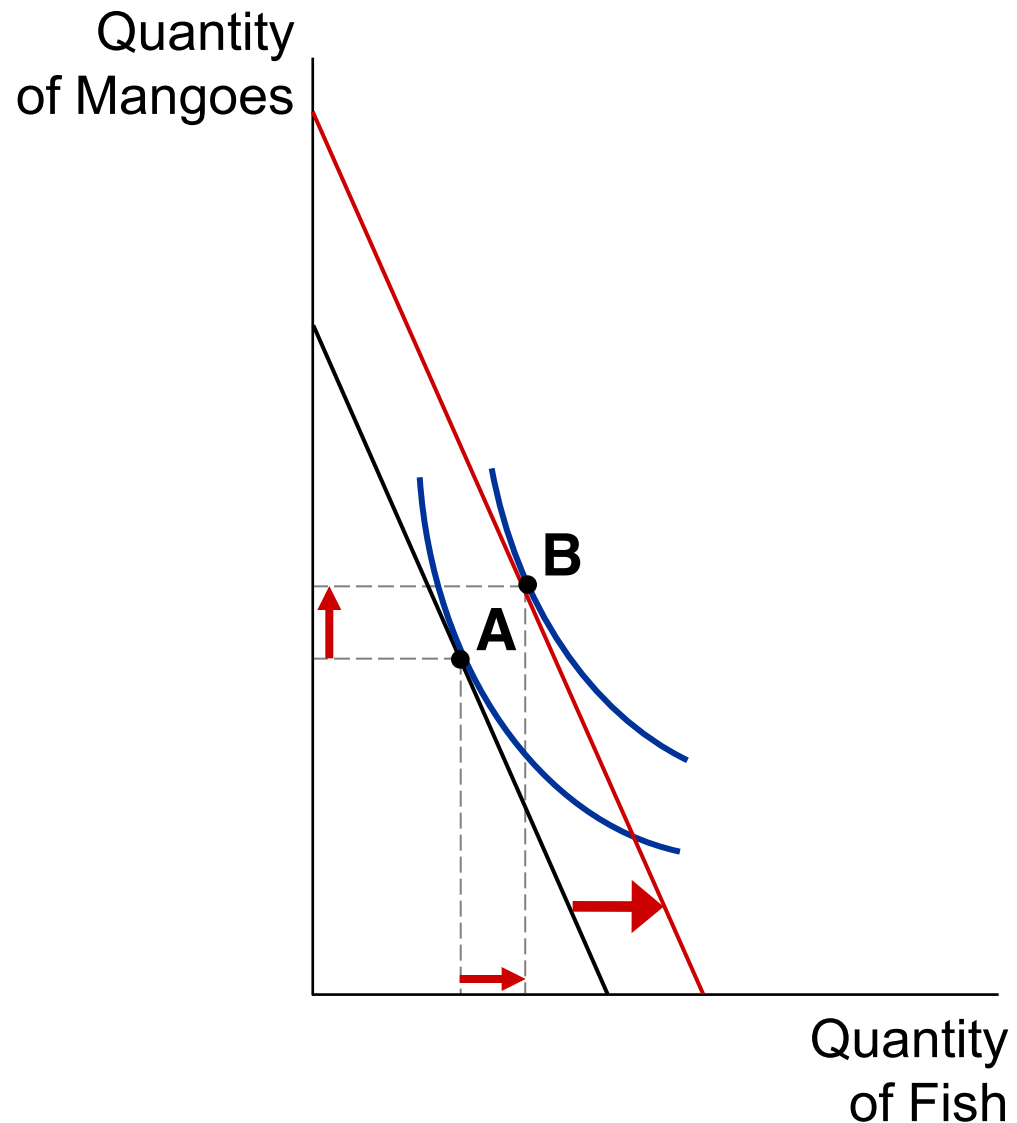


Consumer optimization is another example of “thinking at the margin.”

The Effects of an Increase in Income

An increase in income shifts the budget constraint outward.

If both goods are “normal,” Hurley buys more of each.



ACTIVE LEARNING 3

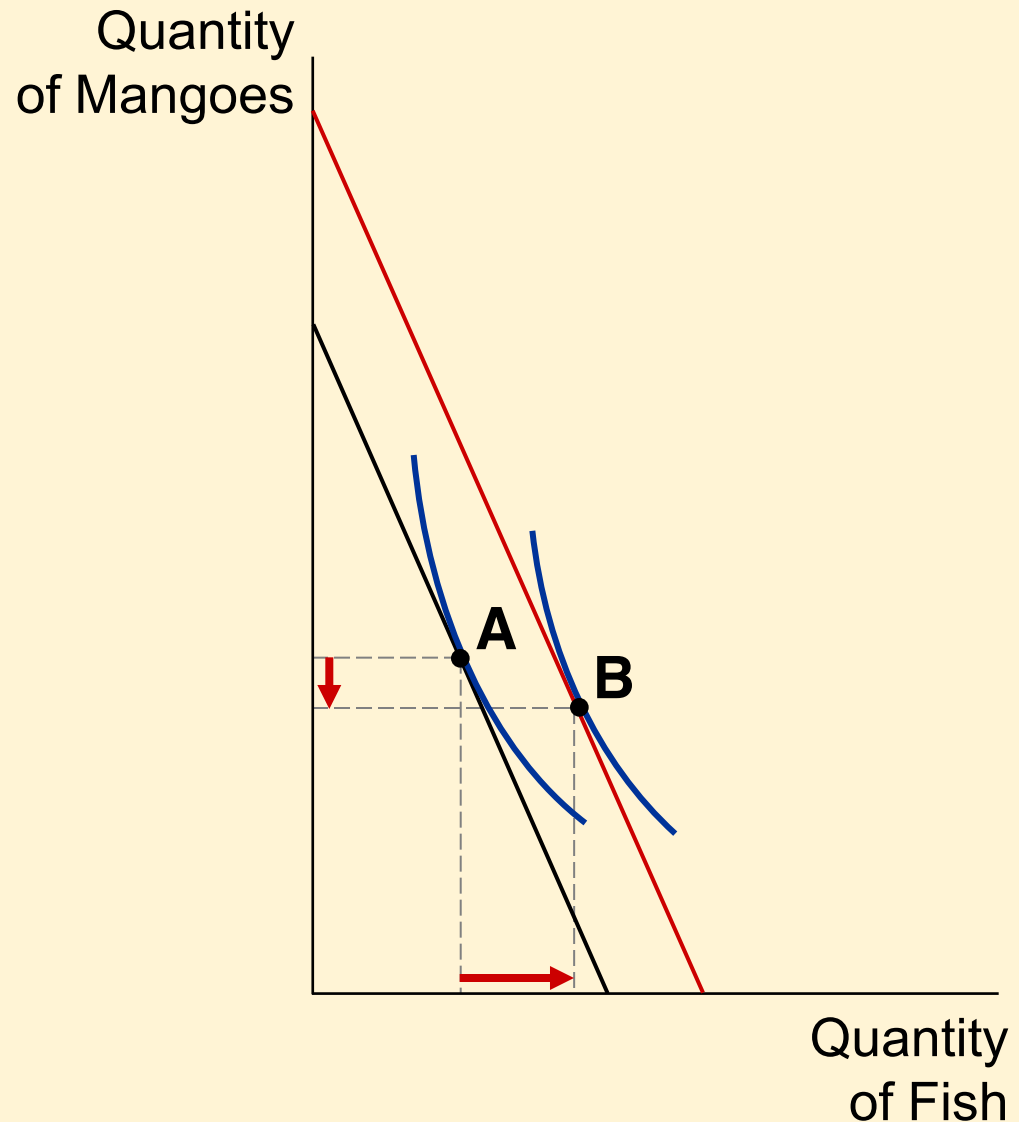
Inferior vs. normal goods

- An increase in income increases the quantity demanded of **normal goods** and reduces the quantity demanded of **inferior goods**.
- Suppose fish is a normal good but mangoes are an inferior good.
- Use a diagram to show the effects of an increase in income on Hurley's optimal bundle of fish and mangoes.

ACTIVE LEARNING 3

Answers

If mangoes are inferior, the new optimum will contain fewer mangoes.



The Effects of a Price Change

Initially,

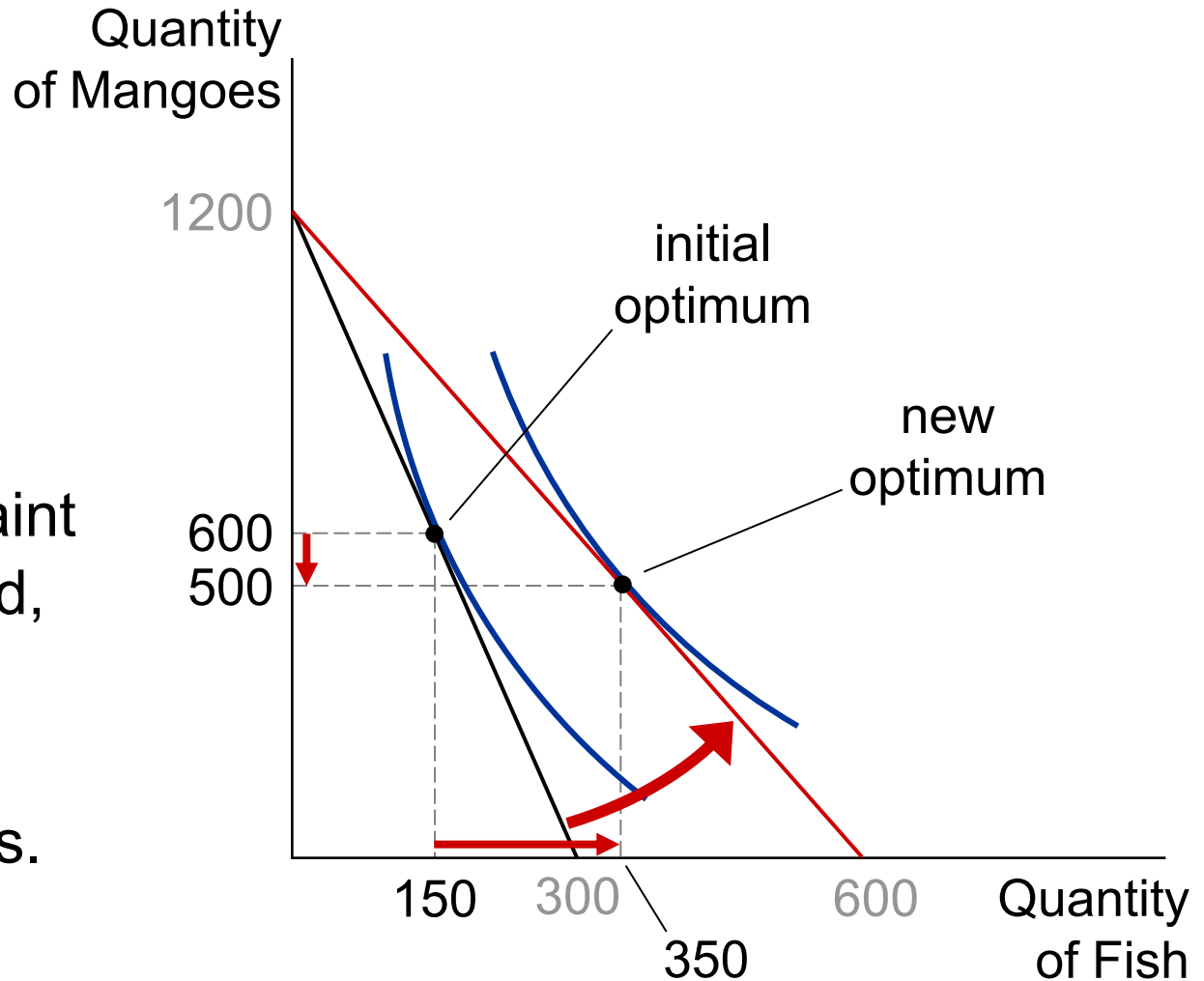
$$P_F = \$4$$

$$P_M = \$1$$

P_F falls to \$2

budget constraint rotates outward,

Hurley buys more fish and fewer mangoes.



The Income and Substitution Effects

A fall in the price of fish has two effects on Hurley's optimal consumption of both goods.

- **Income effect**

A fall in P_F boosts the purchasing power of Hurley's income, allows him to buy more mangoes and more fish.

- **Substitution effect**

A fall in P_F makes mangos more expensive relative to fish, causes Hurley to buy fewer mangoes and more fish.

Notice: *The net effect on mangoes is ambiguous.*

The Income and Substitution Effects

Initial optimum at **A**. Quantity of Mangoes

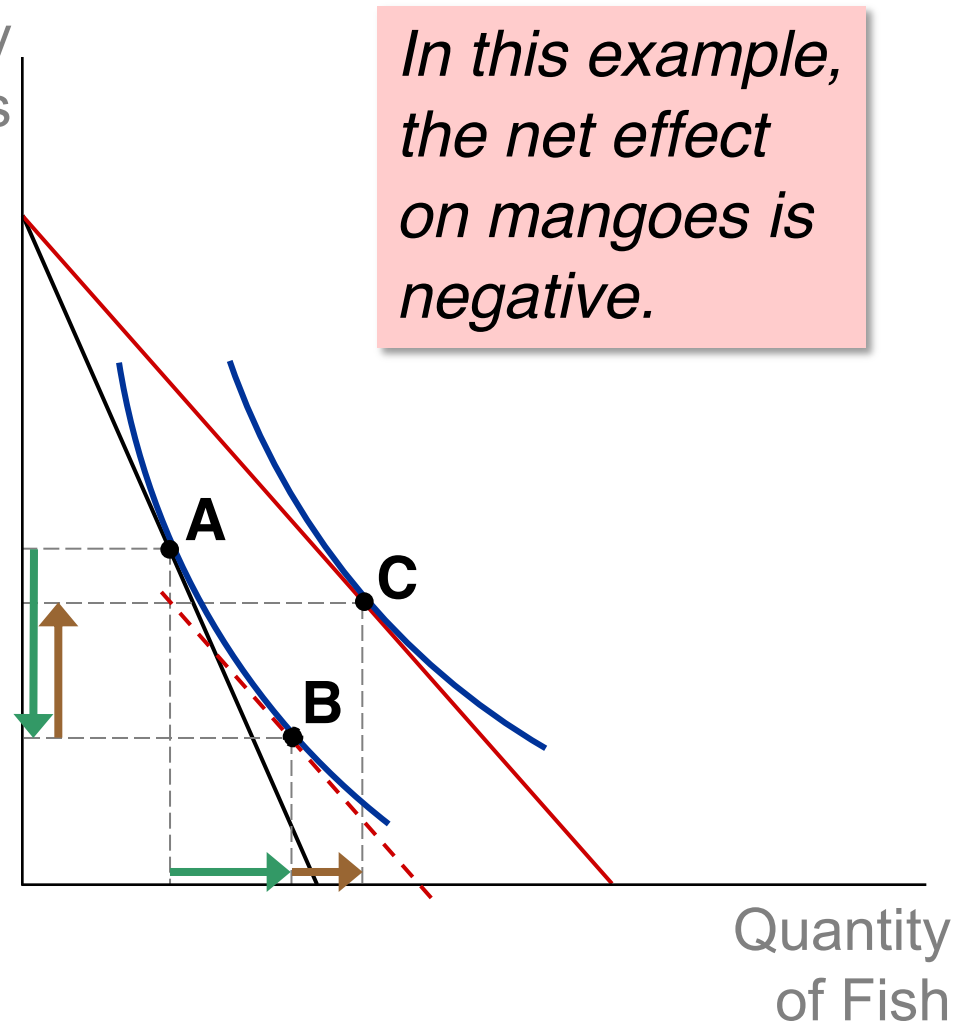
P_F falls.

Substitution effect:

from **A** to **B**,
buy more fish and
fewer mangoes.

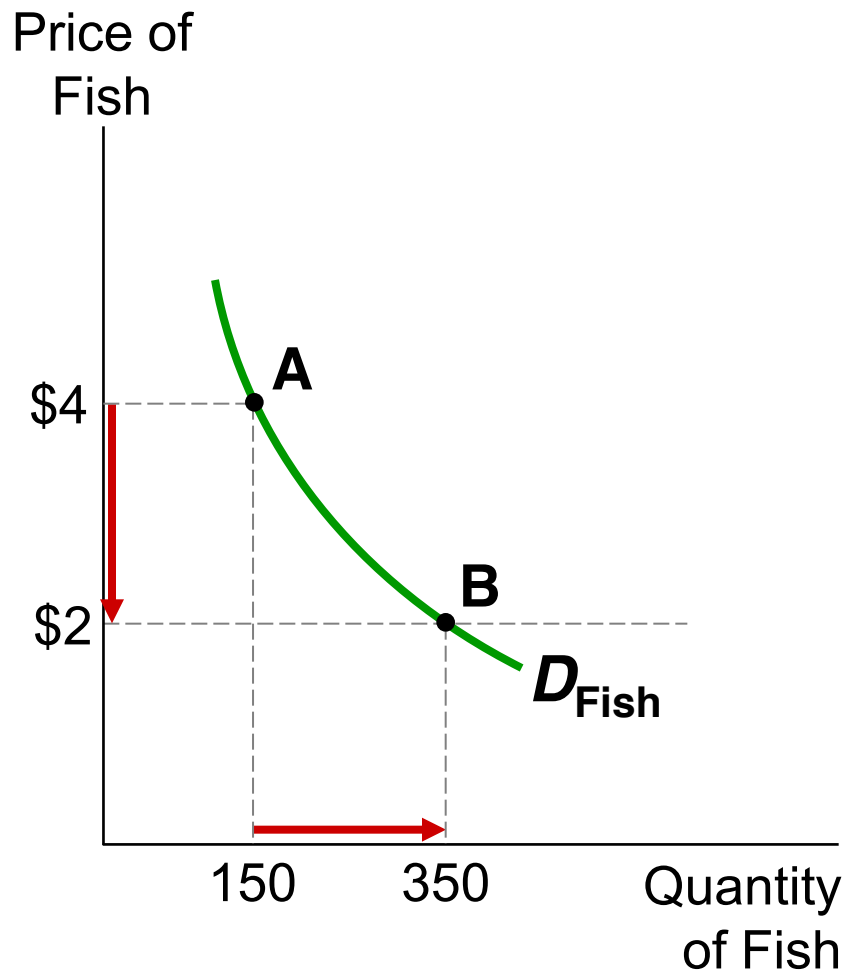
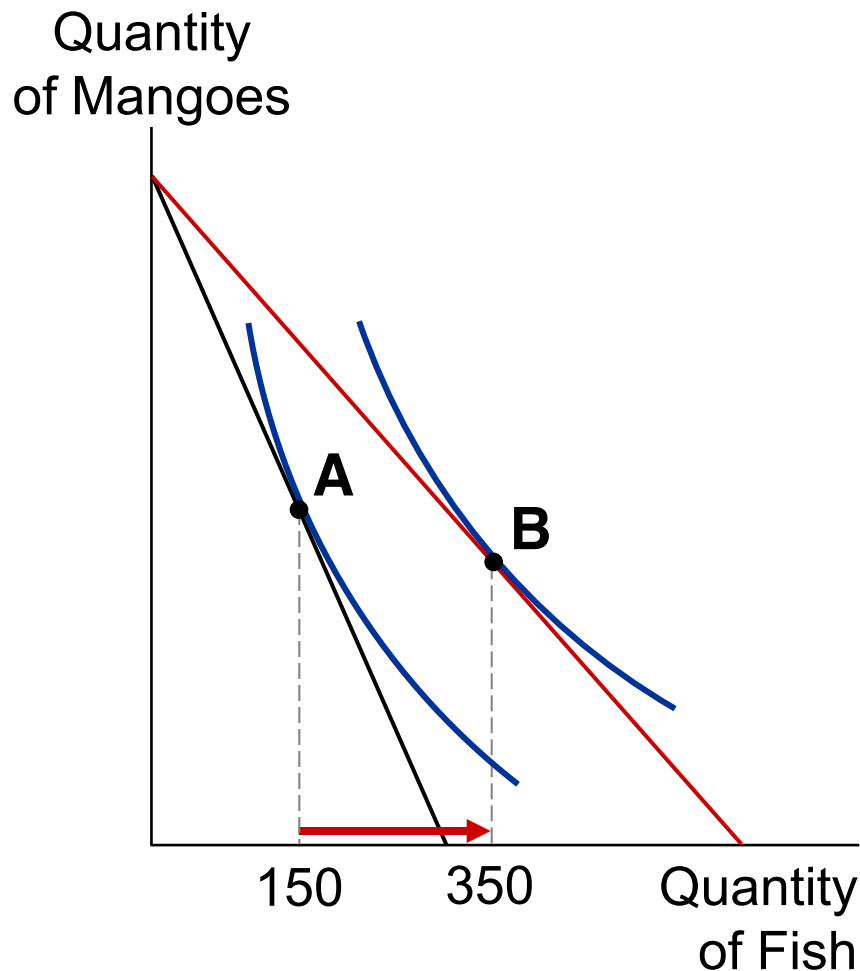
Income effect:

from **B** to **C**,
buy more of both
goods.



Deriving Hurley's Demand Curve for Fish

A: When $P_F = \$4$, Hurley demands 150 fish.
B: When $P_F = \$2$, Hurley demands 350 fish.



SUMMARY

- A consumer's budget constraint shows the possible combinations of different goods she can buy given her income and the prices of the goods. The slope of the budget constraint equals the relative price of the goods.
- An increase in income shifts the budget constraint outward. A change in the price of one of the goods pivots the budget constraint.

SUMMARY

- A consumer's indifference curves represent her preferences. An indifference curve shows all the bundles that give the consumer a certain level of happiness. The consumer prefers points on higher indifference curves to points on lower ones.
- The slope of an indifference curve at any point is the marginal rate of substitution—the rate at which the consumer is willing to trade one good for the other.

SUMMARY

- The consumer optimizes by choosing the point on her budget constraint that lies on the highest indifference curve. At this point, the marginal rate of substitution equals the relative price of the two goods.
- When the price of a good falls, the impact on the consumer's choices can be broken down into two effects, an income effect and a substitution effect.

SUMMARY

- The income effect is the change in consumption that arises because a lower price makes the consumer better off. It is represented by a movement from a lower indifference curve to a higher one.
- The substitution effect is the change that arises because a price change encourages greater consumption of the good that has become relatively cheaper. It is represented by a movement along an indifference curve.

SUMMARY

- The theory of consumer choice can be applied in many situations. It can explain why demand curves can potentially slope upward, why higher wages could either increase or decrease labor supply, and why higher interest rates could either increase or decrease saving.