

# CHAPTER 21

## The Theory of Consumer Choice

### PRINCIPLES OF Microeconomics N. Gregory Mankiw



# 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. *No savings.*
- 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

# Budget Constraint

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

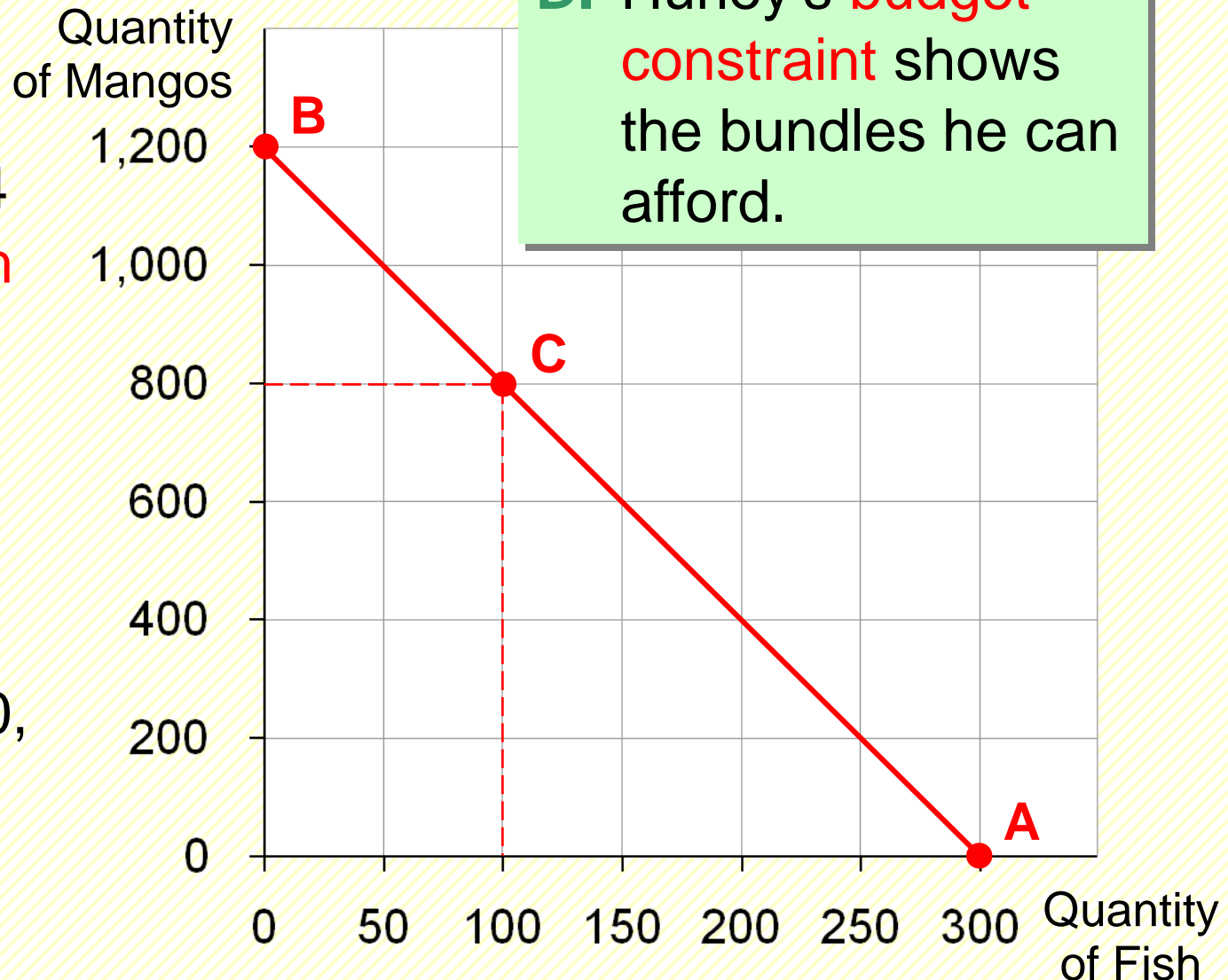
## ACTIVE LEARNING 1

### Answers

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

**B.**  $\$1200/\$1$   
= 1200 mangos

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



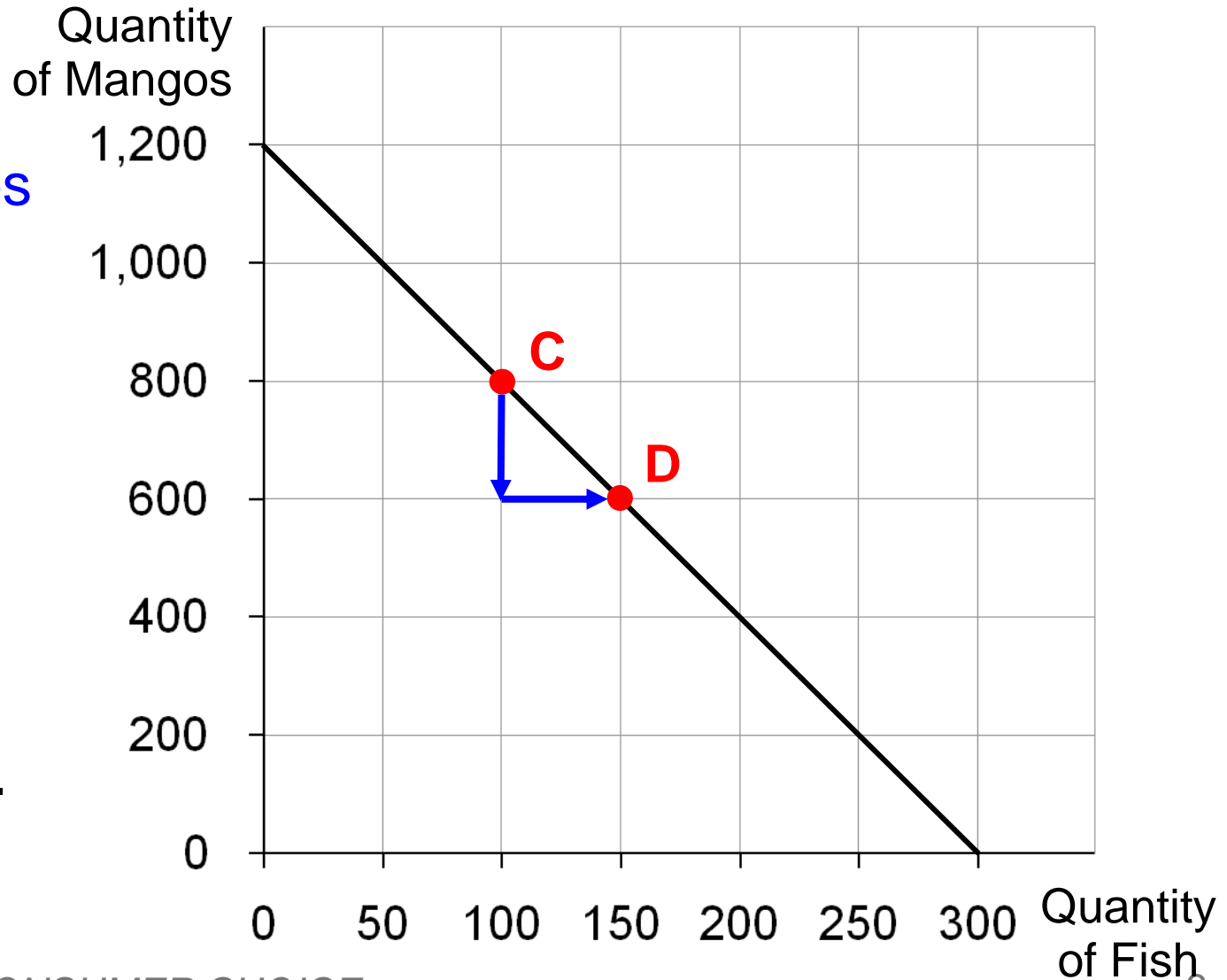
# The Slope of the Budget Constraint

From **C** to **D**,  
“rise” =  
–200 mangos

“run” =  
+50 fish

Slope = – 4

Hurley must  
give up  
4 mangos  
to get one fish.



# The Slope of the Budget Constraint

The slope of the budget constraint equals

- the rate at which Hurley can trade mangos for fish
- the opportunity cost of fish in terms of mangos
- the relative price of fish:

$$\frac{\text{price of fish}}{\text{price of mangos}} = \frac{\$4}{\$1} = 4 \text{ mangos per fish}$$



## 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 mangos rises to  
 $P_M = \$2$  per mango

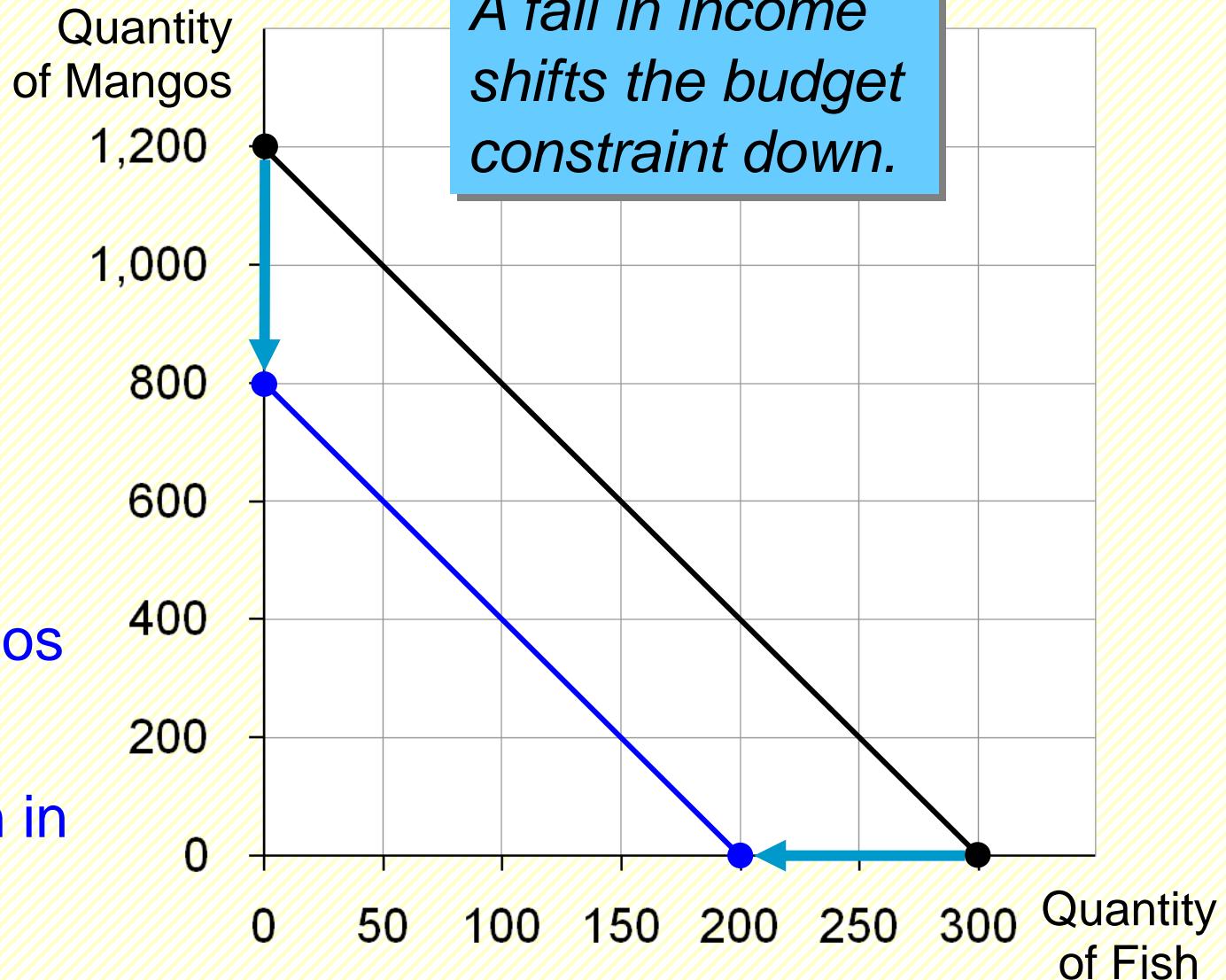
## ACTIVE LEARNING 2

### Answers, part A

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

or  
 $\$800/\$1$   
 $= 800$  mangos

or any  
combination in  
between.



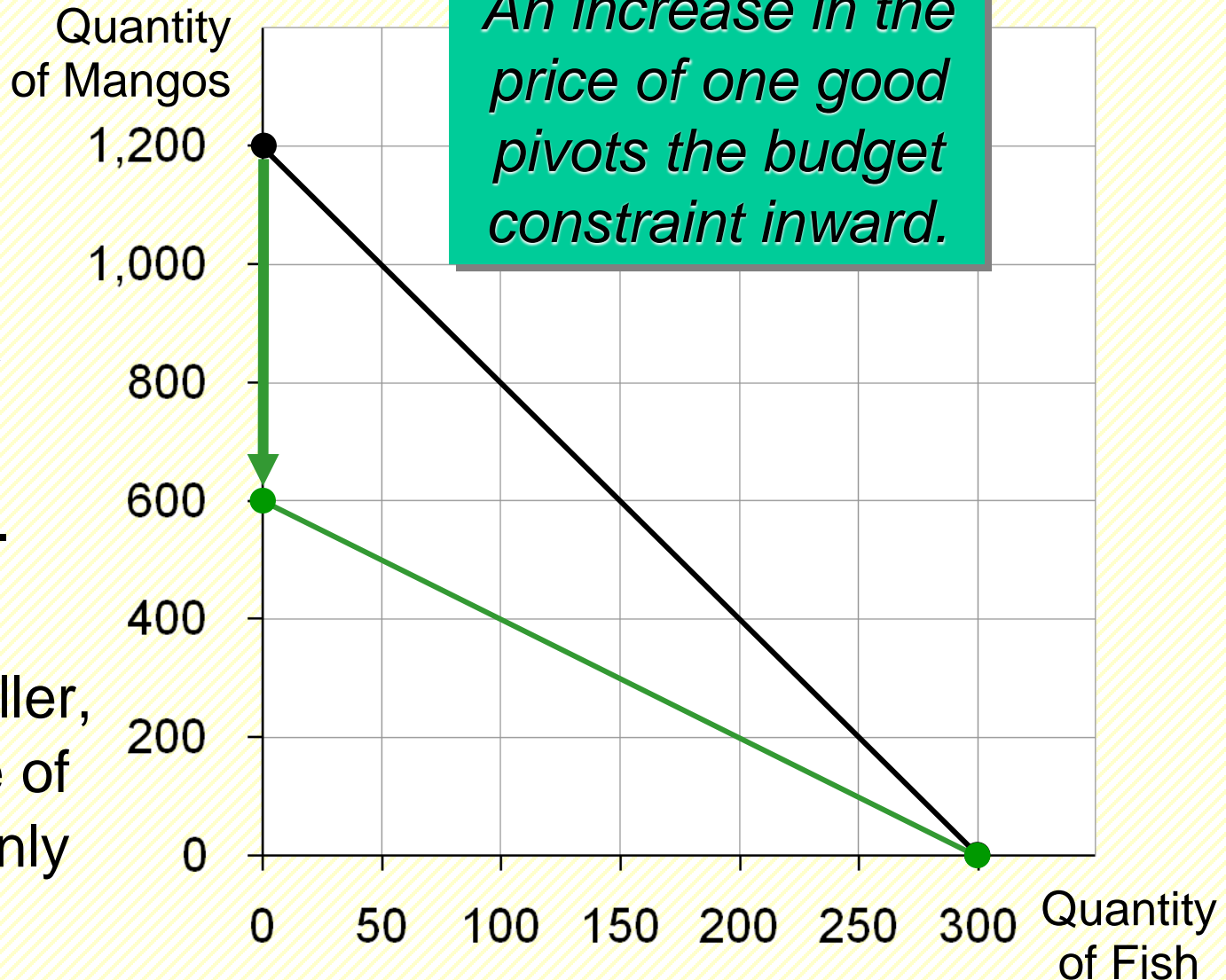
## ACTIVE LEARNING 2

### Answers, part B

Hurley  
can still buy  
**300 fish**.

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

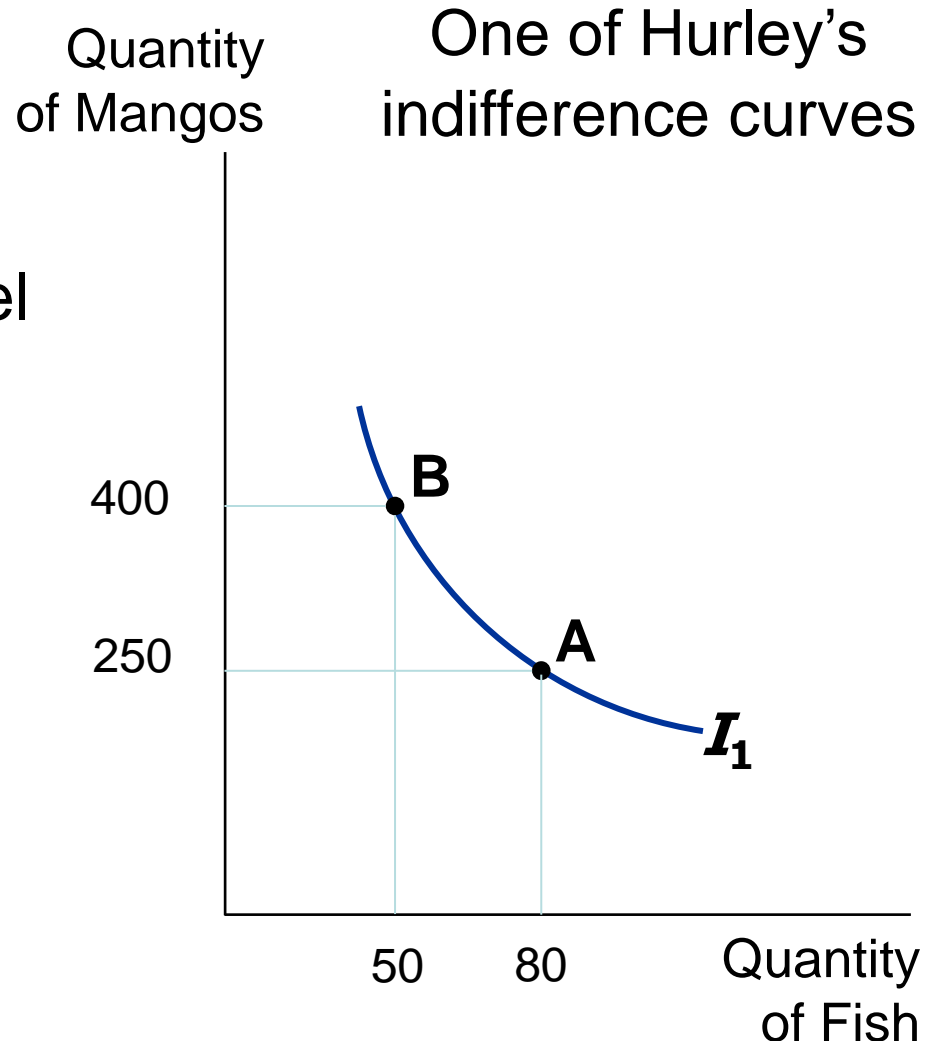
Notice:  
slope is smaller,  
relative price of  
fish is now only  
2 mangos.



# Preferences: What the Consumer Wants

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

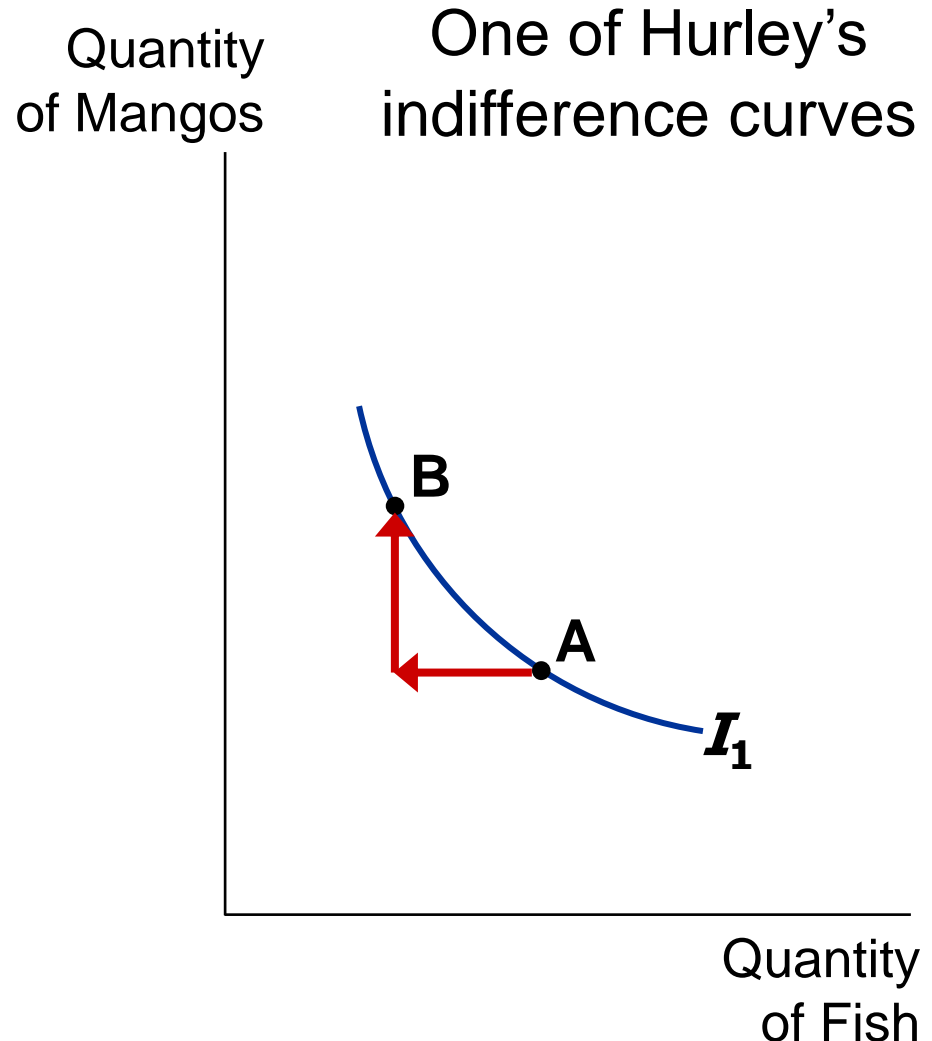
**A**, **B**, and all other bundles on  $I_1$  make Hurley equally happy – he is *indifferent* between them.



# 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.

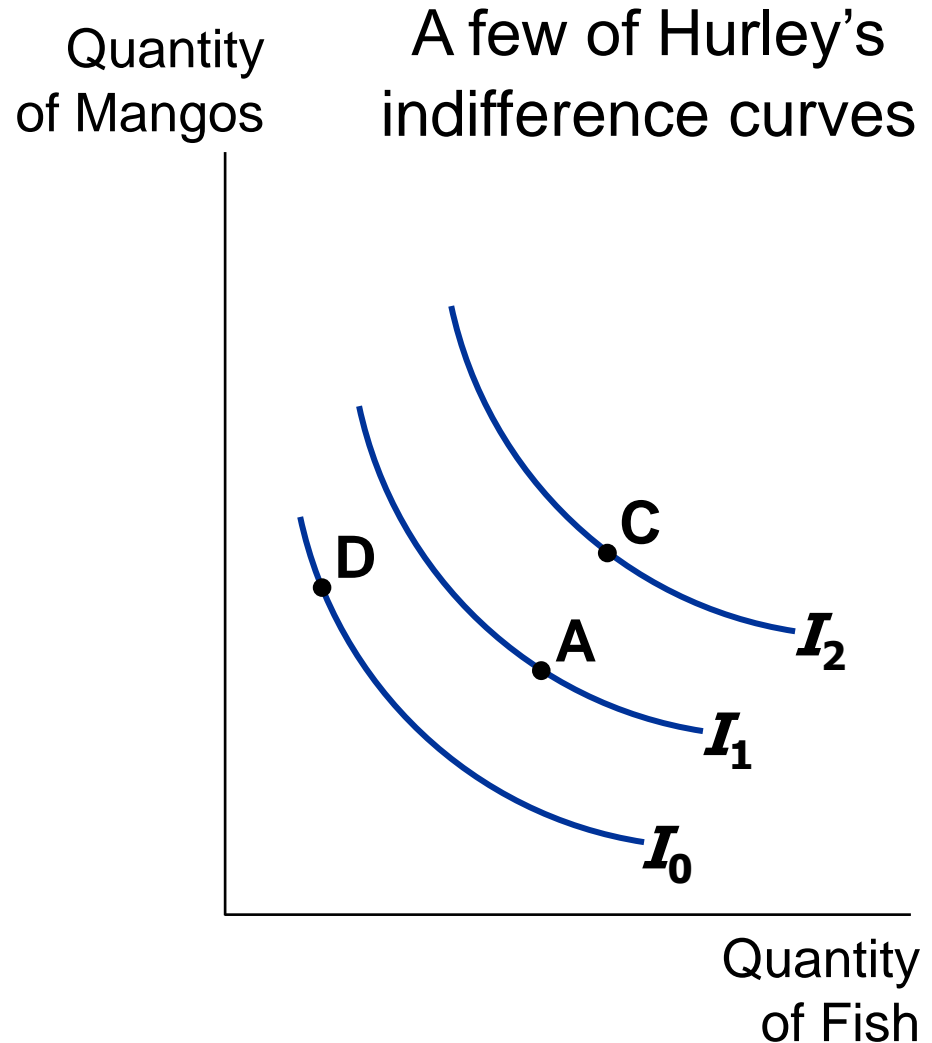


# Four Properties of Indifference Curves

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.

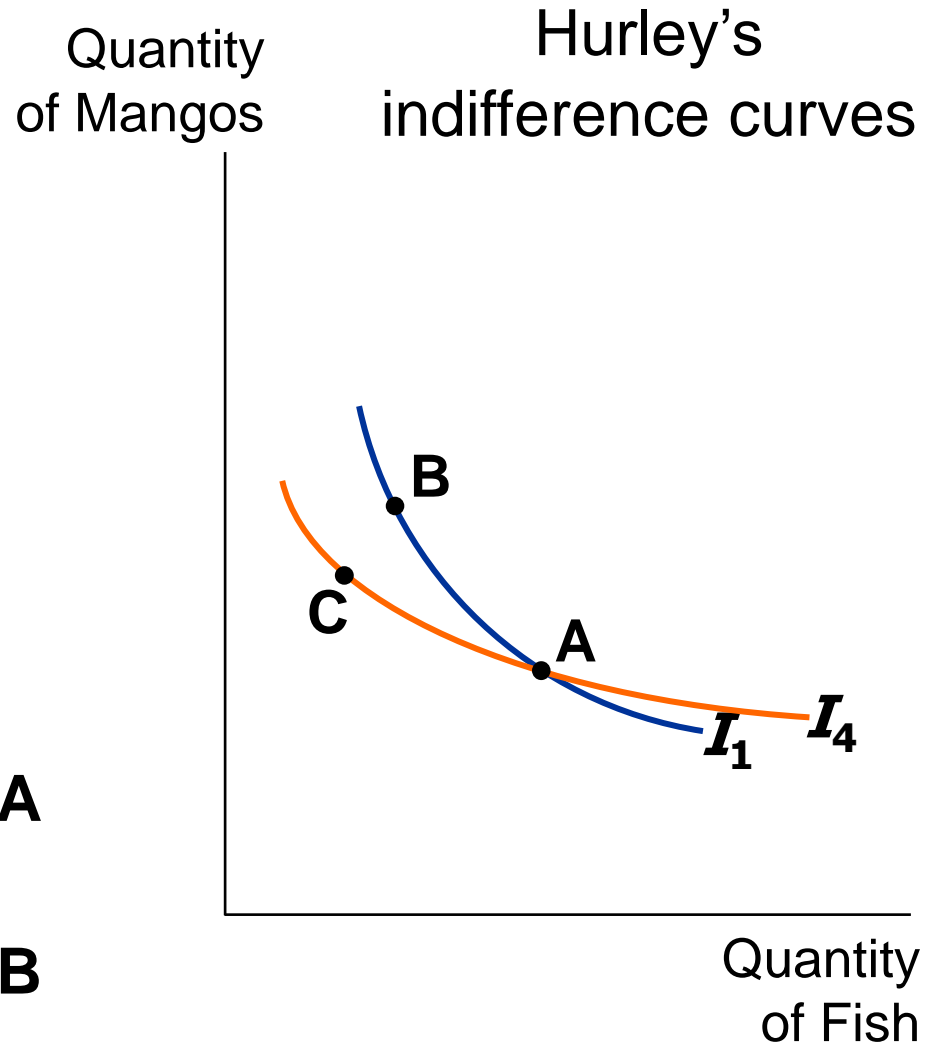
Suppose they did.

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  $I_4$ ).

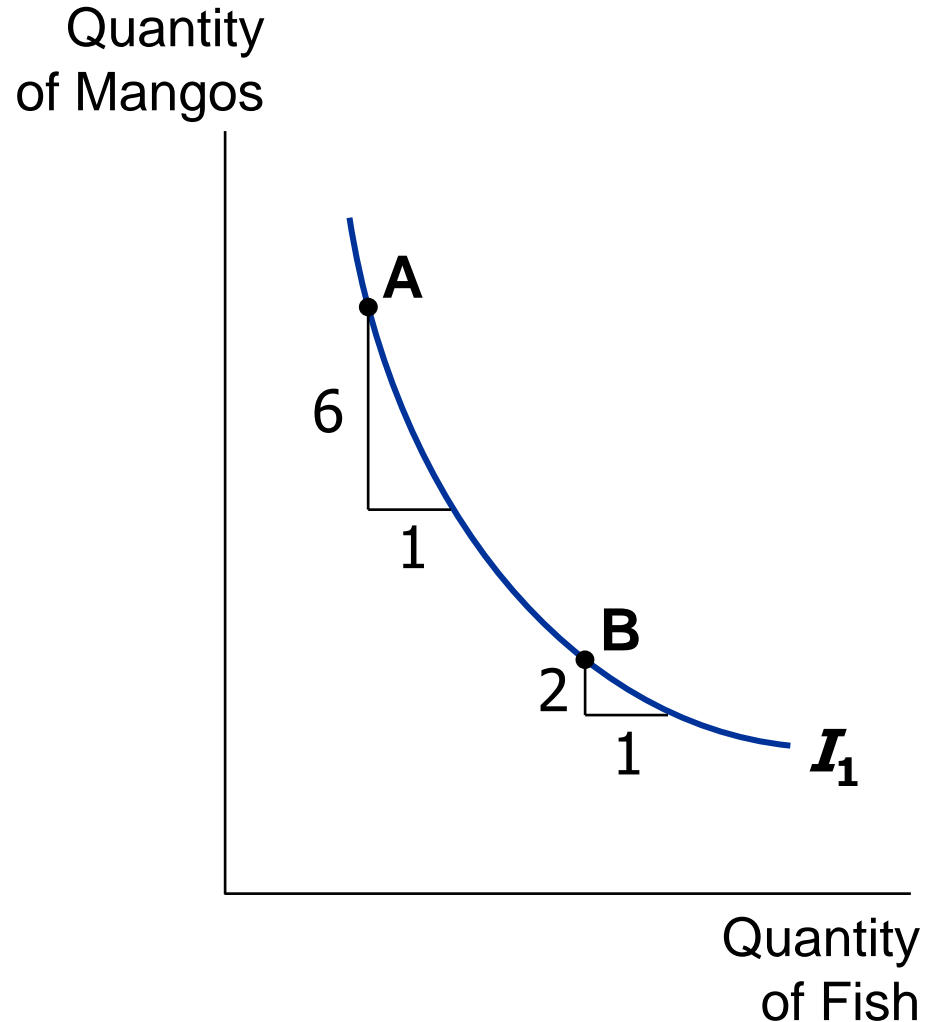
He likes **A** as much as **B** (both are on  $I_1$ ).



# Four Properties of Indifference Curves

## 4. Indifference curves are bowed inward.

Hurley is willing to give up more mangos 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):

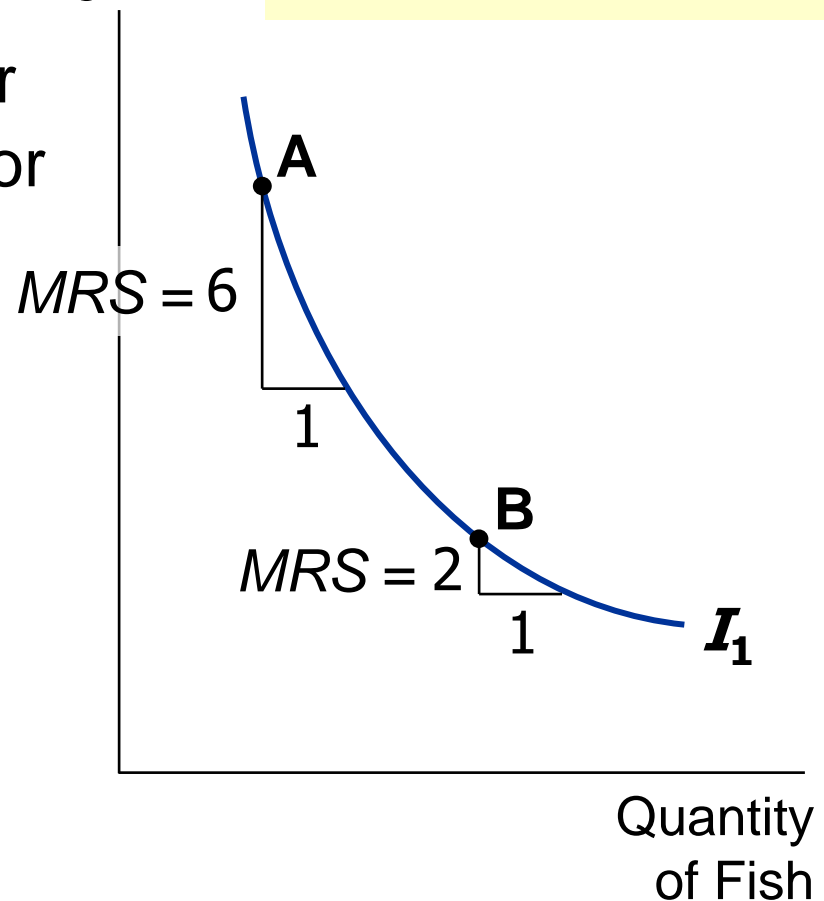
the rate at which a consumer is willing to trade one good for another.

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

MRS falls as you move down along an indifference curve.

Quantity  
of Mangos

*MRS = slope of  
indifference curve*

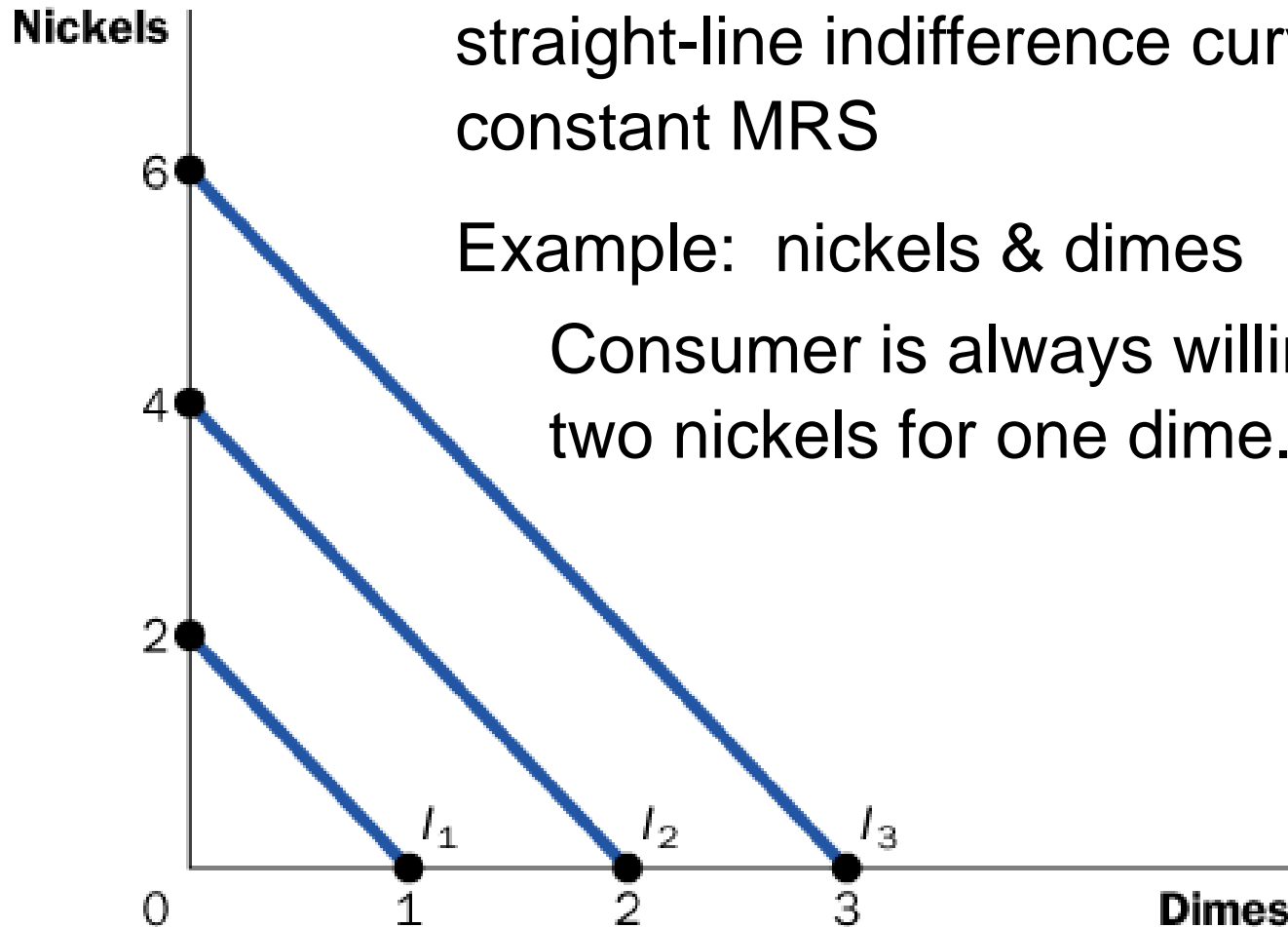


# One Extreme Case: Perfect Substitutes

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

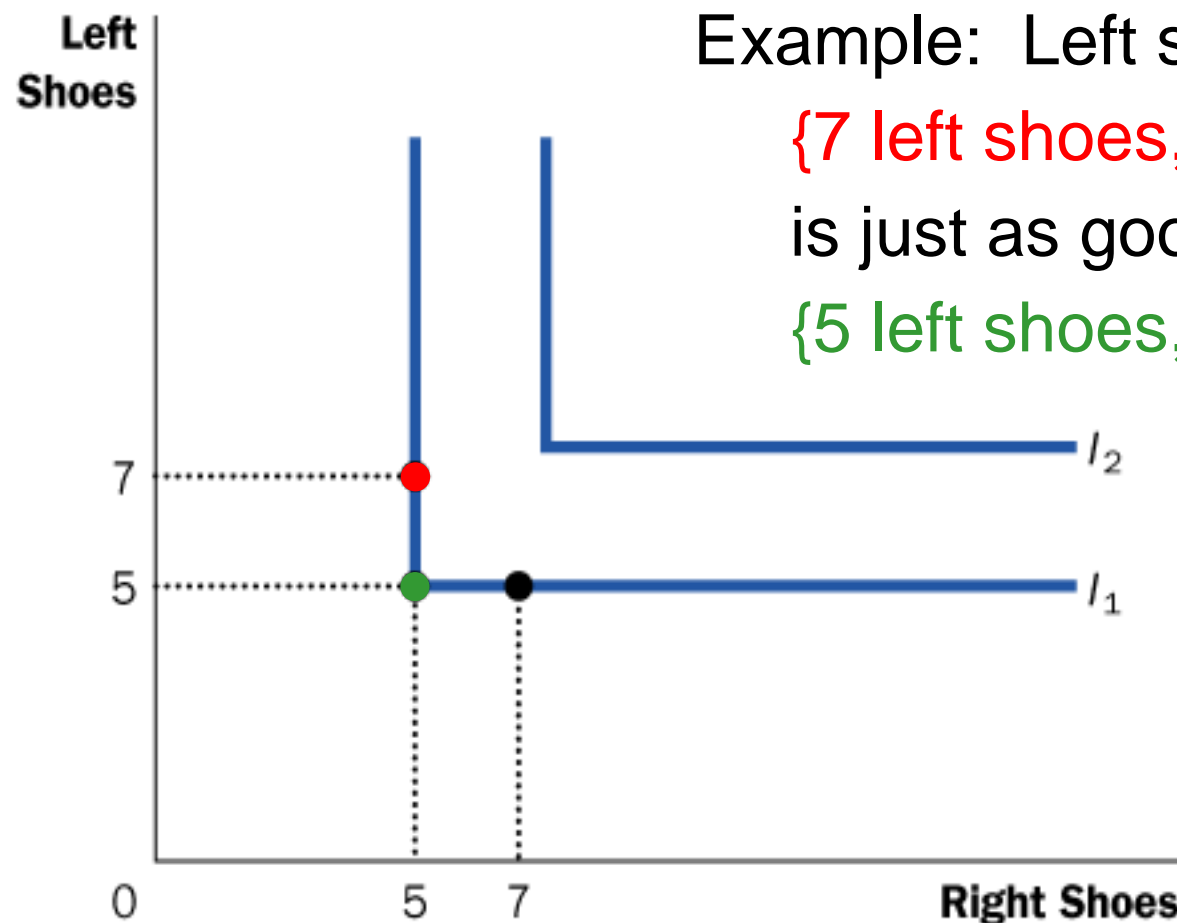
Example: nickels & dimes

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

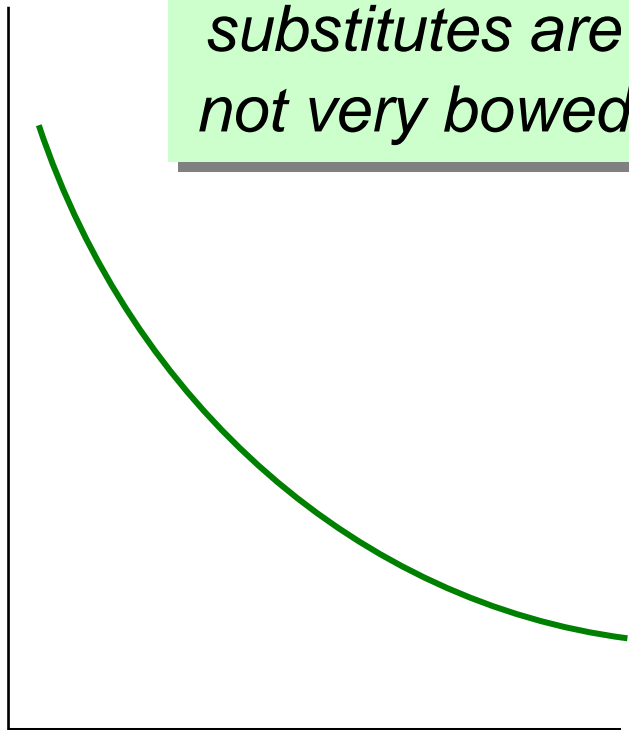
{5 left shoes, 5 right shoes}

"L Shape" or "Right Angle"

# Less Extreme Cases: Close Substitutes and Close Complements

Quantity  
of Pepsi

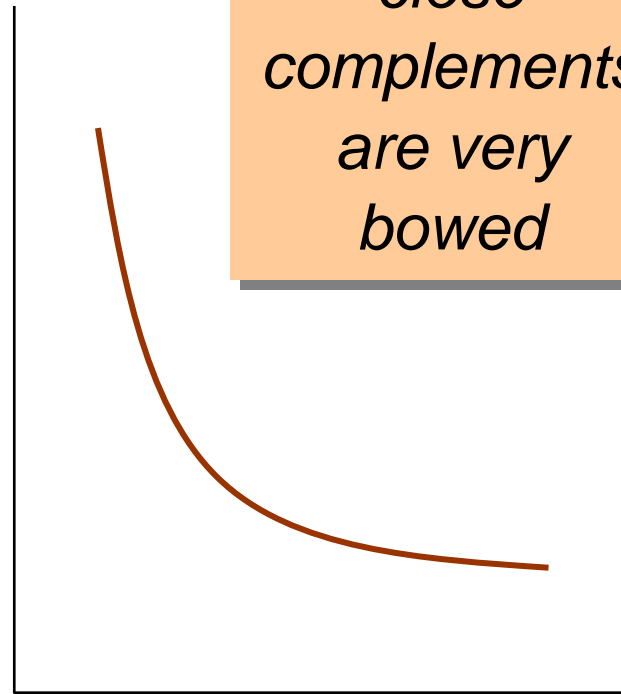
*Indifference  
curves for close  
substitutes are  
not very bowed*



Quantity  
of Coke

Quantity  
of hot  
dog buns

*Indifference  
curves for  
close  
complements  
are very  
bowed*



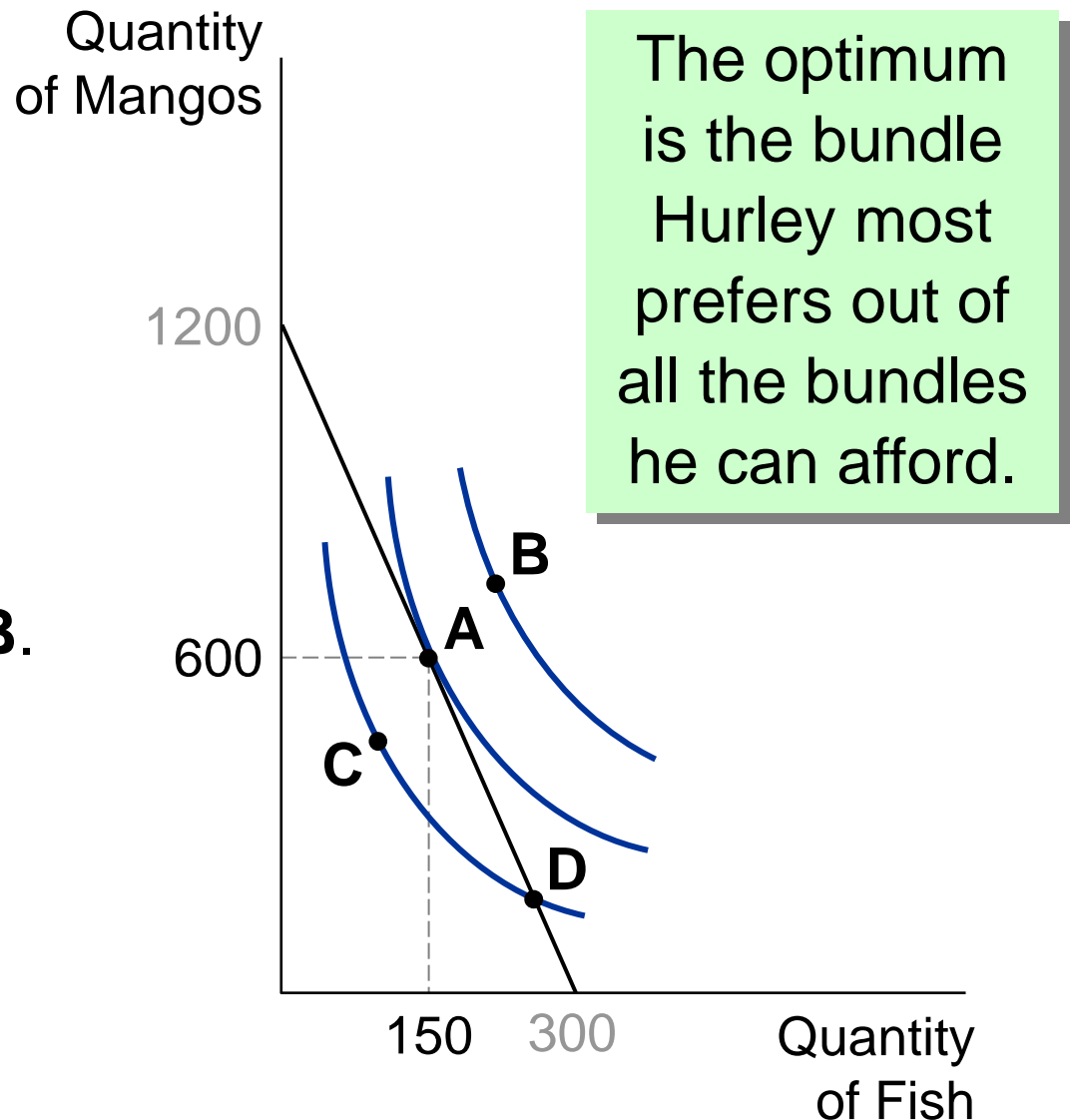
Quantity  
of hot dogs

# 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.



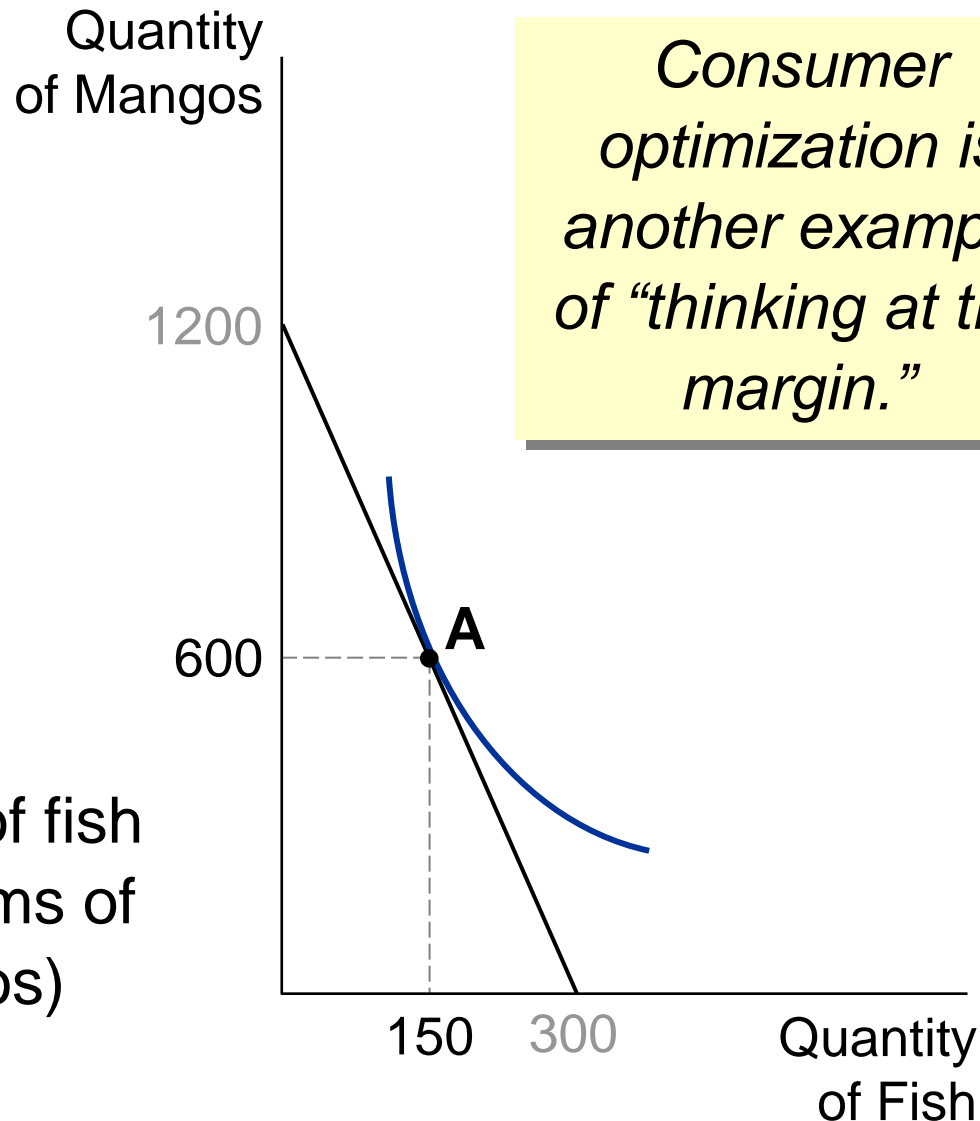
# Optimization: What the Consumer Chooses

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

$$MRS = P_F / P_M$$

marginal  
value of fish  
(in terms of  
mangos)

price of fish  
(in terms of  
mangos)

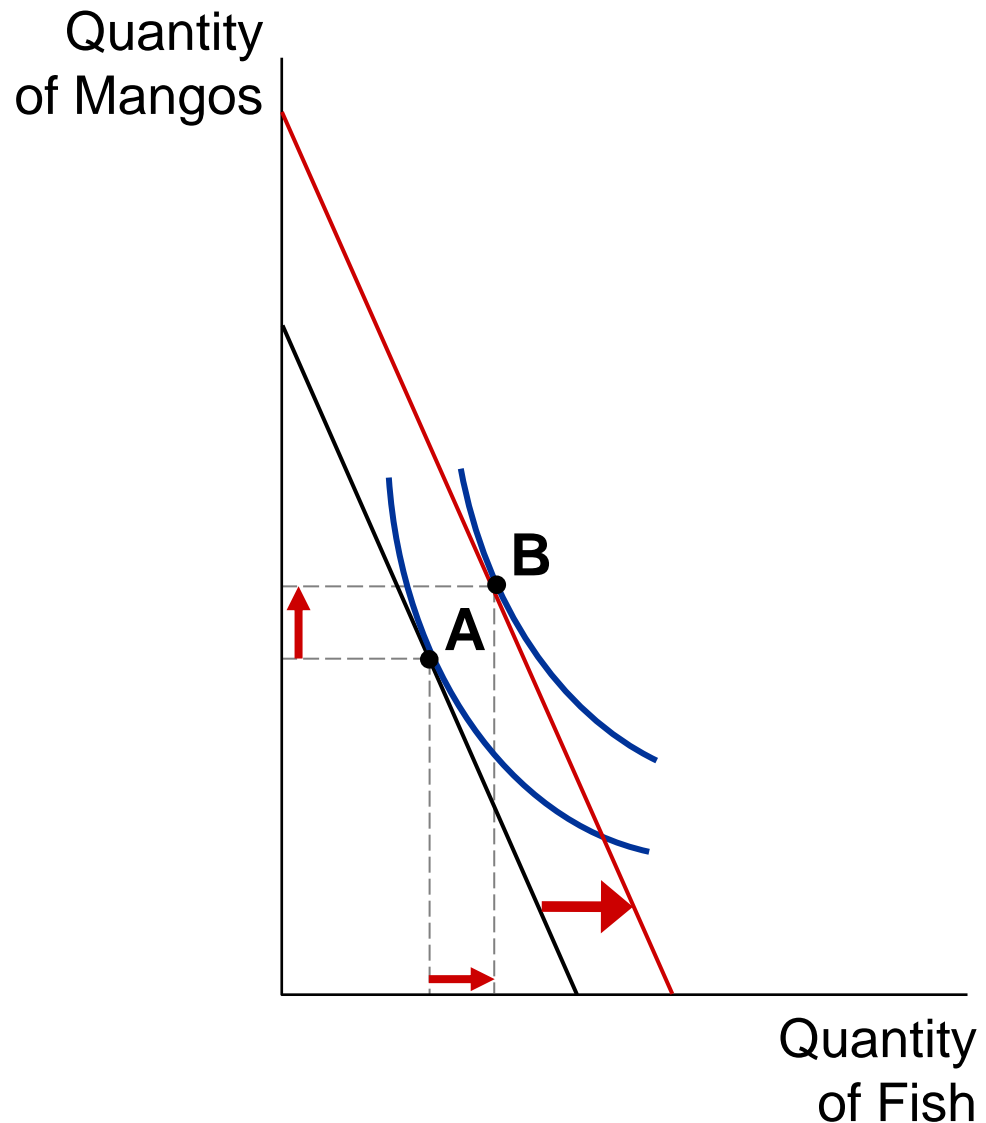


*Consumer optimization is another example of “thinking at the margin.”*

# 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

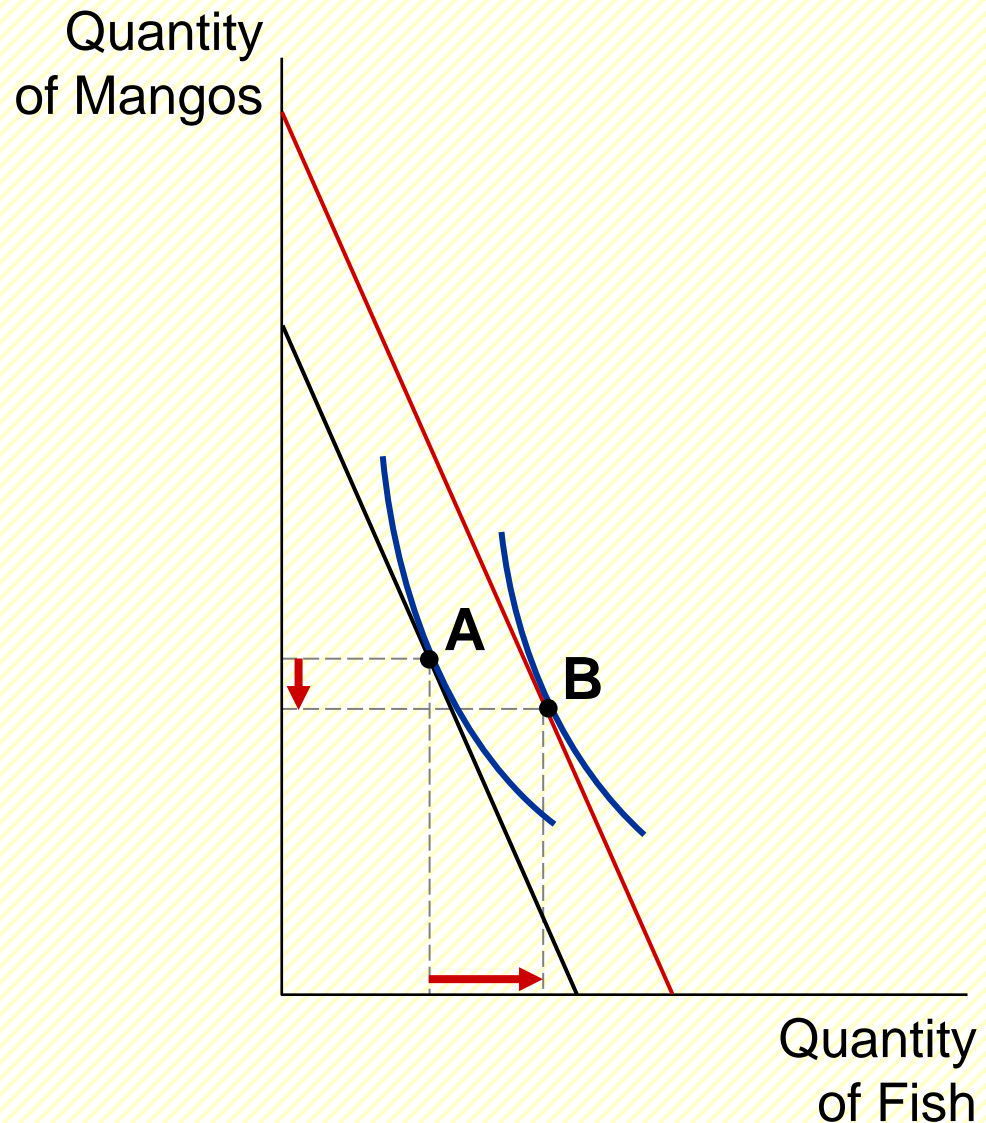
- An increase in income increases the quantity demanded of **normal goods** and reduces the quantity demanded of **inferior goods**.
- Suppose fish is a normal good but mangos are an inferior good.
- Use a diagram to show the effects of an increase in income on Hurley's optimal bundle of fish and mangos.



# ACTIVE LEARNING 3

## Answers

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



# The Effects of a Price Change

Initially,

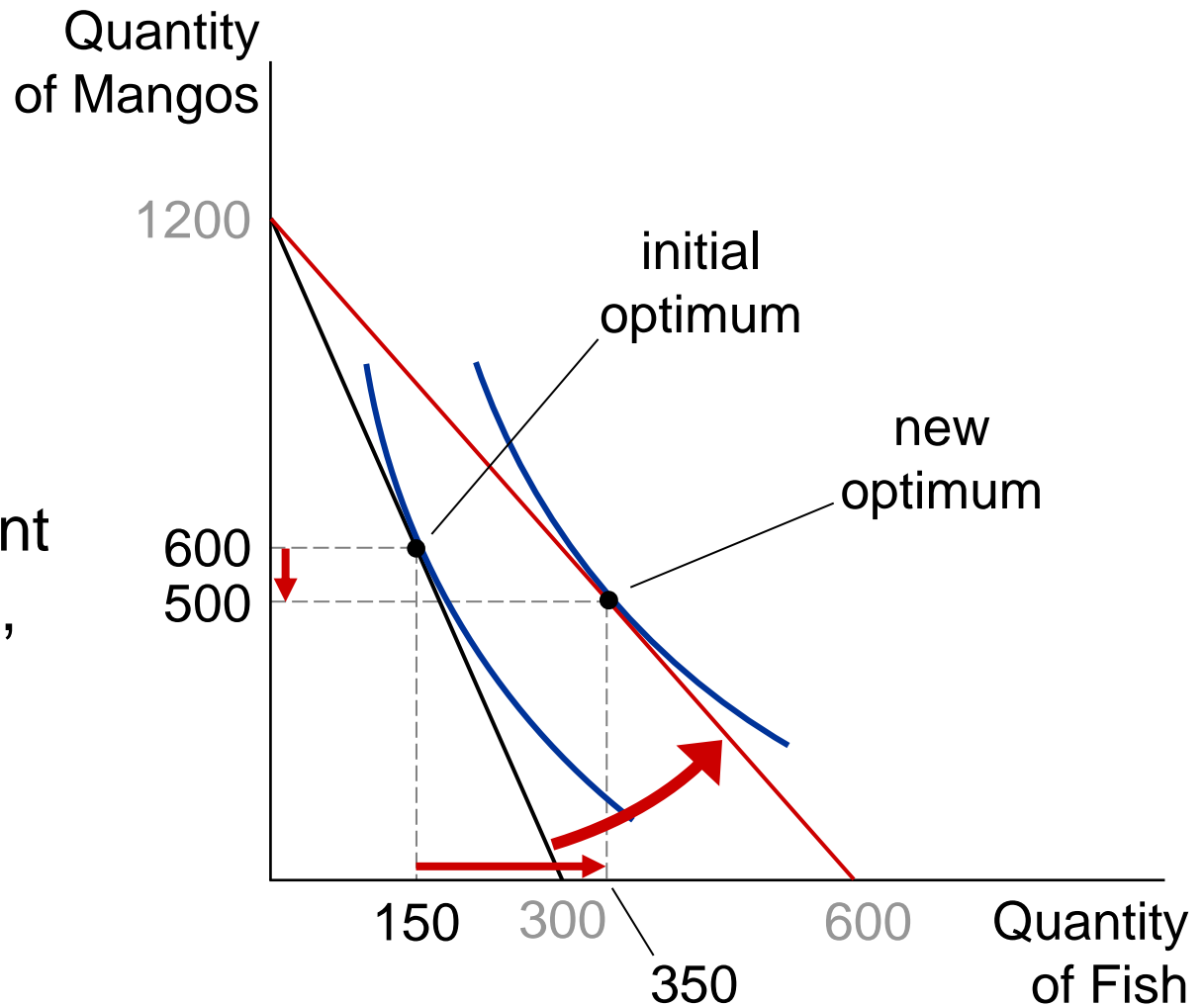
$$P_F = \$4$$

$$P_M = \$1$$

$P_F$  falls to \$2

budget constraint rotates outward,

Hurley buys more fish and fewer mangos.



# 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 mangos and more fish.

- **Substitution effect**

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

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

# The Income and Substitution Effects

Initial optimum at **A**.

Quantity of Mangos

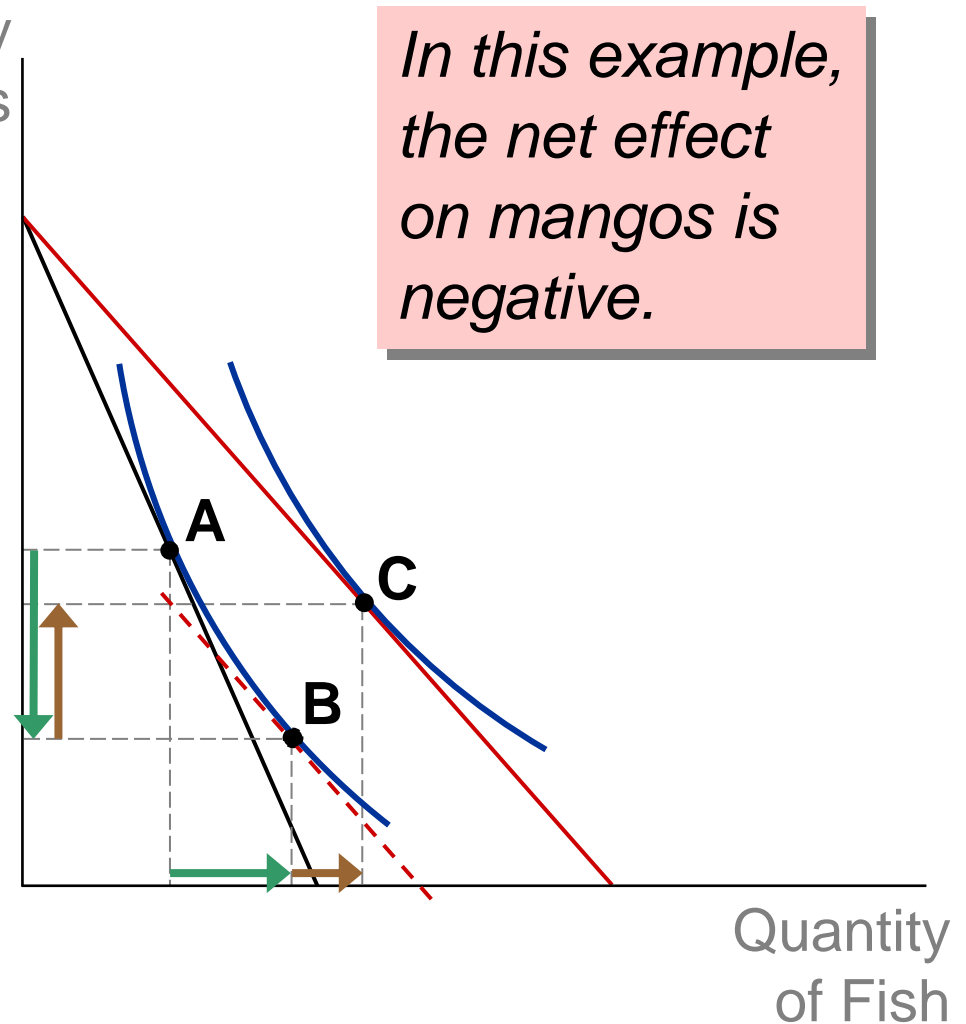
$P_F$  falls.

**Substitution effect:**

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

**Income effect:**

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



# CONCLUSION:

## *Do People Really Think This Way?*

- People do not make spending decisions by writing down their budget constraints and indifference curves.
- Yet, they try to make the choices that maximize their satisfaction given their limited resources.
- The theory in this chapter is only intended as a metaphor for how consumers make decisions.
- It explains consumer behavior fairly well in many situations and provides the basis for more advanced economic analysis.