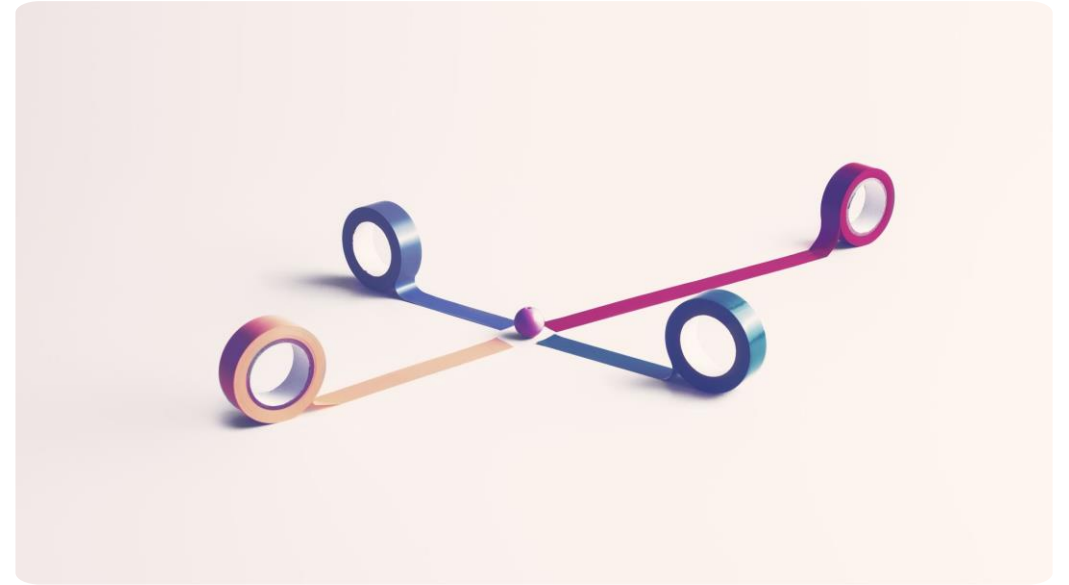


# Indifference Curve , Budget Constraints and Consumers Equilibrium

by  
Abdhut Deheri



# ASSUMPTIONS ABOUT CONSUMER PREFERENCES

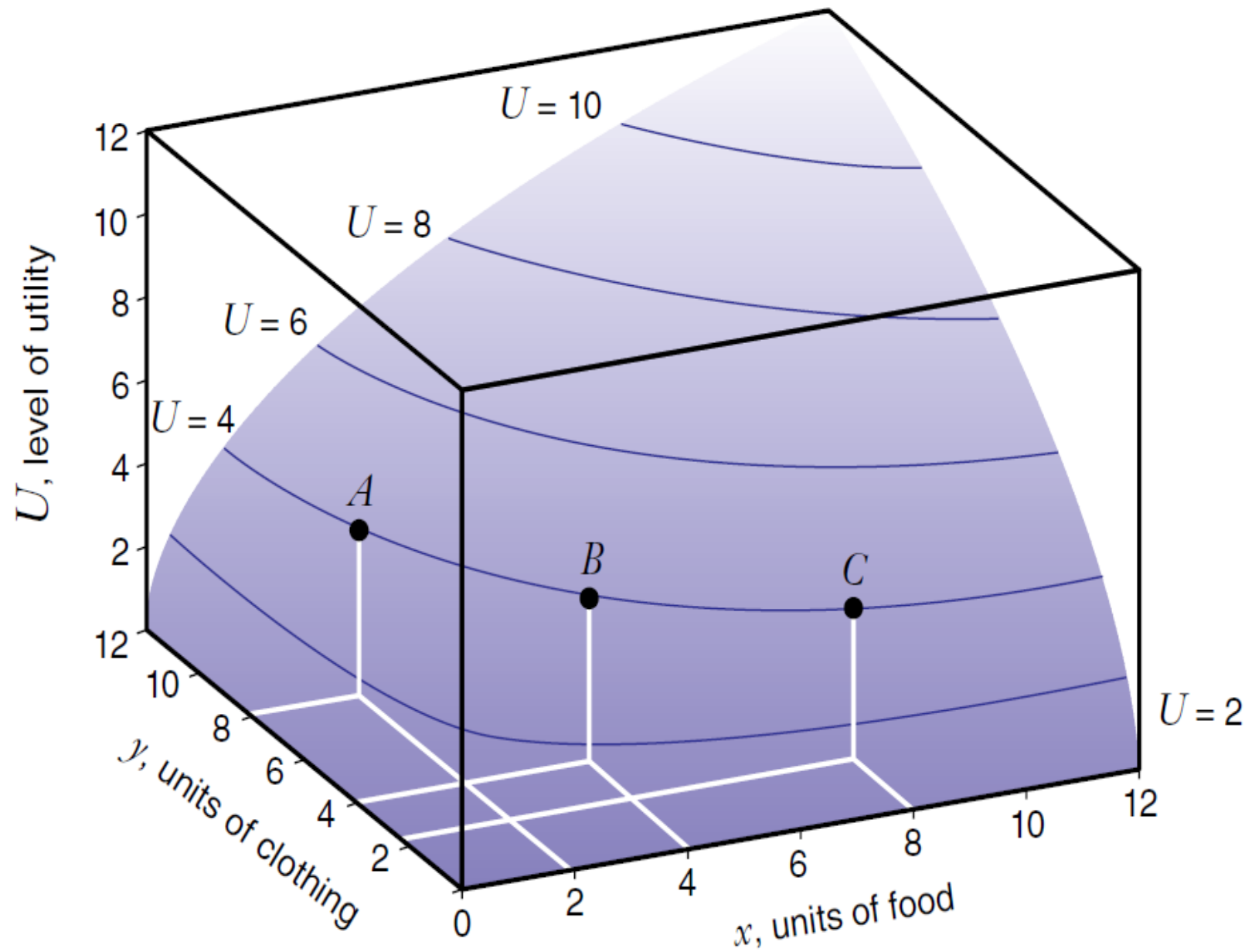
**1. *Preferences are complete:*** That is, the consumer is able to rank any two baskets. For baskets  $A$  and  $B$ , for example, the consumer can state her preferences according to one of the following possibilities:

**2. *Preferences are transitive:*** By this we mean that the consumer makes choices that are consistent with each other. Suppose that a consumer tells us that she prefers basket  $A$  to basket  $B$ , and basket  $B$  to basket  $E$ . We can then expect her to prefer basket  $A$  to basket  $E$ . Using the notation, we have just introduced to describe preferences, we can represent transitivity as follows: If  $A \succ B$  and if  $B \succ E$ , then  $A \succ E$ .

**3. *More is better.***

# What is Indifference Curve?

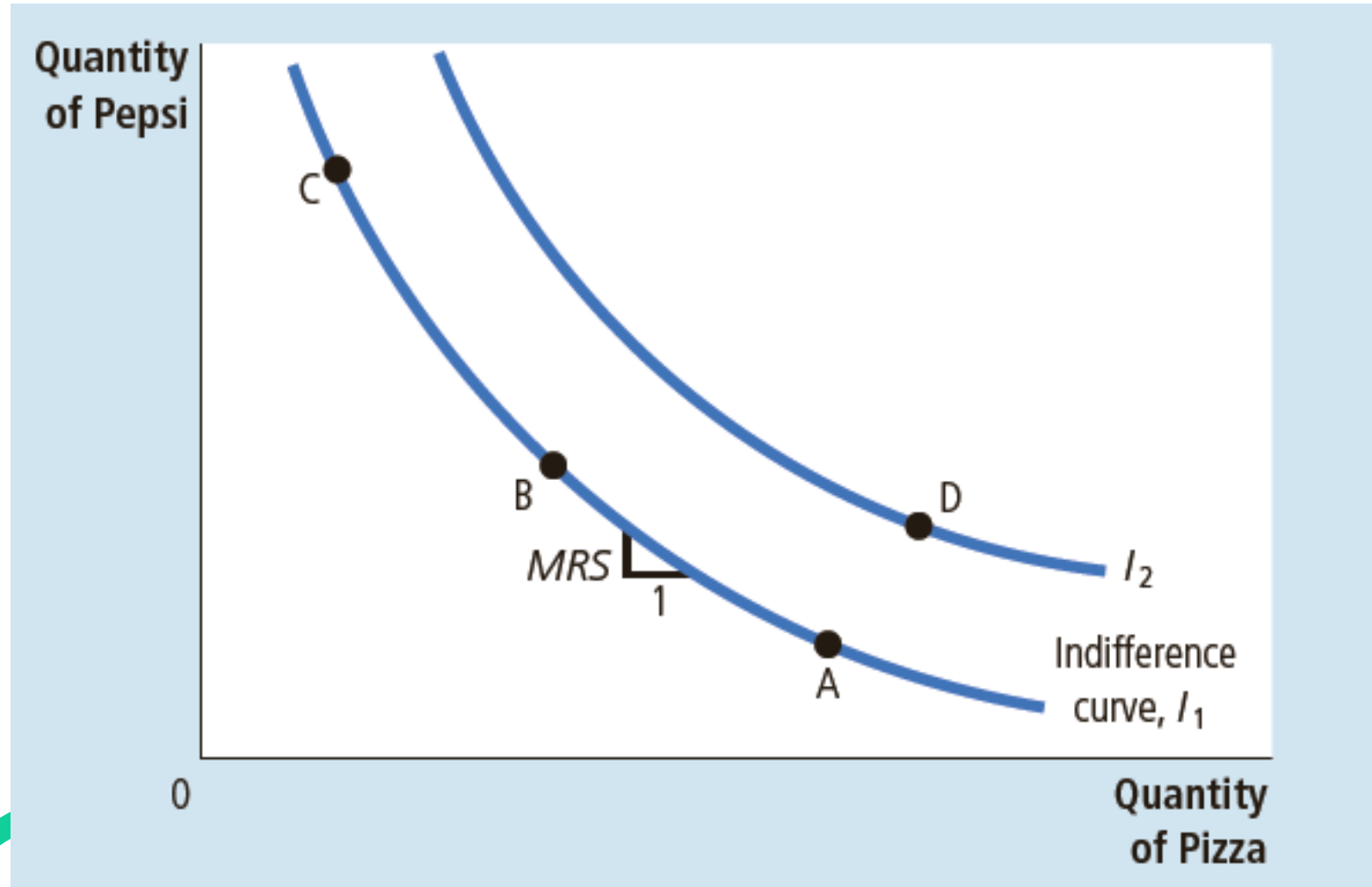
- If you offer the consumer two different bundles, she chooses the bundle that best suits her tastes. If the two bundles suit her tastes equally well, we say that the consumer is *indifferent* between the two bundles.
- An **indifference curve** shows the various bundles of consumption that make the consumer equally happy.



**FIGURE 3.4** Graph of the Utility Function  $U = \sqrt{xy}$

The level of utility is shown on the vertical axis, and the amounts of food ( $x$ ) and clothing ( $y$ ) are shown, respectively, on the right and left axes. Contours representing lines of constant utility are also shown. For example, the consumer is indifferent between baskets A, B, and C because they all yield the same level of utility ( $U = 4$ ).

# Indifference Curve and Map



## Indifference curve:

A curve that shows consumption bundles that give the consumer the same level of satisfaction.

# Slope of Indifference Curve

**Marginal rate of substitution:** The rate at which a consumer is willing to trade one good for another.

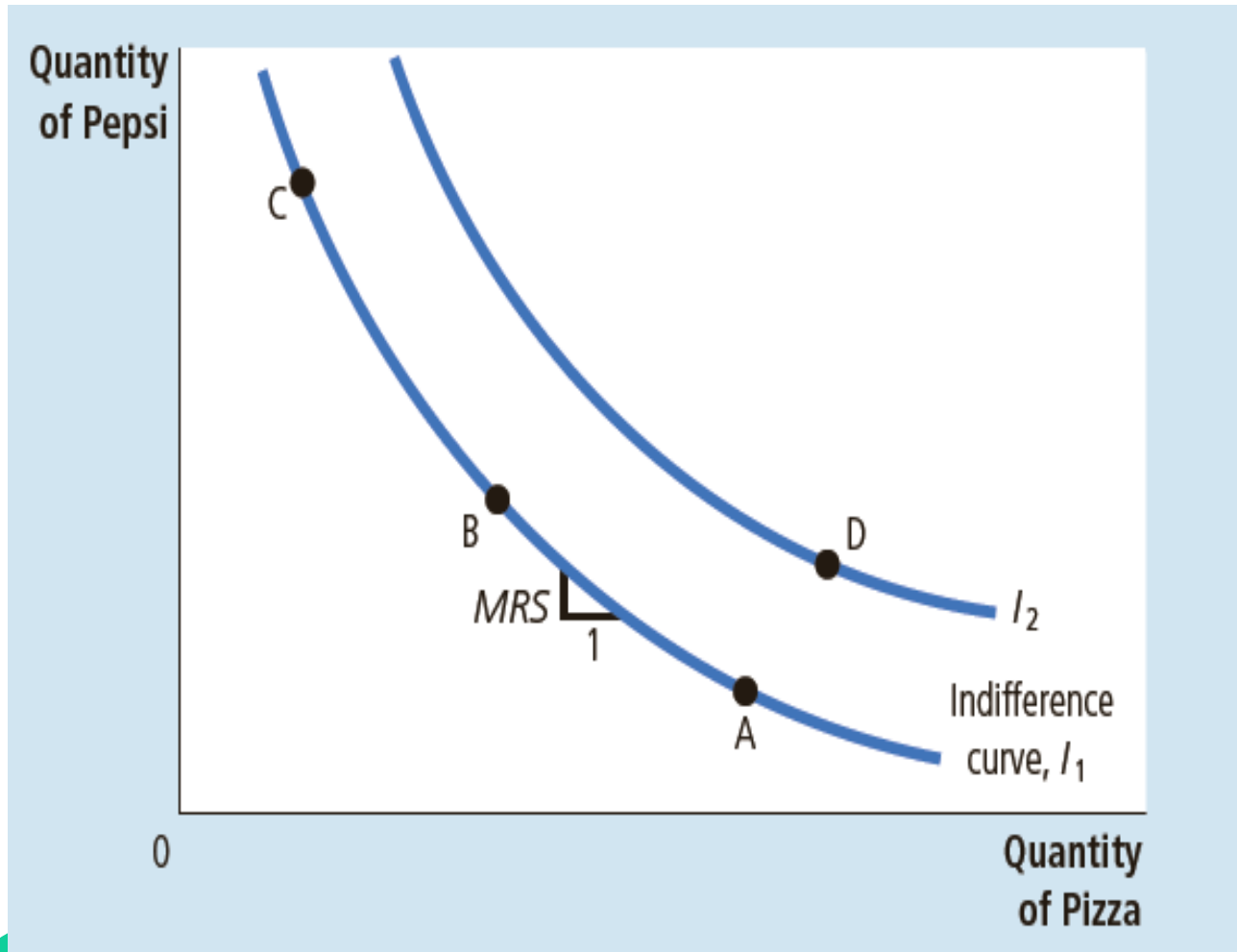
- *Marginal rate of substitution (MRS)* =  $-\frac{\text{Marginal Utility (MU)}_x}{\text{Marginal Utility (MU)}_y}$

$$\text{Slope of Indifference Curve} = MRS = -\frac{MU_{\text{Pizza}}}{MU_{\text{Pepsi}}}$$

# Four Properties of Indifference Curves

- *Property 1: Higher indifference curves are preferred to lower ones.*
- *Property 2: Indifference curves are downward-sloping.*
- *Property 3: Indifference curves do not cross.*
- *Property 4: Indifference curves are bowed inward.*

*Property 1: Higher indifference curves are preferred to lower ones.*




People usually prefer to consume more rather than less. Higher indifference curves represent larger quantities of goods than lower indifference curves. Thus, the consumer prefers being on higher indifference curves.

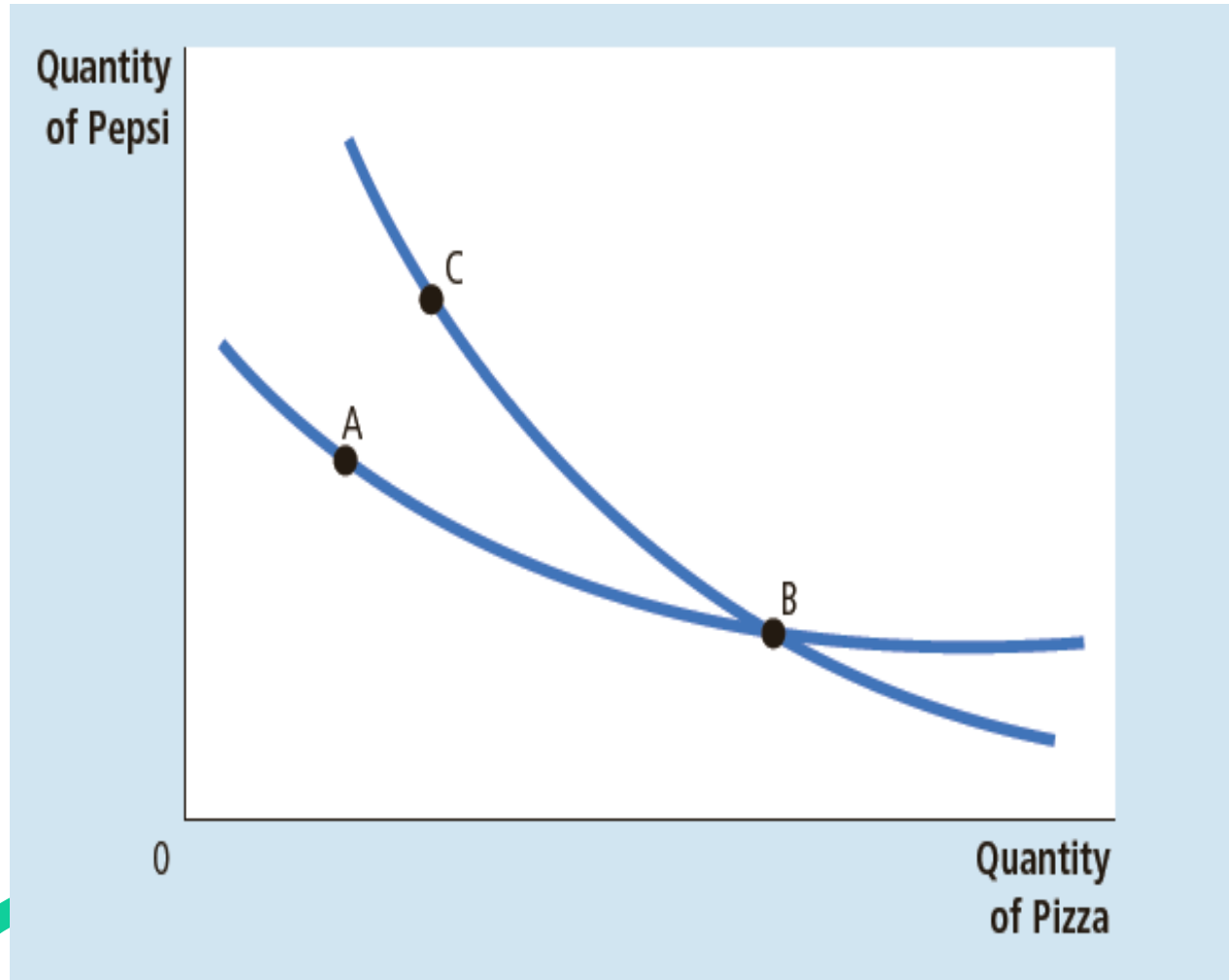




## *Property 2: Indifference curves are downward-sloping.*

- The slope of an indifference curve reflects the rate at which the consumer is willing to substitute one good for the other. In most cases, the consumer likes both goods.
  - Therefore, if the quantity of one good is reduced, the quantity of the other good must increase for the consumer to be equally happy. For this reason, most indifference curves slope downward.
- 

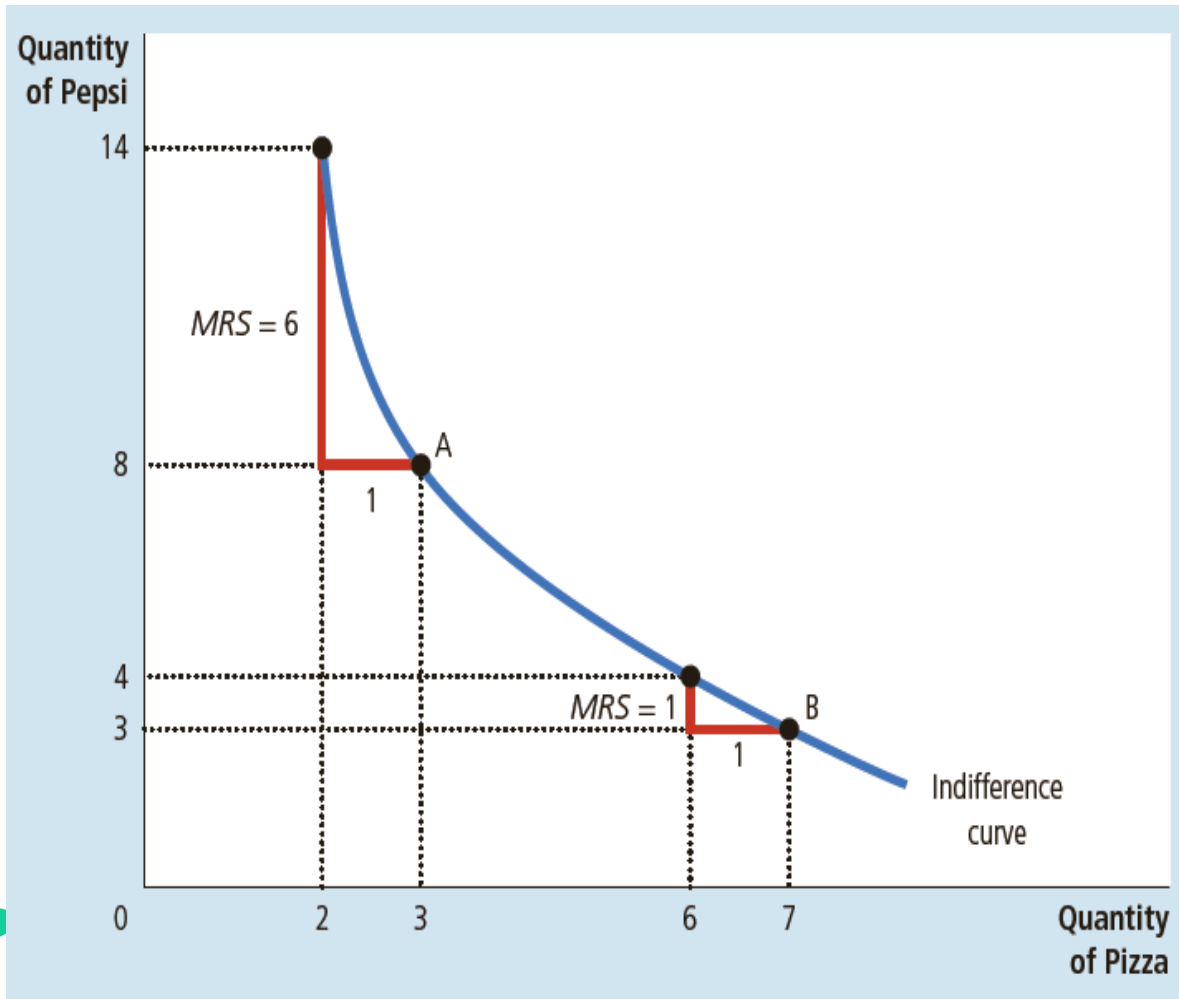
### *Property 3: Indifference curves do not cross.*



### **The Impossibility of Intersecting Indifference Curves**

A situation like this can never happen. According to these indifference curves, the consumer would be equally satisfied at points A, B, and C, even though point C has more of both goods than point A.


## *Property 4: Indifference curves are bowed inward*



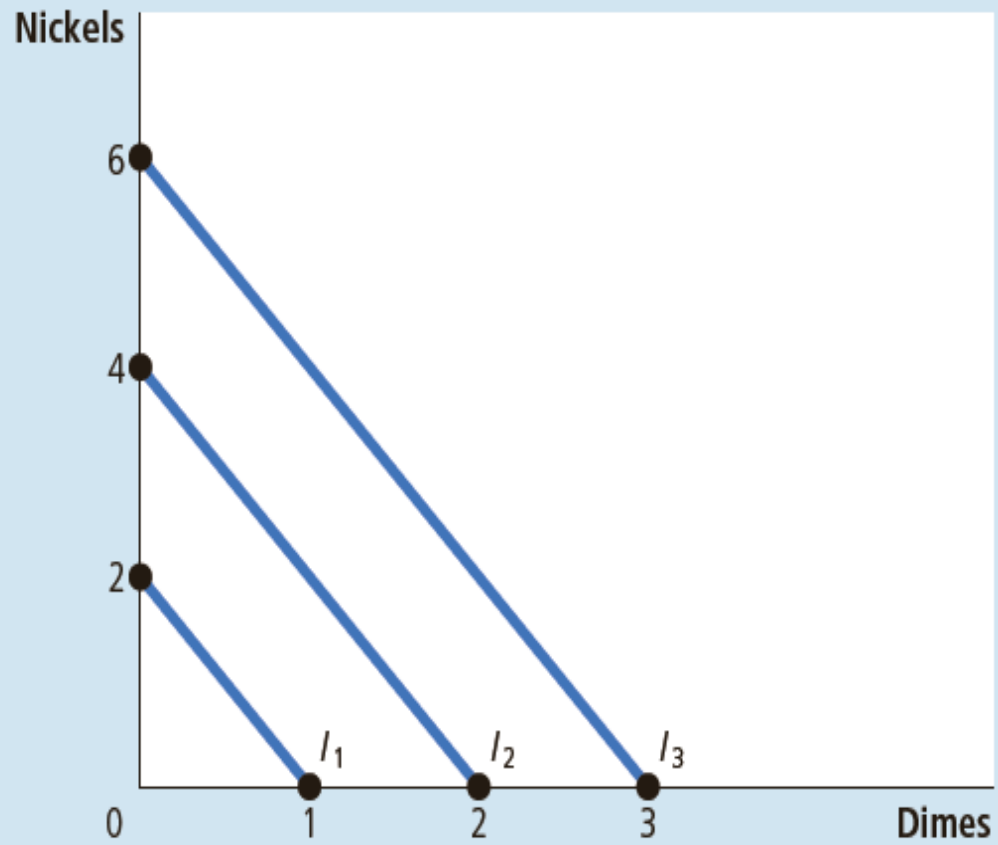
At point A, the consumer has a lot of Pepsi and only a little pizza, she is very hungry but not very thirsty. To induce the consumer to give up 1 pizza, she has to be given 6 liters of Pepsi: By contrast, at point B, the consumer has little Pepsi and a lot of pizza, so she is very thirsty but not very hungry. At this point, she would be willing to give up 1 pizza to get 1 liter of Pepsi: The  $MRS$  is 1 liter per pizza. Thus, the bowed shape of the indifference curve reflects the consumer's greater willingness to give up a good that she already has a lot of.



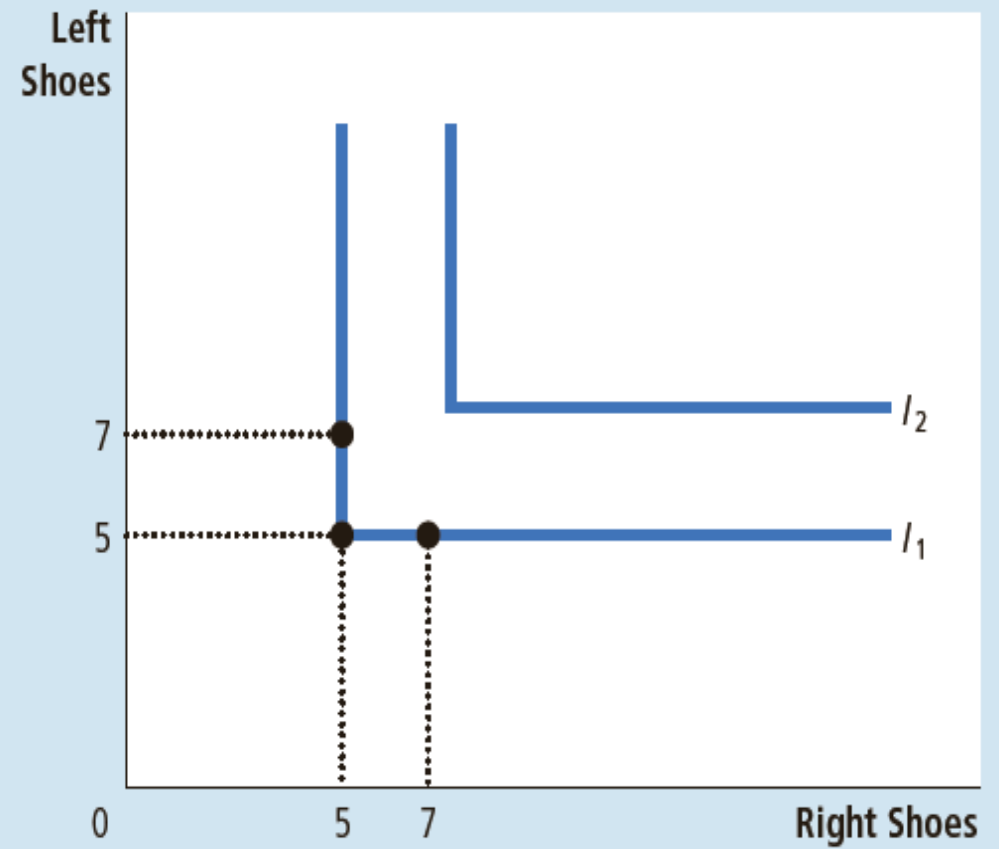
# Indifference curves for Perfect Substitutes and Perfect Complements goods

- When two goods are easily substitutable, such as nickels and dimes, the indifference curves are straight lines.
  - When two goods are strongly complementary, such as left shoes and right shoes, the indifference curves are right angles,
- 

(a) Perfect Substitutes



(b) Perfect Complements



# The Budget Constraint: What the Consumer Can Afford

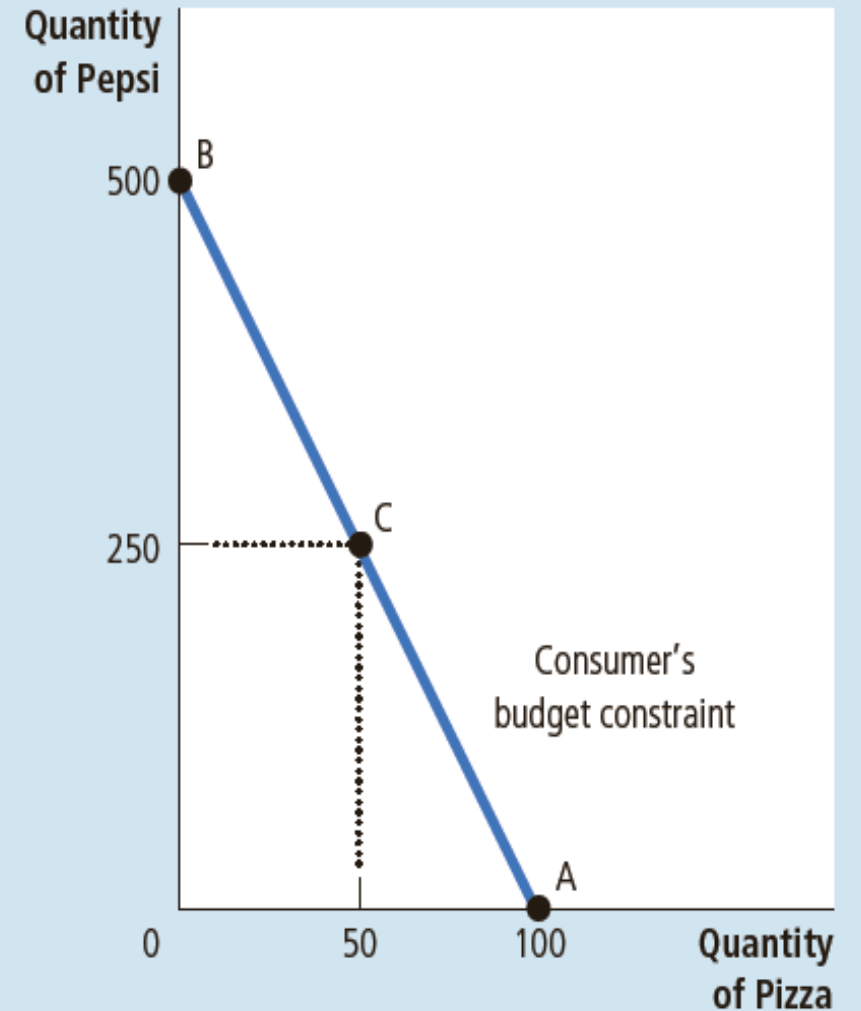
- People consume less than they desire because their spending is *constrained*, or limited, by their income.
- Suppose the consumer has an income of \$1,000 per month and spends her entire income on pizza and Pepsi. The price of a pizza is \$10, and the price of a liter of Pepsi is \$2.
- The budget constraint shows the various bundles of goods that the consumer can buy for a given income. Here the consumer buys bundles of pizza and Pepsi.

# The Budget Constraint

Price of Pizza=\$10, Price of Pepsi=\$2

Income=-\$1000

Number of Pizzas	Liters of Pepsi	Spending on Pizza	Spending on Pepsi	Total Spending
100	0	\$1,000	\$ 0	\$1,000
90	50	900	100	1,000
80	100	800	200	1,000
70	150	700	300	1,000
60	200	600	400	1,000
50	250	500	500	1,000
40	300	400	600	1,000
30	350	300	700	1,000
20	400	200	800	1,000
10	450	100	900	1,000
0	500	0	1,000	1,000



## Slope of Budget Constraint

$$\text{Slope of Budget Line} = -\frac{Price_x}{Price_y}$$

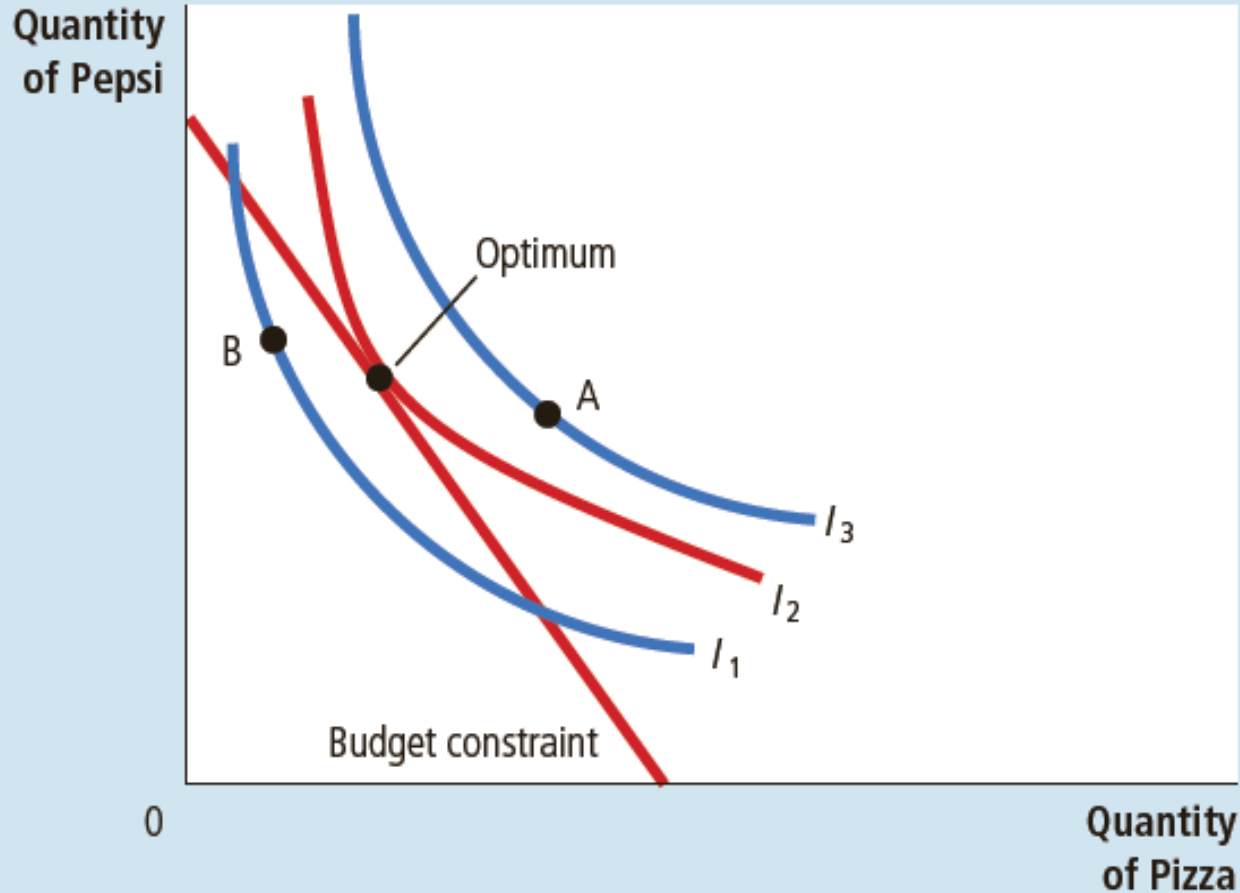
$$\text{Slope of Budget Line} = -\frac{Price_{pizza}}{Price_{pepsi}}$$



# Slope of Budget Constraint

- The slope of the budget constraint measures the rate at which the consumer can trade one good for the other. Recall that the slope between two points is calculated as the change in the vertical distance divided by the change in the horizontal distance (“rise over run”).
- From point A to point B, the vertical distance is 500 liters, and the horizontal distance is 100 pizzas. Thus, the slope is 5 liters per pizza. (Because the budget constraint slopes downward, the slope is a negative number. But for our purposes we can ignore the minus sign.)
- The slope of the budget constraint equals the *relative price* of the two goods—the price of one good compared to the price of the other. A pizza costs five times as much as a liter of Pepsi, so the opportunity cost of a pizza is 5 liters of Pepsi. The budget constraint’s slope of 5 reflects the trade-off the market is offering the consumer: 1 pizza for 5 liters of Pepsi.

# Consumers Equilibrium



The point at which this indifference curve and the budget constraint touch is called the *optimum*. The consumer would prefer point A, but she cannot afford that point because it lies above her budget constraint. The consumer can afford point B, but that point is on a lower indifference curve and, therefore, provides the consumer less satisfaction.

*At the point of equilibrium*

*Slope of Indifference Curve* = Slope of the budget line

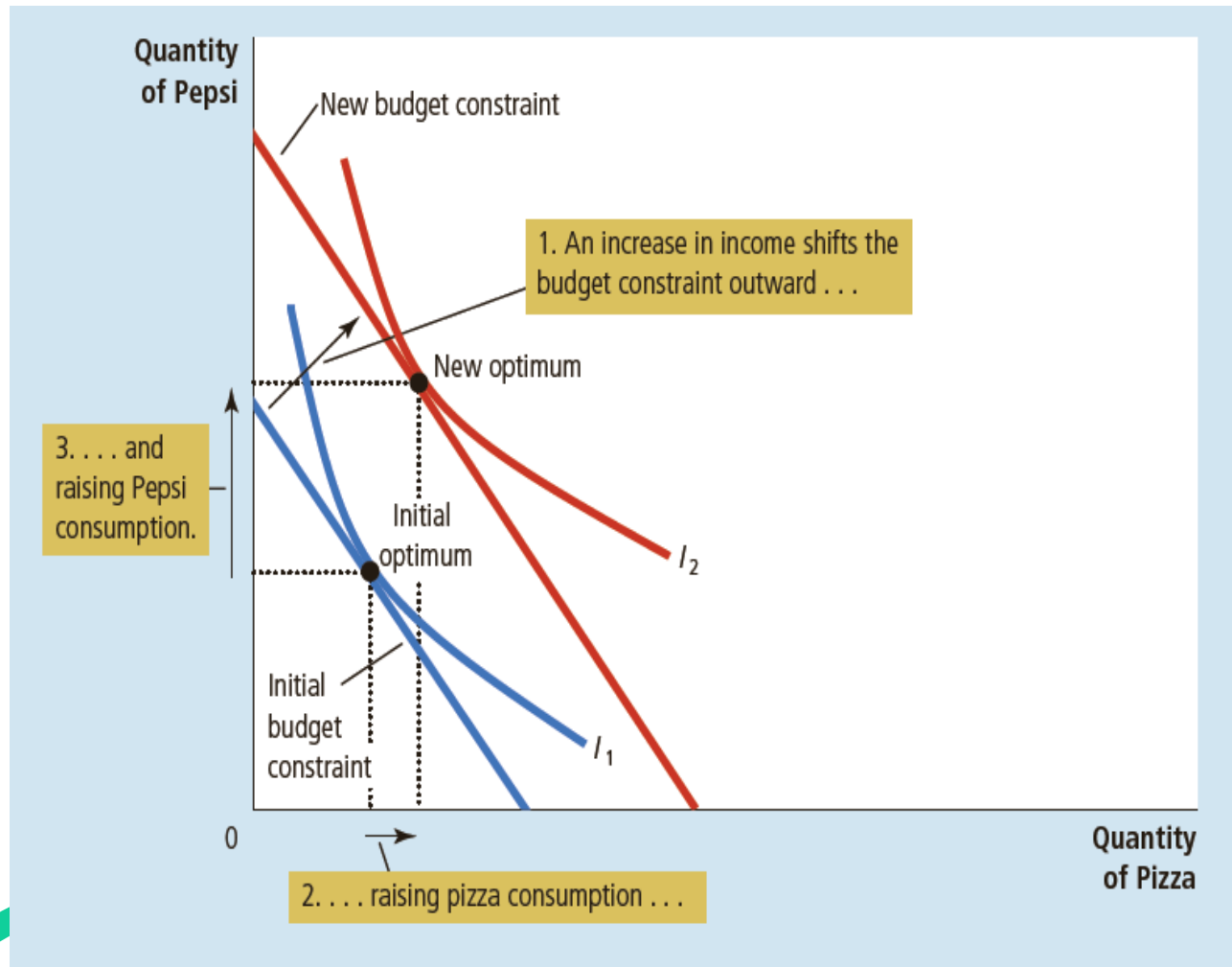
$$-\frac{\text{Marginal Utility (MU)}_x}{\text{Marginal Utility (MU)}_y} = -\frac{\text{Price}_x}{\text{Price}_y}$$

$$-\frac{MU_{\text{Pizza}}}{MU_{\text{Pepsi}}} = -\frac{\text{Price}_{\text{Pizza}}}{\text{Price}_{\text{Pepsi}}}$$

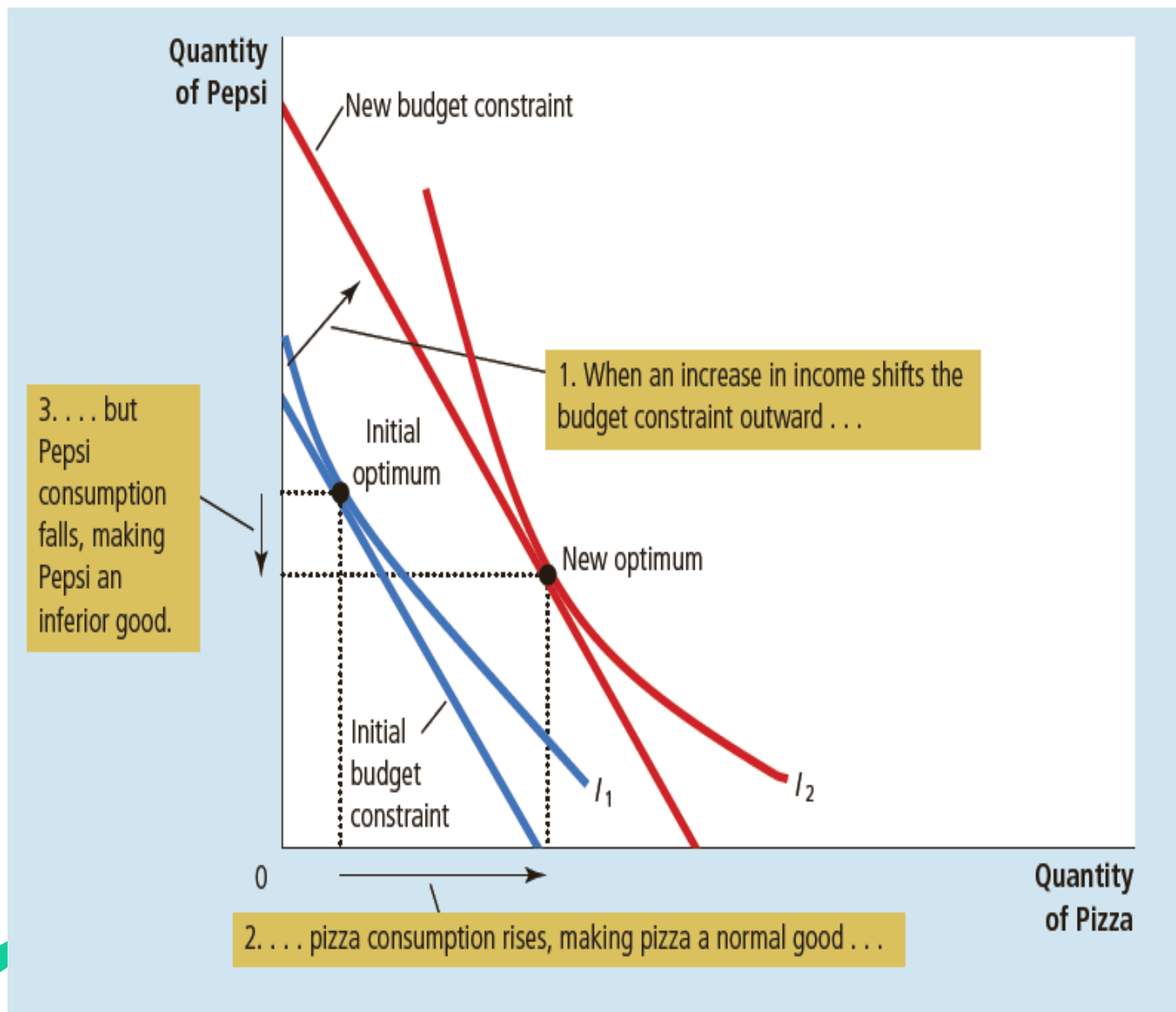
## Numerical Problem

- Eric purchases food (measured by  $x$ ) and clothing (measured by  $y$ ) and has the utility function and has utility Function:  
 $U(x, y) = xy$ . He has a monthly income of \$800. The price of food is  $P_x = \$20$ , and the price of clothing is  $P_y = \$40$ . Find out the optimal consumption bundle?

## How Changes in Income Affect the Consumer's Choices

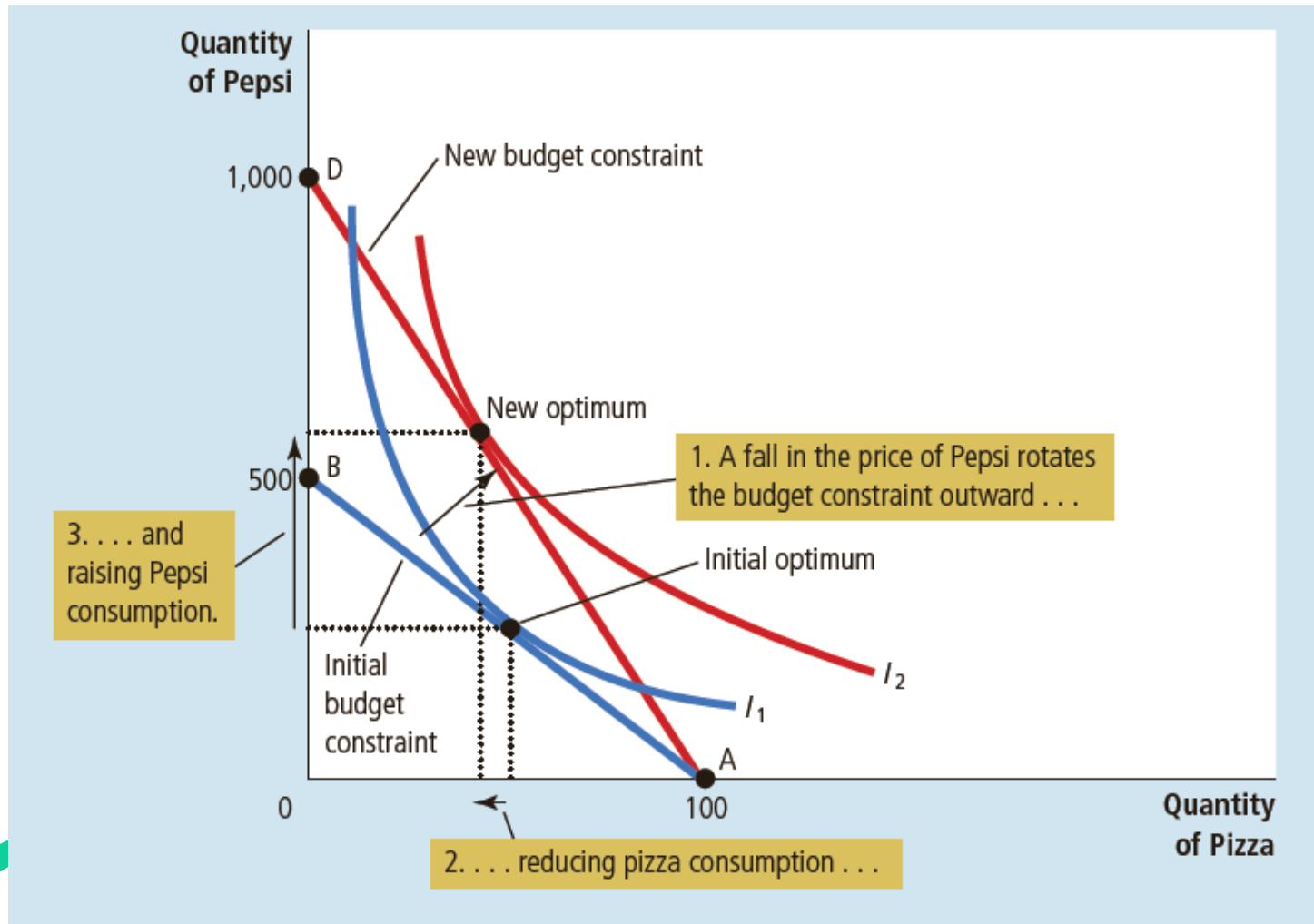


When the consumer's income rises, the budget constraint shifts outward. If both goods are normal goods, the consumer responds to the increase in income by buying more of both of them. Here the consumer buys more pizza and more Pepsi.



A good is inferior if the consumer buys less of it when her income rises. Here Pepsi is an inferior good: When the consumer's income increases and the budget constraint shifts outward, the consumer buys more pizza but less Pepsi.

# How Changes in Prices Affect the Consumer's Choices



When the price of Pepsi falls, the consumer's budget constraint shifts outward and changes slope. The consumer moves from the initial optimum to the new optimum, which changes her purchases of both pizza and Pepsi. In this case, the quantity of Pepsi consumed rises, and the quantity of pizza consumed falls.

Any  
Question?

