



Micro

McFachern

ECON

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CHAPTER

6

*Consumer Choice
and Demand*

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Utility Analysis

- **Utility**
 - **Satisfaction derived from consumption**
 - **Subjective**
- **Assumption**
 - **Tastes are given**
 - **Tastes are relatively stable**

“ Different people may have different tastes, but an individual's tastes are not constantly in flux. ”

The Law of Diminishing Marginal Utility

- Total utility
 - Total satisfaction
- Marginal utility
 - Change in total utility from one-unit change in consumption



The Law of Diminishing Marginal Utility

- The more of a good consumed
 - The smaller the increase in total utility
- Marginal utility from each additional unit
 - Declines as more is consumed
- Disutility
 - Negative marginal utility
- “Been there; done that”

LO¹

Measuring Utility

- **Units of utility**
- **Each person has a uniquely subjective utility scale**
- **Total utility**
 - **Sum of marginal utilities**

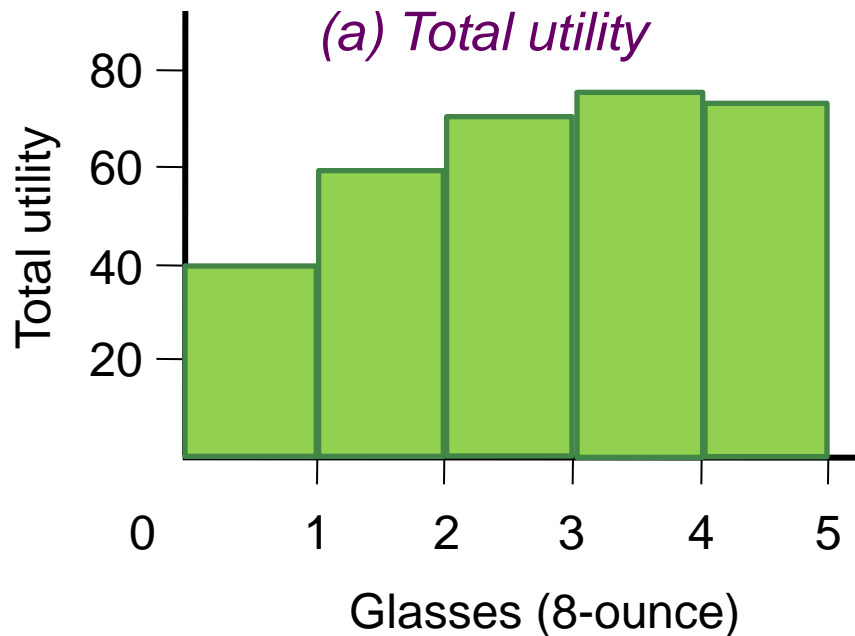


Utility Derived from Drinking Water After Jogging Four Miles

Amount Consumed (8-ounce glasses)	Total Utility	Marginal Utility
0	0	-
1	40	40
2	60	20
3	70	10
4	75	5
5	73	-2

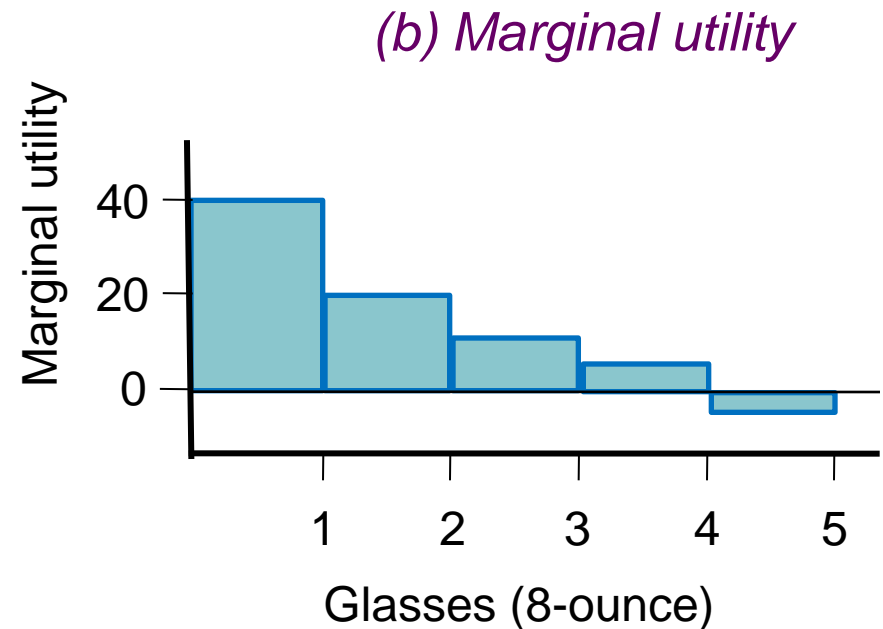
Exhibit 2

Total Utility and Marginal Utility You Derive from Drinking Water after Jogging Four Miles



Total utility increases with each of the first 4 glasses of water consumed but by smaller and smaller amounts

The 5th glass causes TU to fall



Marginal utility declines

MU of the 5th glass is negative

Utility Maximization Without Scarcity

- **Free good**
 - **Increase consumption as marginal utility is positive**
- **Two free goods**
 - **Until the marginal utility of each is 0**
- **Tastes, preferences**

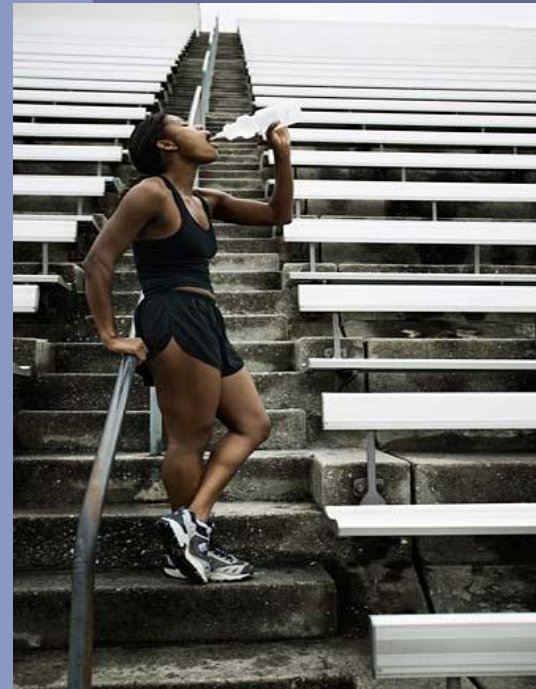


Exhibit 3

Total and Marginal Utilities from Pizza and Videos

Pizza				Video Rentals			
(1) Consumed per Week	(2) Total Utility	(3) Marginal Utility	(4) Marginal Utility per Dollar if $p = \$8$	(5) Viewed per Week	(6) Total Utility	(7) Marginal Utility	(8) Marginal Utility per Dollar if $p = \$4$
0	0	—	—	0	0	—	—
1	56	56	7	1	40	40	10
2	88	32	4	2	68	28	7
3	112	24	3	3	88	20	5
4	130	18	2¼	4	100	12	3
5	142	12	1½	5	108	8	2
6	150	8	1	6	114	6	1½



Utility Maximization With Scarcity

- Goods – not free
- Tastes, preferences
- Limited income
- Maximize utility
 - Equilibrium
 - Any affordable change will reduce utility



Utility-Maximizing Conditions

- **Equilibrium**
 - **There is no way to increase utility by reallocating the budget**
 - **Last \$ spent on each good yields the same marginal utility**
 - **Higher-priced goods must yield more marginal utility than lower-price goods**

$$\frac{MU_p}{P_p} = \frac{MU_v}{P_v}$$

Water, Water, Everywhere

- ◆ **Diamonds**
 - ◆ **Not a necessity; expensive; relatively scarce**
- ◆ **Water**
 - ◆ **Necessity; cheap; abundant**
- ◆ **Diamonds-Water paradox**
 - ◆ $TU_{\text{water}} > TU_{\text{diamonds}}$
 - ◆ **Last gallon of water MU_{water} very low**
 - ◆ **Last diamond MU_{diamond} high**
 - ◆ $P_{\text{diamond}} > P_{\text{water}}$



Exhibit 4

Total and Marginal Utilities from Pizza and Videos After the Price of Pizza Decreases from \$8 to \$6



Pizza

Video Rentals

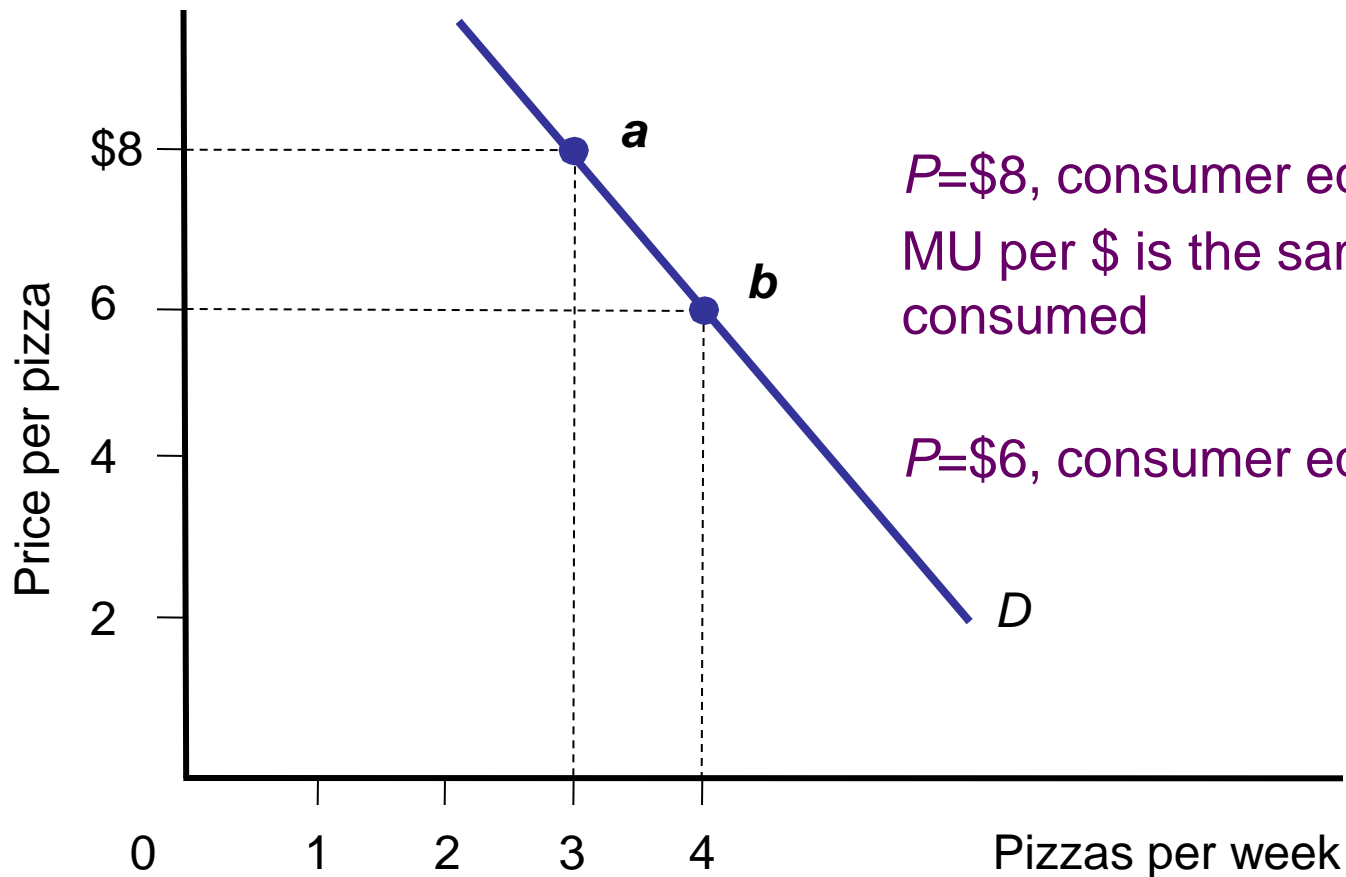
(1) Consumed per Week	(2) Total Utility	(3) Marginal Utility	(4) Marginal Utility per Dollar if $p = \$6$	(5) Viewed per Week	(6) Total Utility	(7) Marginal Utility	(8) Marginal Utility per Dollar if $p = \$4$
0	0	—	—	0	0	—	—
1	56	56	$9\frac{1}{3}$	1	40	40	10
2	88	32	$5\frac{1}{3}$	2	68	28	7
3	112	24	4	3	88	20	5
4	130	18	3	4	100	12	3
5	142	12	2	5	108	8	2
6	150	8	$1\frac{1}{2}$	6	114	6	$1\frac{1}{2}$

Marginal Utility and the Law of Demand

- Exhibit 3
 - Max U; budget = \$40
 - $Q_p = 3$; $P_p = \$8$; one point on D curve
 - $(Q_v = 4 ; P_v = \$4)$
- Price of pizza drops to \$6, other things constant
 - Max U; budget = \$40
 - $Q_p = 4$; $P_p = \$6$; second point on D curve
 - $(Q_v = 4 ; P_v = \$4)$

Exhibit 5

Demand for Pizza Generated from Marginal Utility



$P=\$8$, consumer equilibrium at $Q=3$
MU per \$ is the same for all goods consumed

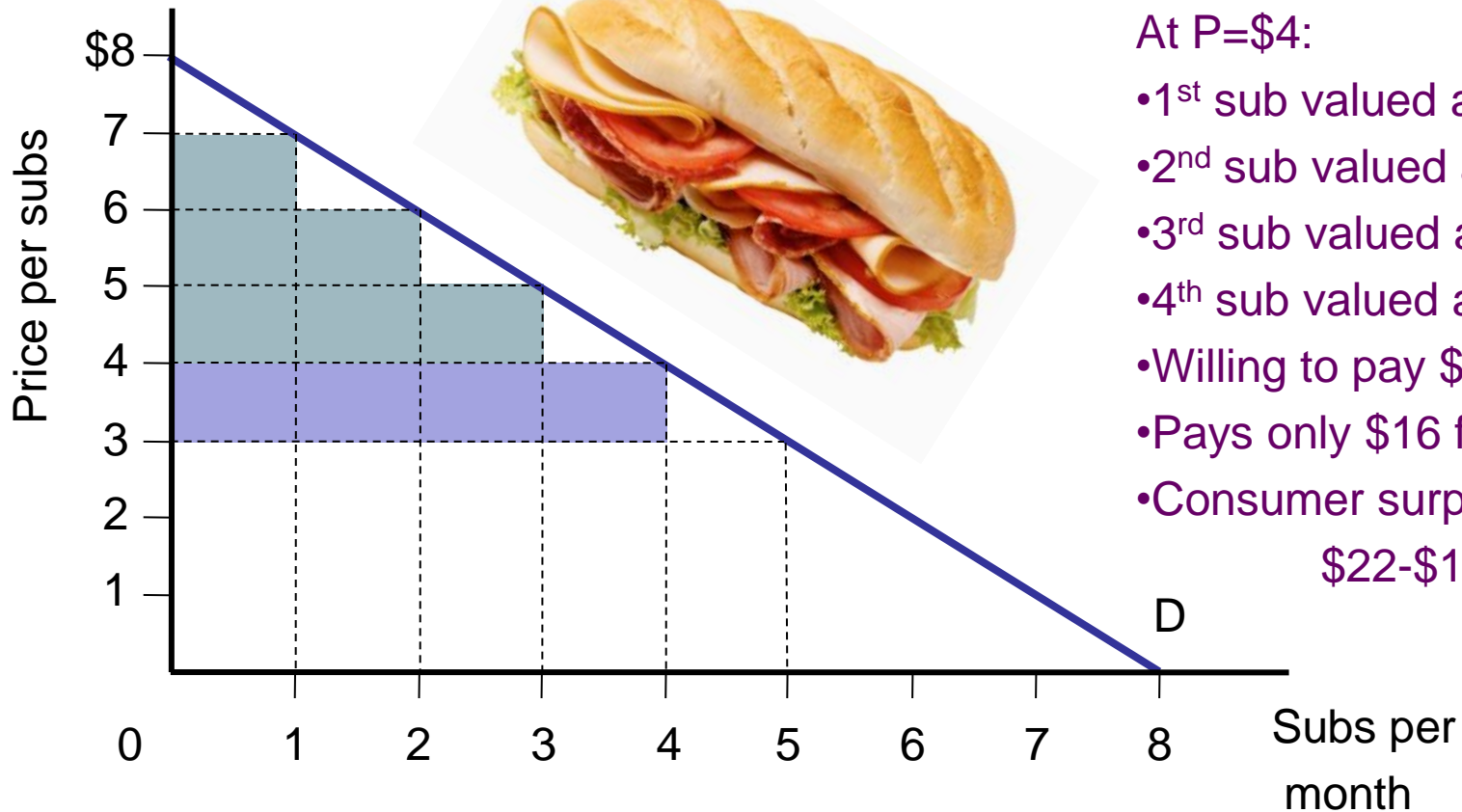
$P=\$6$, consumer equilibrium at $Q=4$

Consumer Surplus

- Value of a good purchased must at least equal the P
- D curve
 - Marginal valuation
- Consumer surplus
 - Consumer bonus
 - Value of total utility minus total spending
 - Area under D, above P



Consumer Surplus from Sub Sandwiches



At $P = \$4$:

- 1st sub valued at \$7
- 2nd sub valued at \$6
- 3rd sub valued at \$5
- 4th sub valued at \$4
- Willing to pay \$22 for 4 subs
- Pays only \$16 for 4 subs
- Consumer surplus
 $\$22 - \$16 = \$6$

When P drops to \$3, consumer surplus increases by \$4

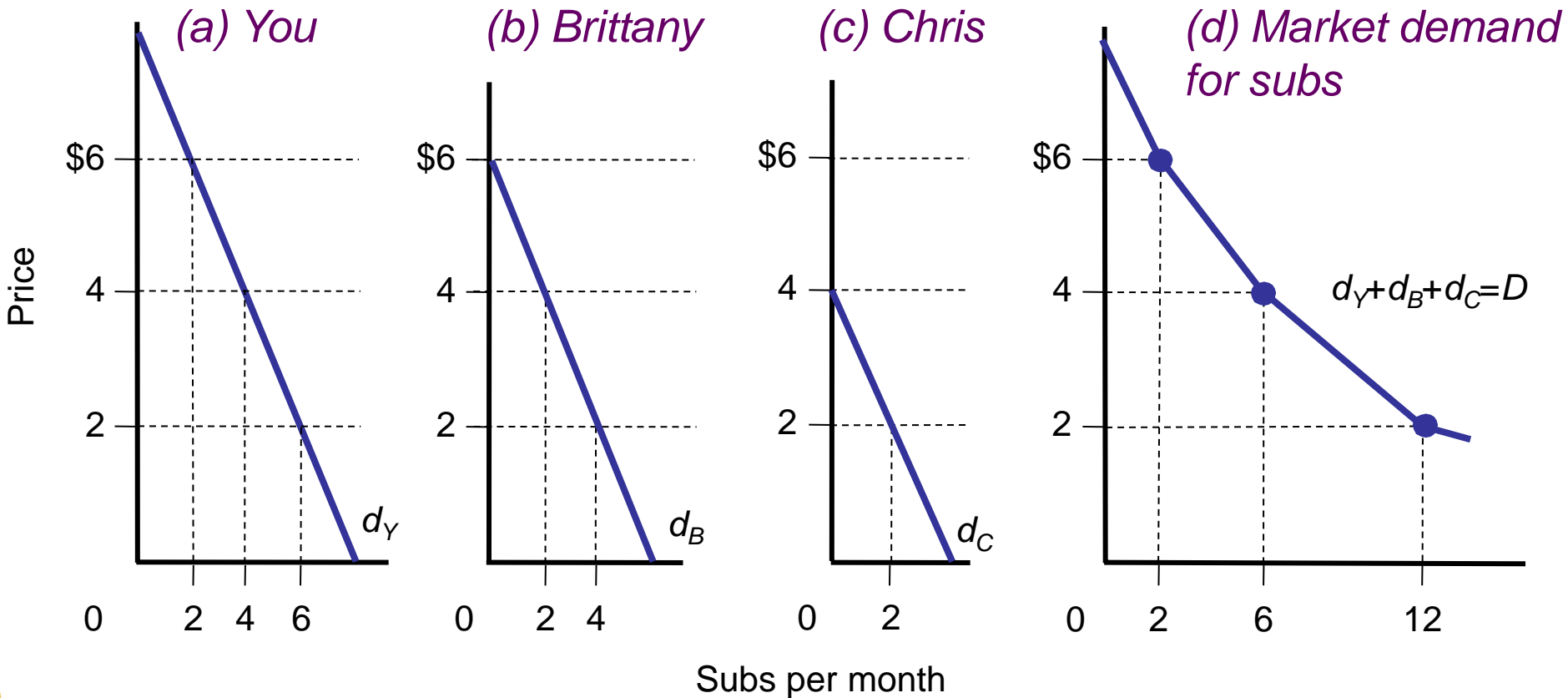
Market D and Consumer Surplus

- **Market D curve**
 - Horizontal sum of individual D curves
 - Total quantity demanded, per period, by all consumers, at various prices
- **Consumer surplus for the market**
 - Amount consumers are willing to pay minus amount they pay
 - Net benefit for consumers
 - Economic welfare



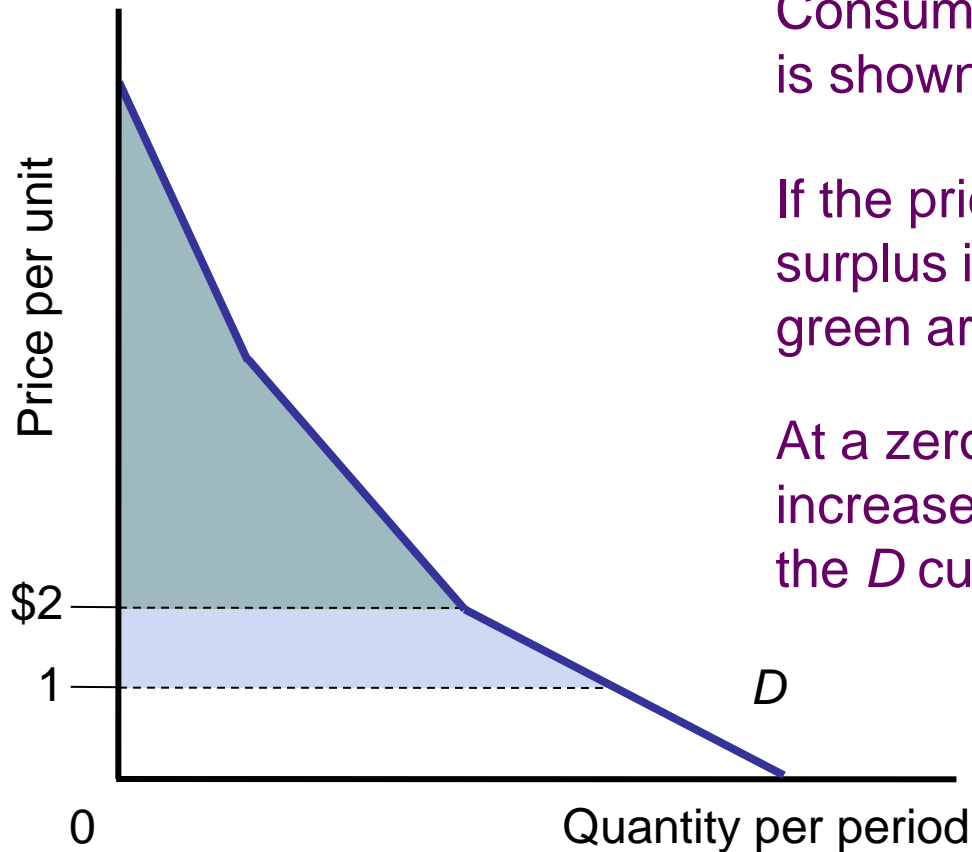
Exhibit 7

Summing Individual Demand Curves to Derive Market Demand for Sub Sandwiches



Market demand curve is the horizontal sum of individual demand curves

Market Demand and Consumers Surplus



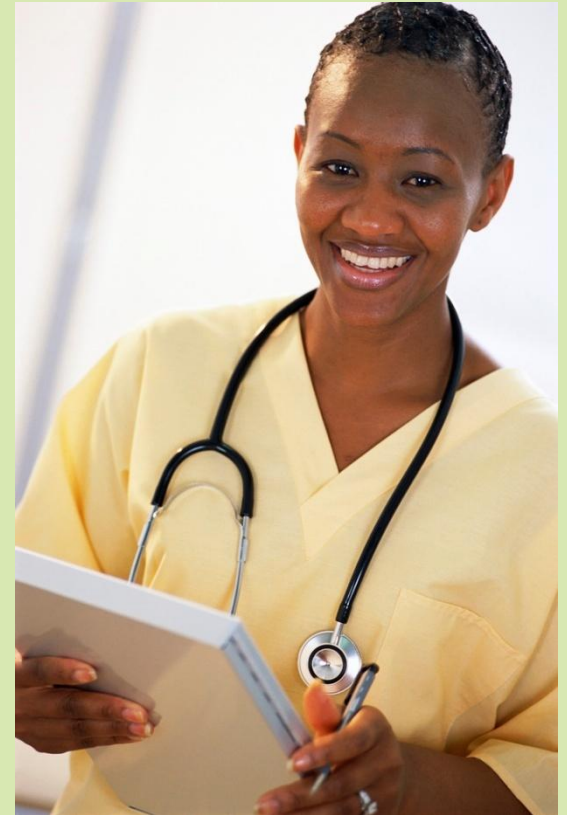
Consumer surplus at a price of \$2 is shown by the blue area.

If the price falls to \$1, consumer surplus increases to include the green area.

At a zero price, consumer surplus increases to the entire area under the D curve.

The Marginal Value of Free Medical Care

- ◆ Free medical care
 - ◆ Consumed until marginal utility = 0
 - ◆ High marginal cost to taxpayers
 - ◆ Waste, fraud, abuse
 - ◆ Less incentive for healthy behavior
- ◆ Charge \$1 per doctor visit
 - ◆ Reduce cost to taxpayers



Role of Time in Demand

- **Consumption**
 - Money price
 - Time price
- **Willing to pay premium for time-saving goods**



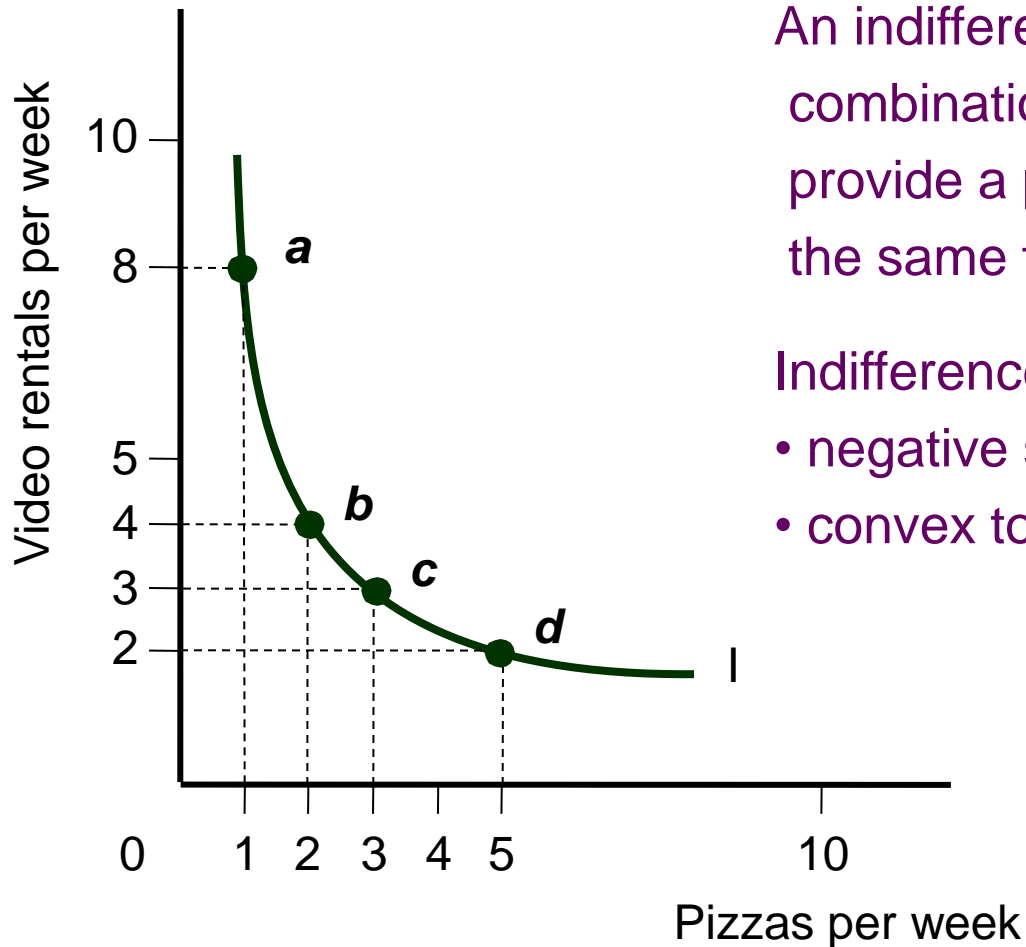
LO⁴

Indifference Curves and Utility Maximization

- Indifference curve
 - Combinations of goods
 - Same total utility
 - Slope downward to right
 - Convex to origin



An Indifference Curve



An indifference curve (I) shows all combinations of two goods that provide a particular consumer with the same total utility.

Indifference curve:

- negative slope
- convex to origin

Indifference Curves and Utility Maximization

- **Marginal rate of substitution MRS**
 - Willingness to trade
 - Slope of indifference curve
- **Law of diminishing MRS**
 - Diminishing slope of I curve



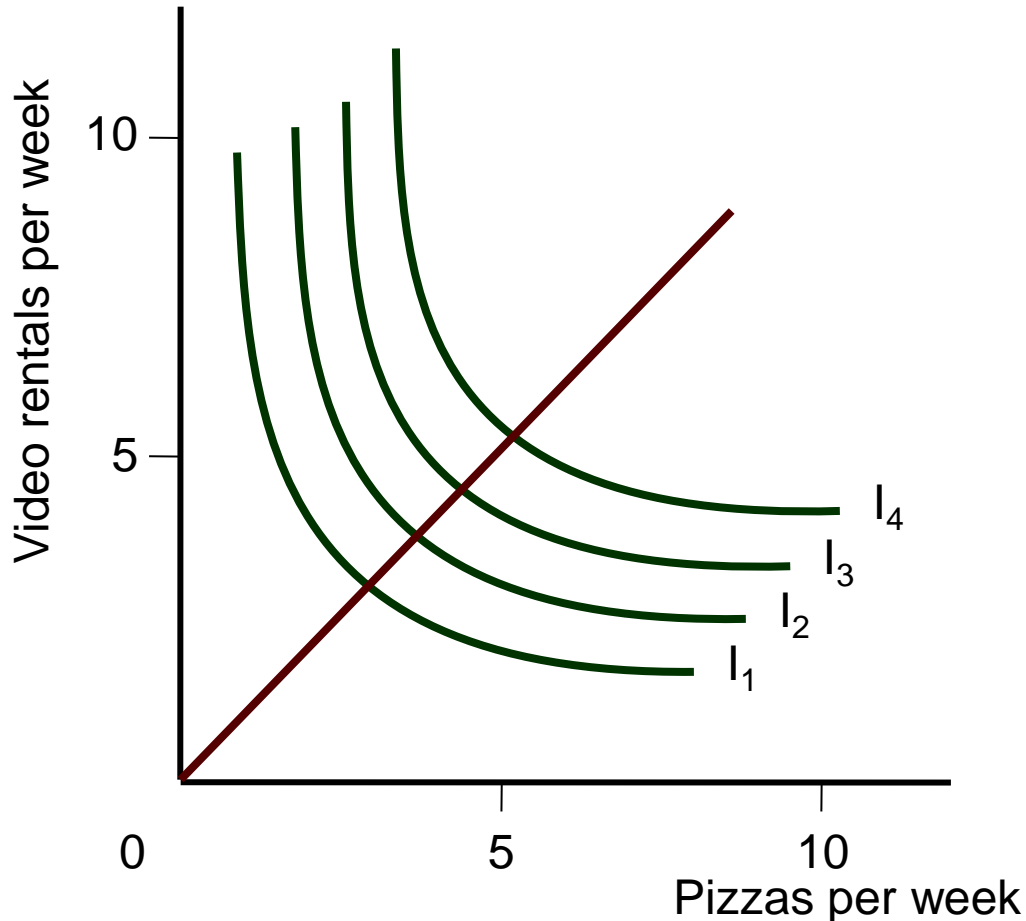
Indifference Curves and Utility Maximization

- Indifference map
 - Graphical representation of consumer's tastes
 - Each I: different utility levels
 - The further indifference curve from origin
 - The higher the utility
 - More of both goods



Exhibit B

An Indifference Map



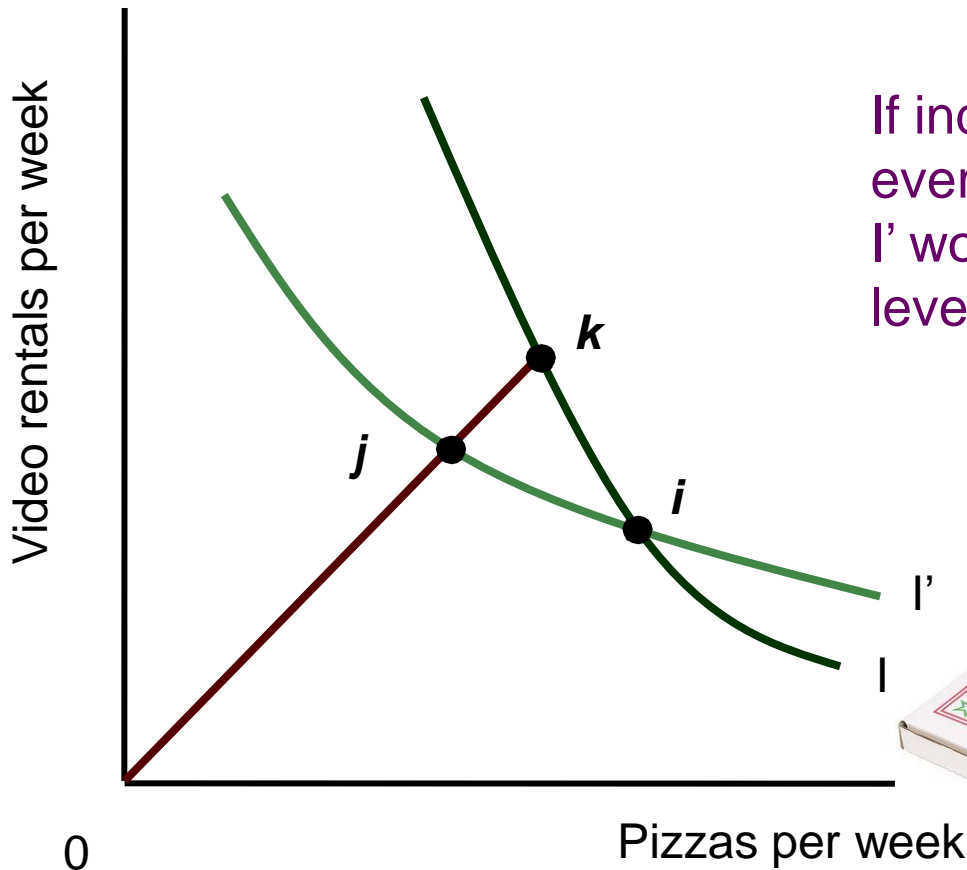
Indifference curves I_1 through I_4 are examples from a consumer's particular indifference map.

Indifference curves farther from origin depict higher levels of utility.

A line intersects each higher indifference curve, reflecting more of both goods.

Exhibit C

Indifference Curves Do Not Intersect



If indifference curves crossed (i) every point on I and every point on I' would have to reflect the same level of utility as i .

k : more pizzas and videos than j ; higher utility than j



Indifference curves cannot intersect

Indifference Curves and Utility Maximization

- The budget line
 - Combinations of goods
 - Able to buy
 - Consumption possibilities frontier
- Slope of budget line:

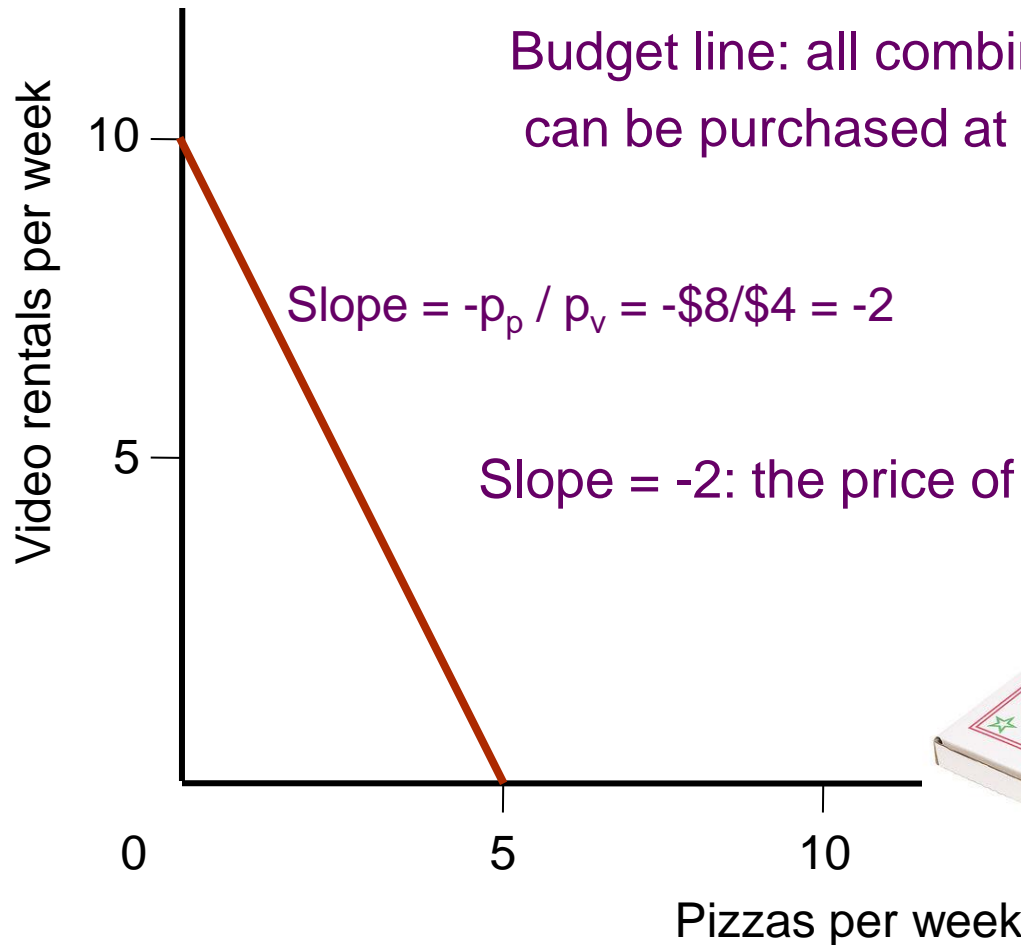
$$= - \frac{I / p_v}{I / p_p} = - \frac{p_p}{p_v}$$



Exhibit D

A Budget Line

Budget line: all combinations of pizza and videos that can be purchased at fixed prices with a given income.



Indifference Curves and Utility Maximization

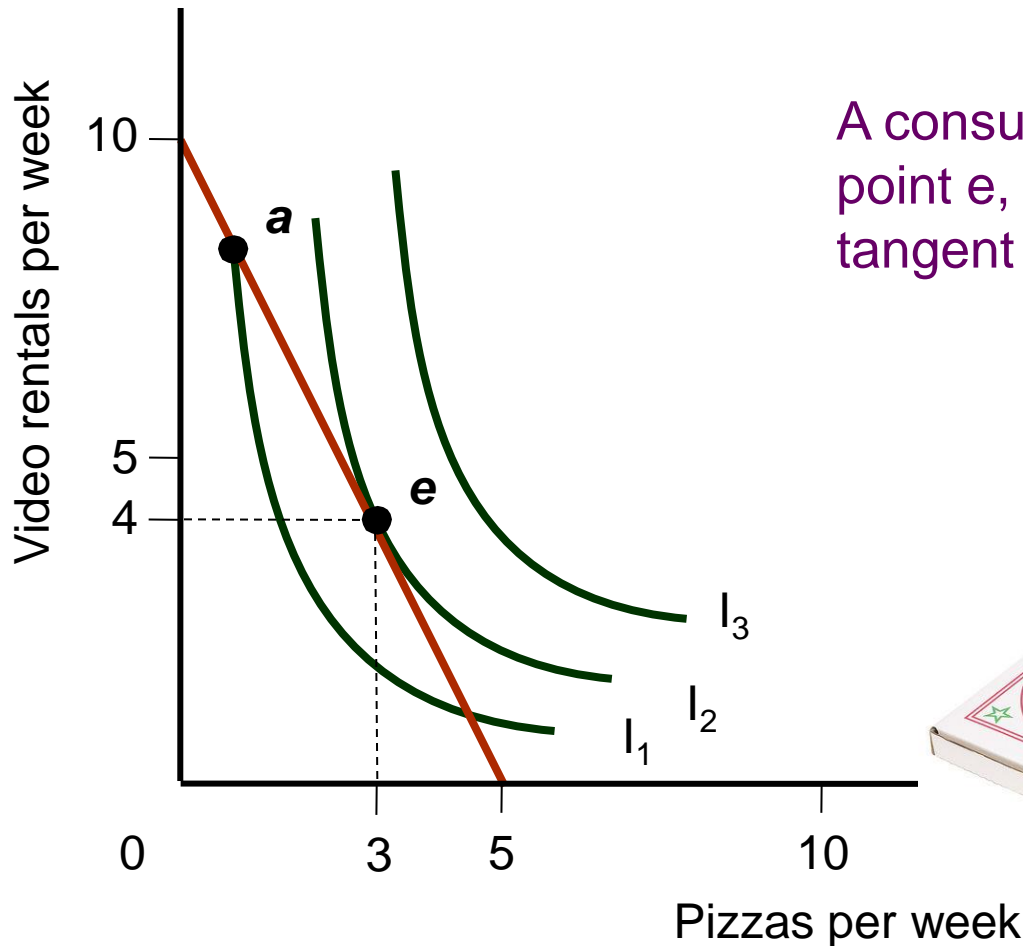
- Consumer equilibrium at the tangency
 - Maximize utility
 - Indifference curve tangent to budget line

$$\left. \begin{array}{l} MRS = \frac{p_p}{p_v} \\ MRS = \frac{MU_p}{MU_v} \end{array} \right\} \frac{MU_p}{p_p} = \frac{MU_v}{p_v}$$



Exhibit E

Utility Maximization



A consumer's utility is maximized at point e , where indifference curve I_2 is tangent to the budget line.



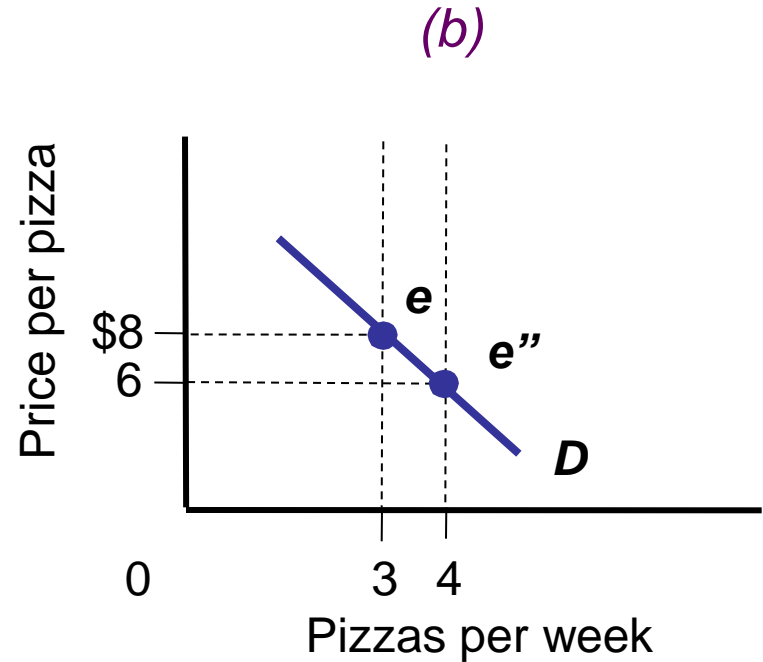
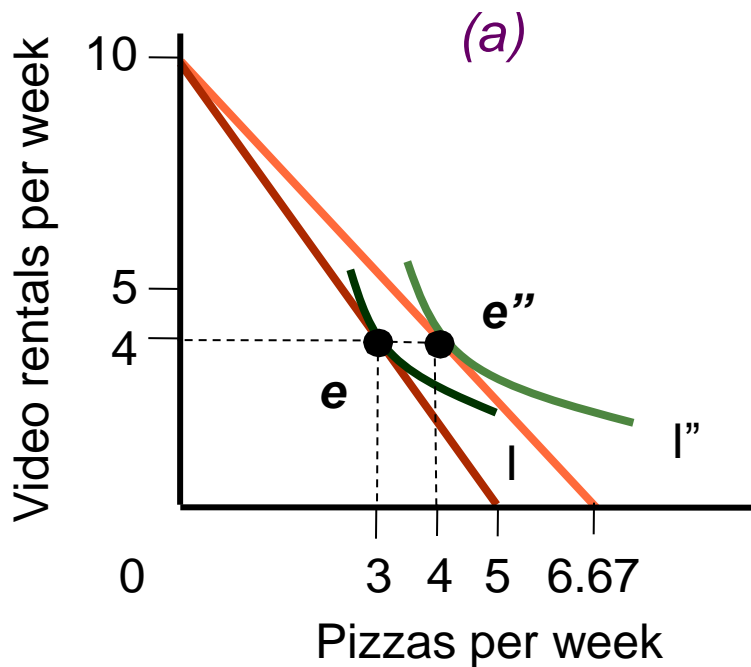
Indifference Curves and Utility Maximization

- **Effects of a change in price**
 - **Derive the D curve**
- **Income effect**
- **Substitution effect**



Exhibit F

Effect of a Drop in the Price of Pizza

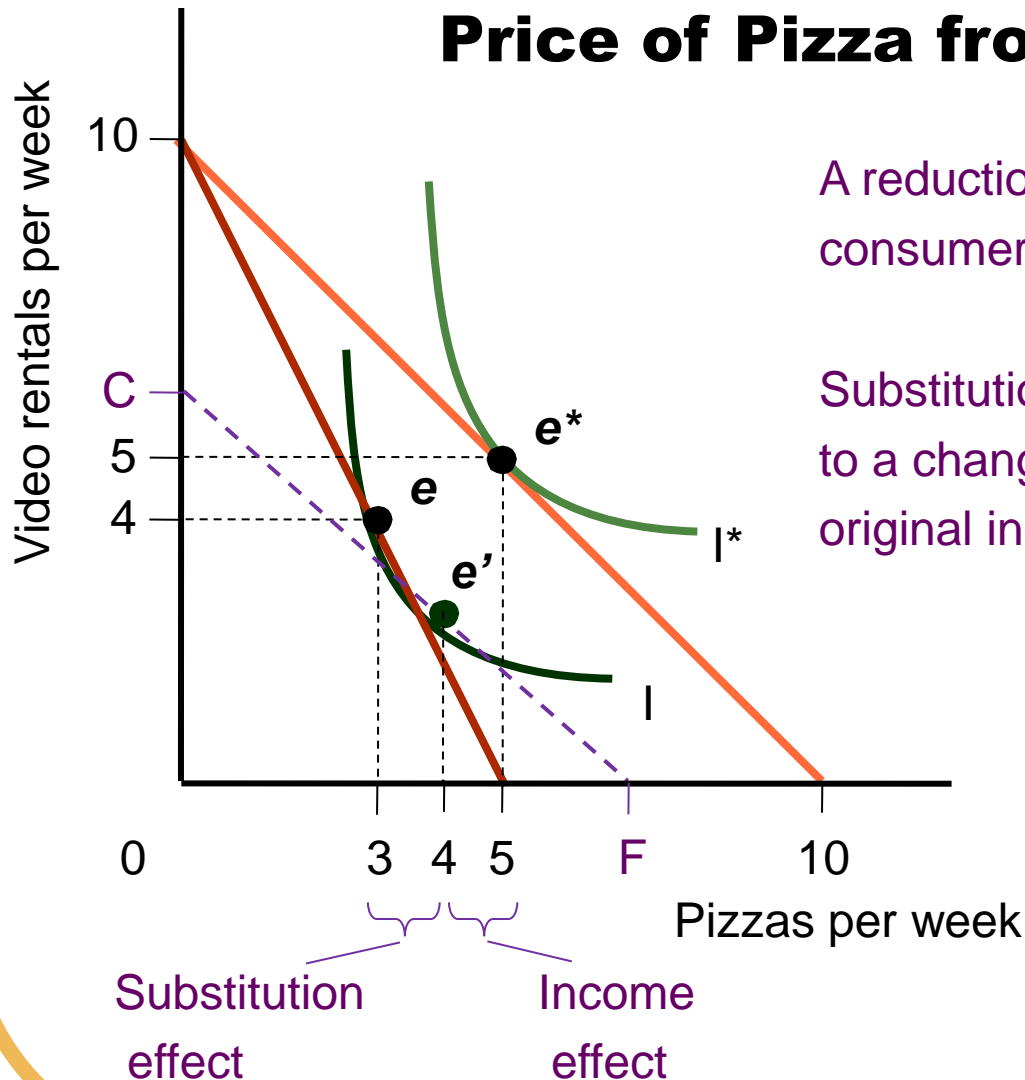


A reduction in the price of pizza rotates the budget line rightward. The consumer is back in equilibrium at point e'' along the new budget line.

A drop in price of pizza increases quantity demanded.

Exhibit G

Substitution and Income Effects of a Drop in the Price of Pizza from \$8 to \$4



A reduction in the price of pizza moves the consumer from e to e^* .

Substitution effect: e to e' ; consumer's reaction to a change in relative prices along the original indifference curve.

Income effect: e' to e^* ; moves the consumer to a higher indifference curve at the new relative price ratio.