

Econ 101: Principles of Microeconomics

Ch. 10: The Rational Consumer

Fall 2010

Outline

- 1 Utility: Getting Satisfaction
- 2 Budgets and Optimal Consumption
- 3 The Optimal Consumption Choice
- 4 Spending the Marginal Dollar
- 5 From Utility to the Demand Curve

The Rational Consumer

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 - Define more precisely what we mean by each of these notions.
 - Use them to determine how the individual can then make choices so as to maximize their well-being (or **utility**).

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 - That preference cannot change over time
 - That individual preferences can (or even should) be compared.
- We are also not commenting on *what* people like, but simply assuming that they have a consistent set of preferences.

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- While the units used to measure utility are not important, we'll use the hypothetical units: **utils**.

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- The **Marginal Utility Curve** graphical marginal utility as a function of the quantity consumed.

Anne's Utility from Pizza

Number of Pizzas	Total Utility	Marginal Utility
0	0	

Anne's Utility from Pizza

Number of Pizzas	Total Utility	Marginal Utility
0	0	50

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Number of Pizzas	Total Utility	Marginal Utility
0	0	
1	50	50

Anne's Utility from Pizza

Number of Pizzas	Total Utility	Marginal Utility
0	0	
1	50	50
		38

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Number of Pizzas	Total Utility	Marginal Utility
0	0	
1	50	50
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0	0	
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		33

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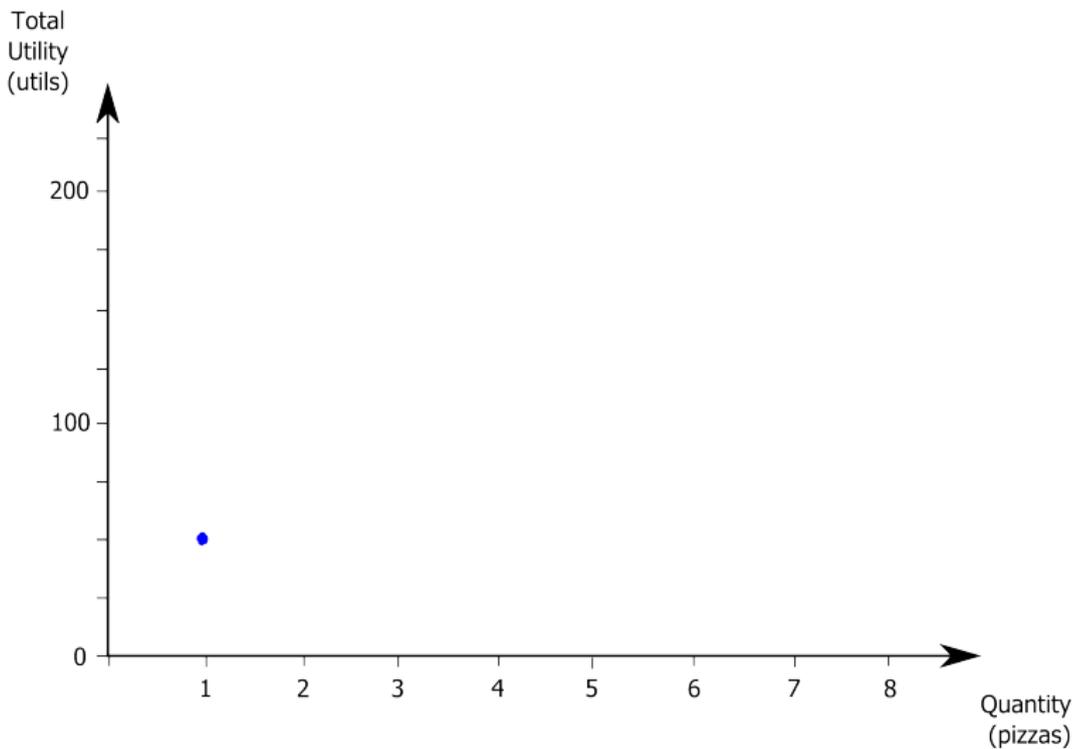
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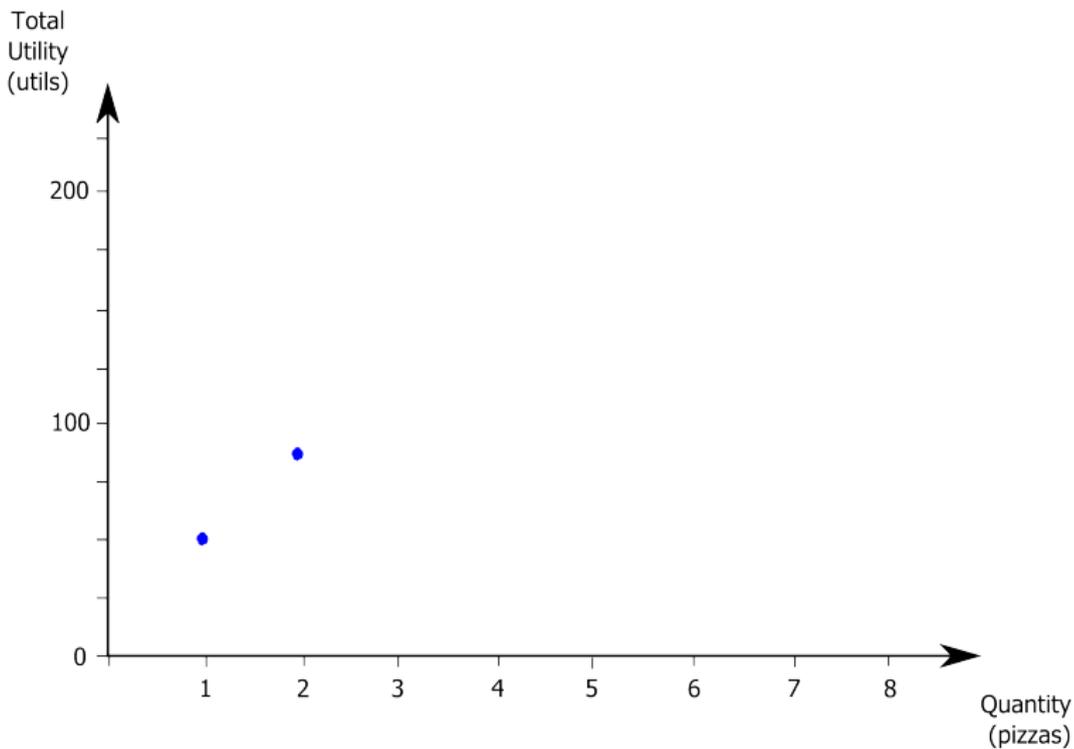
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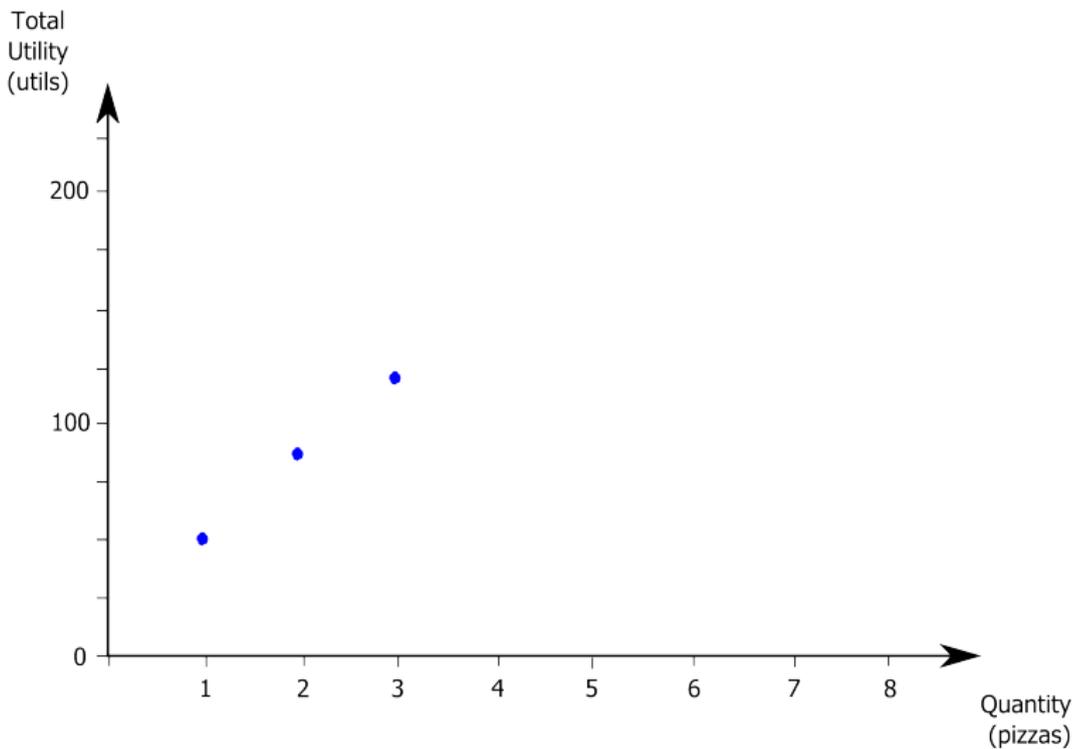
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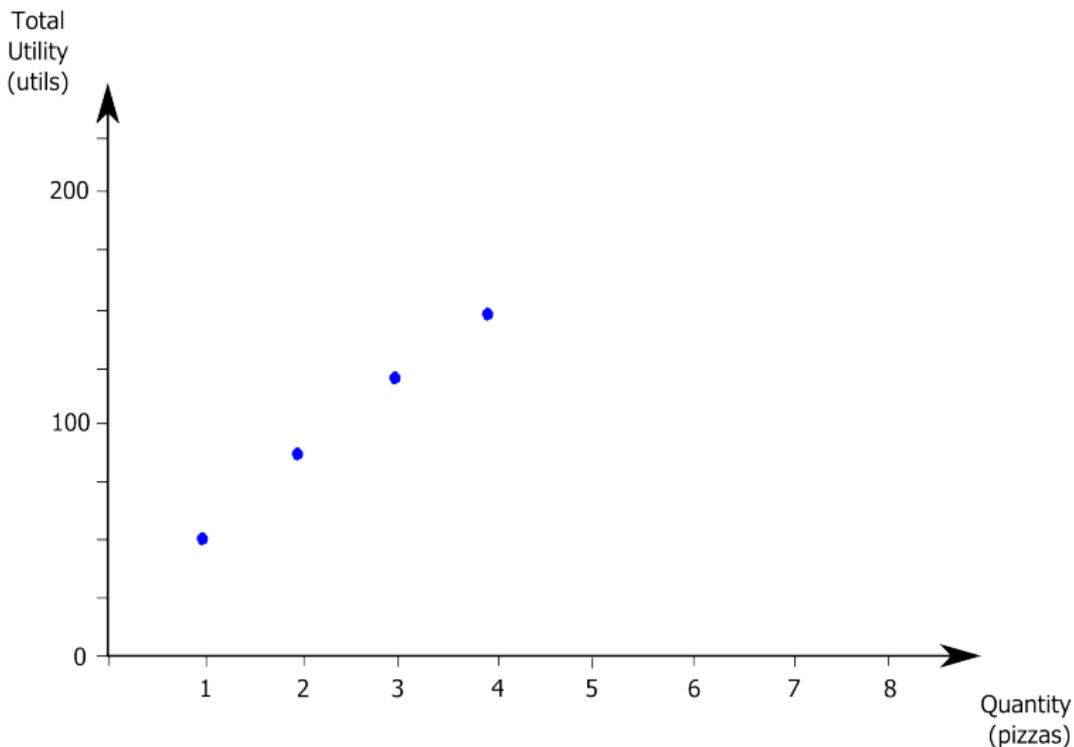
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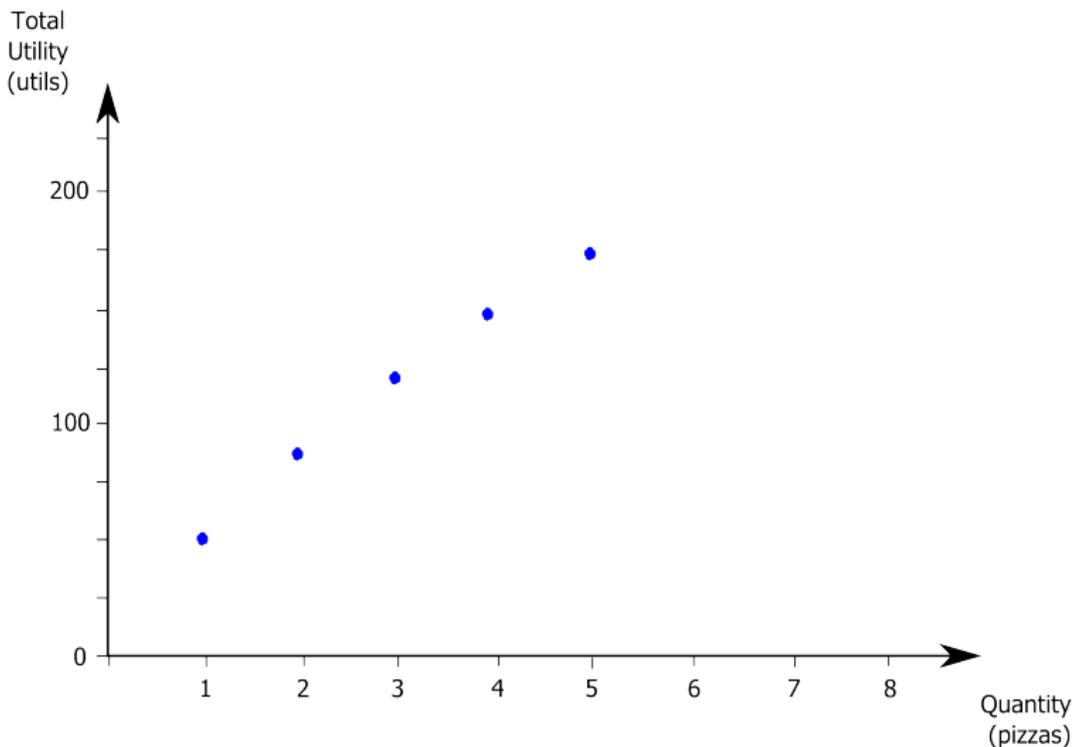
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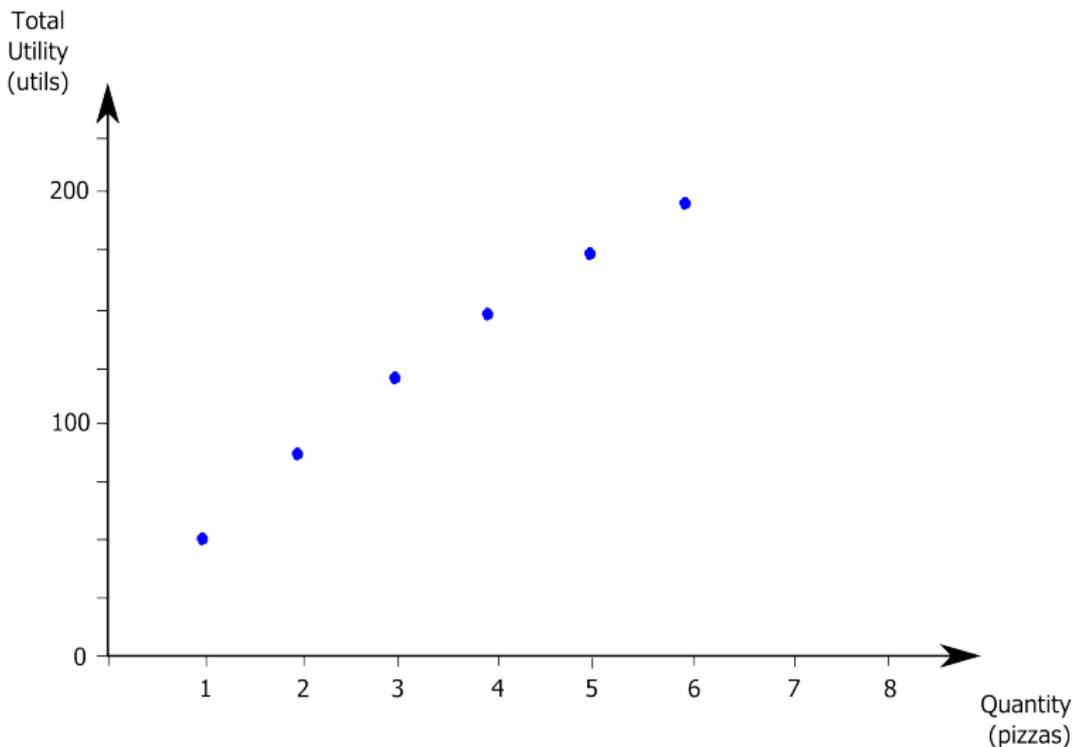
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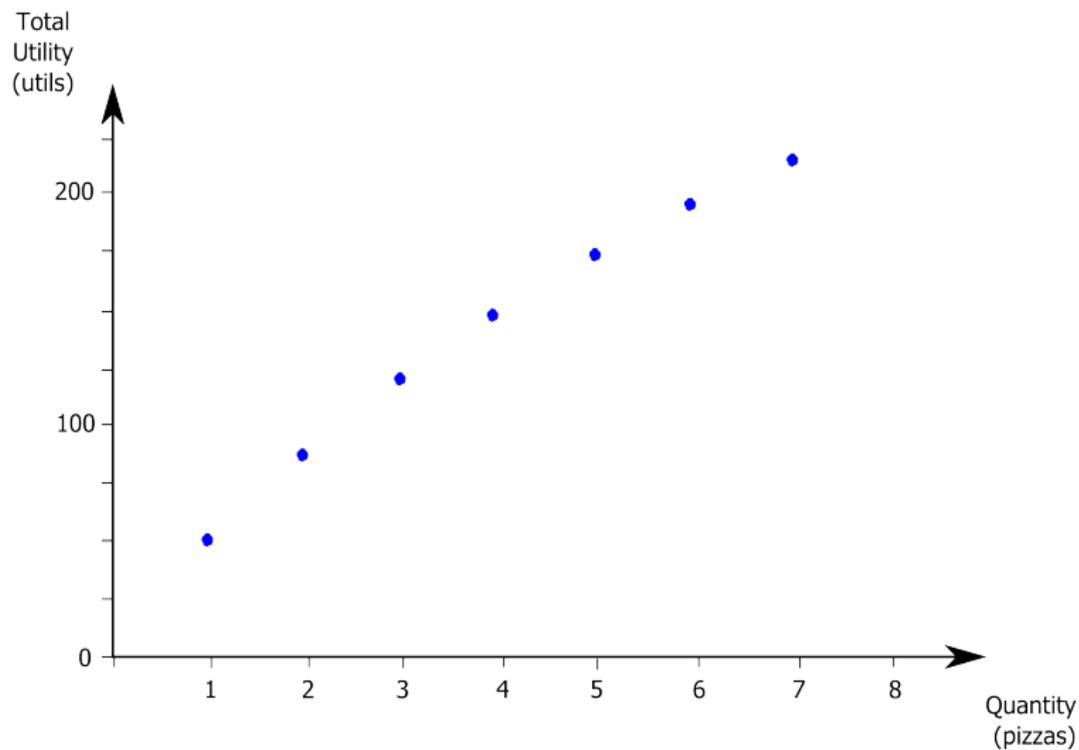
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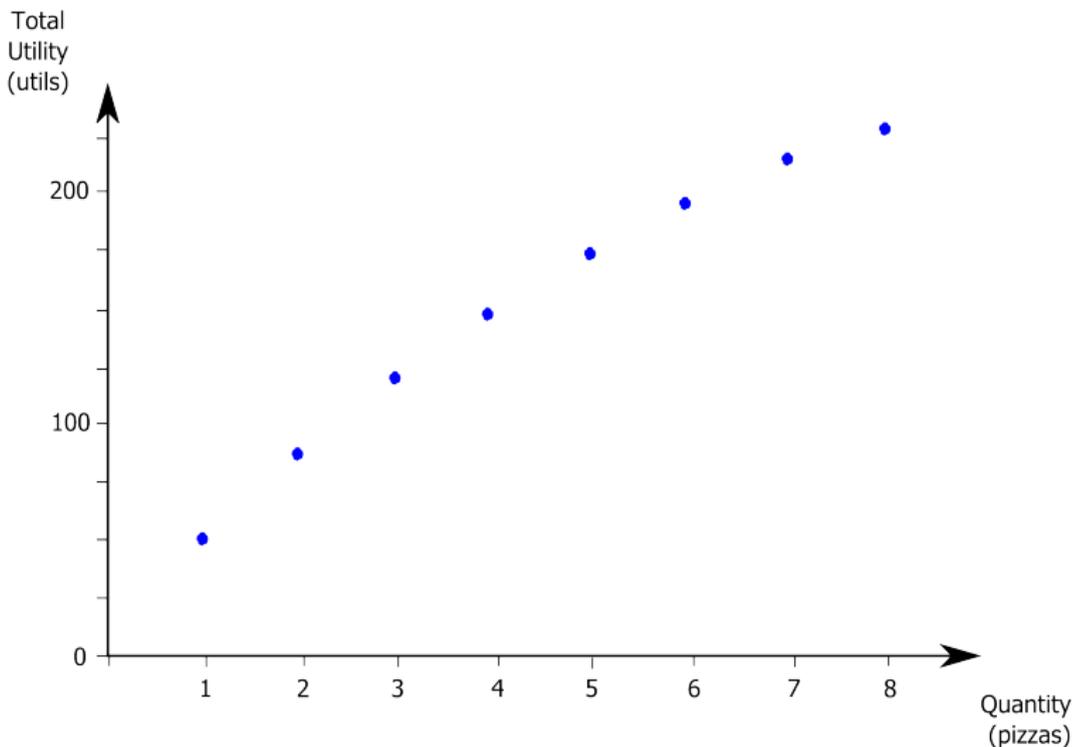
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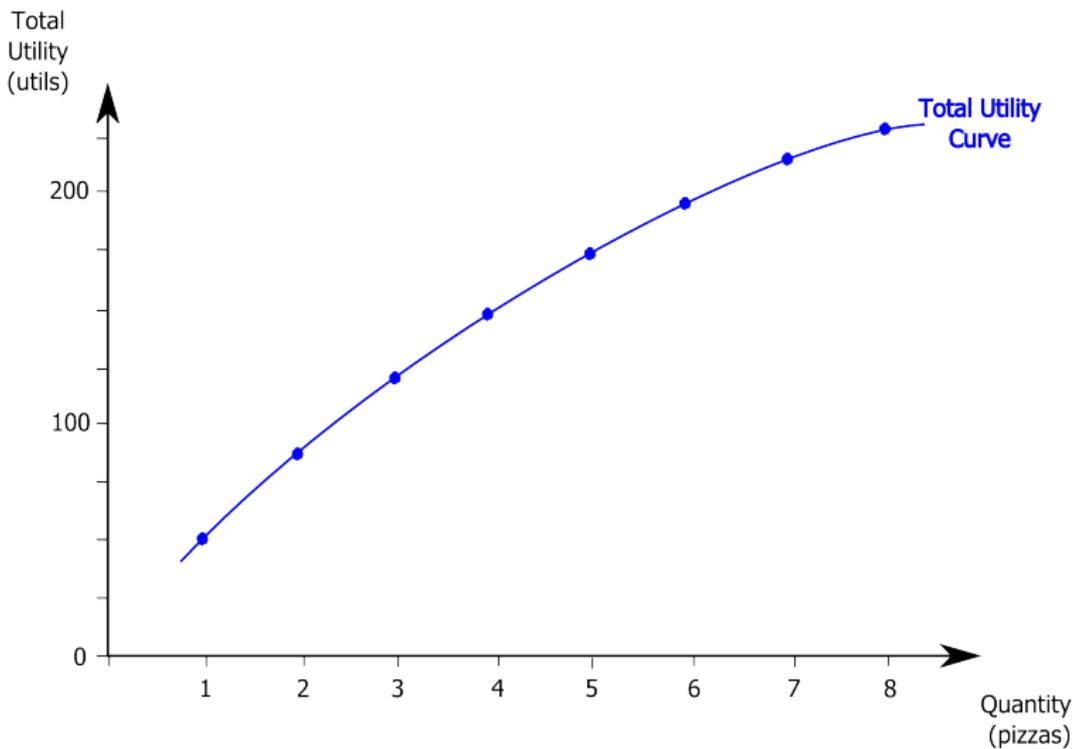
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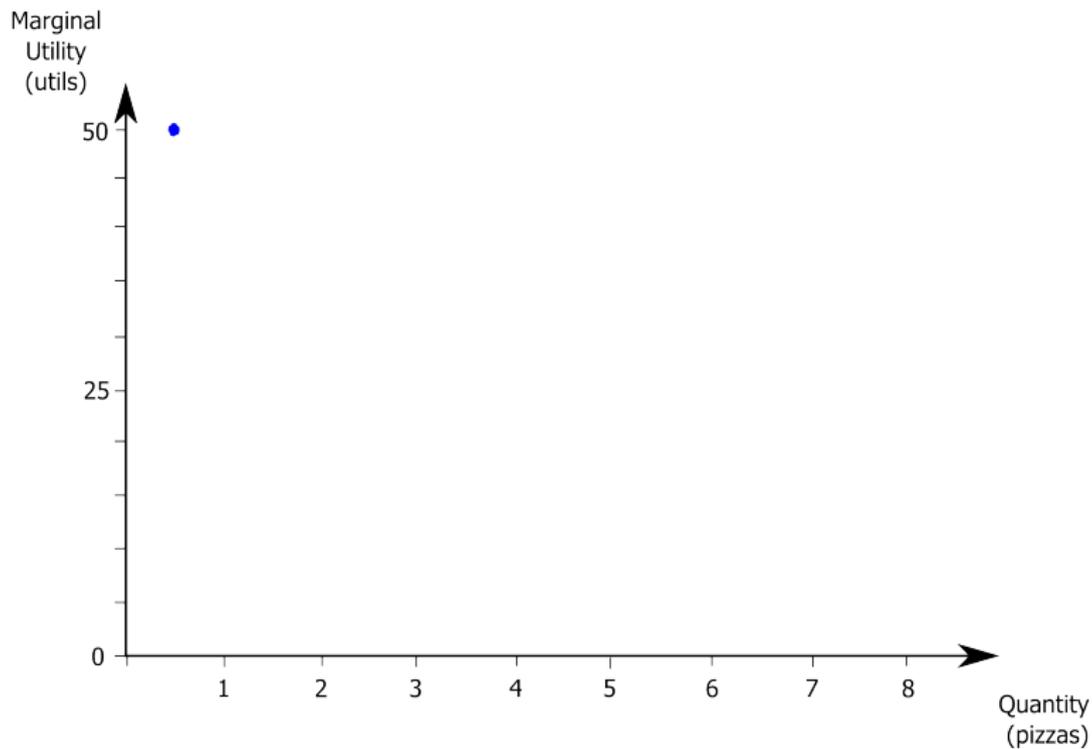
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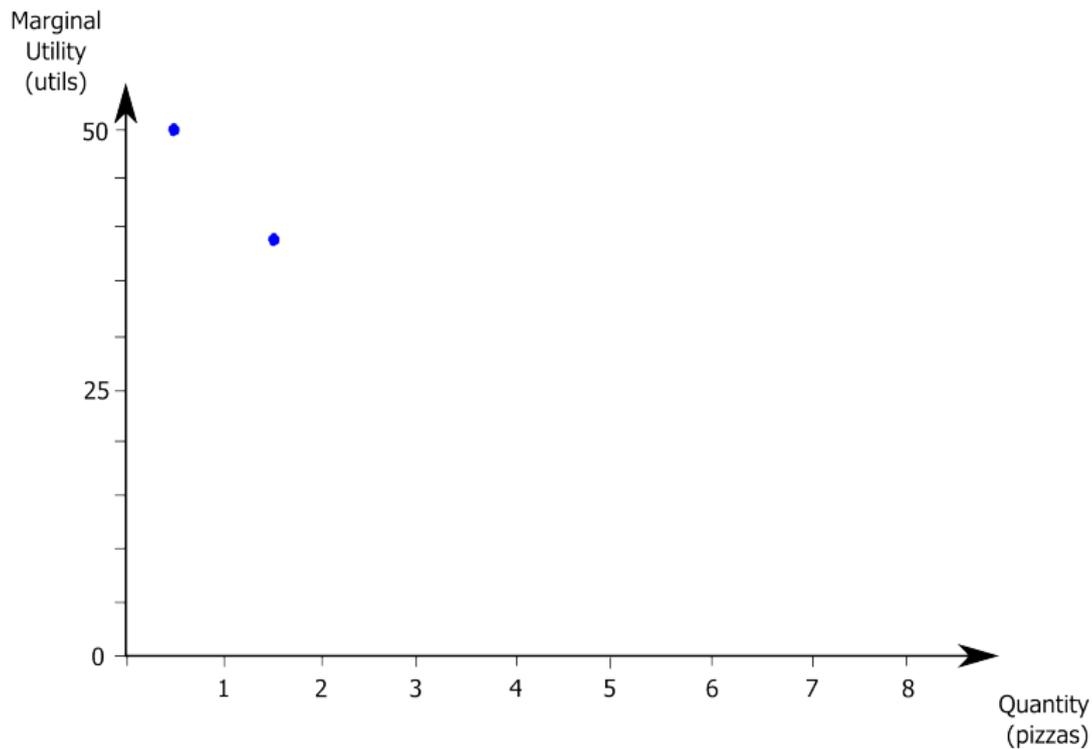
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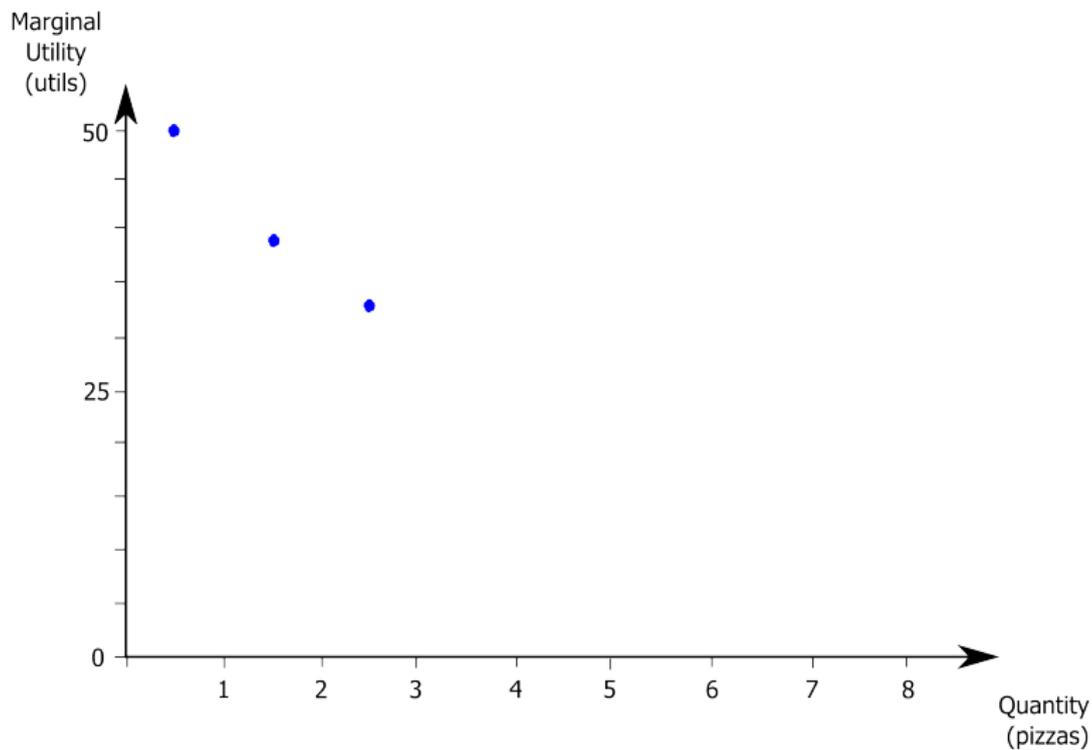
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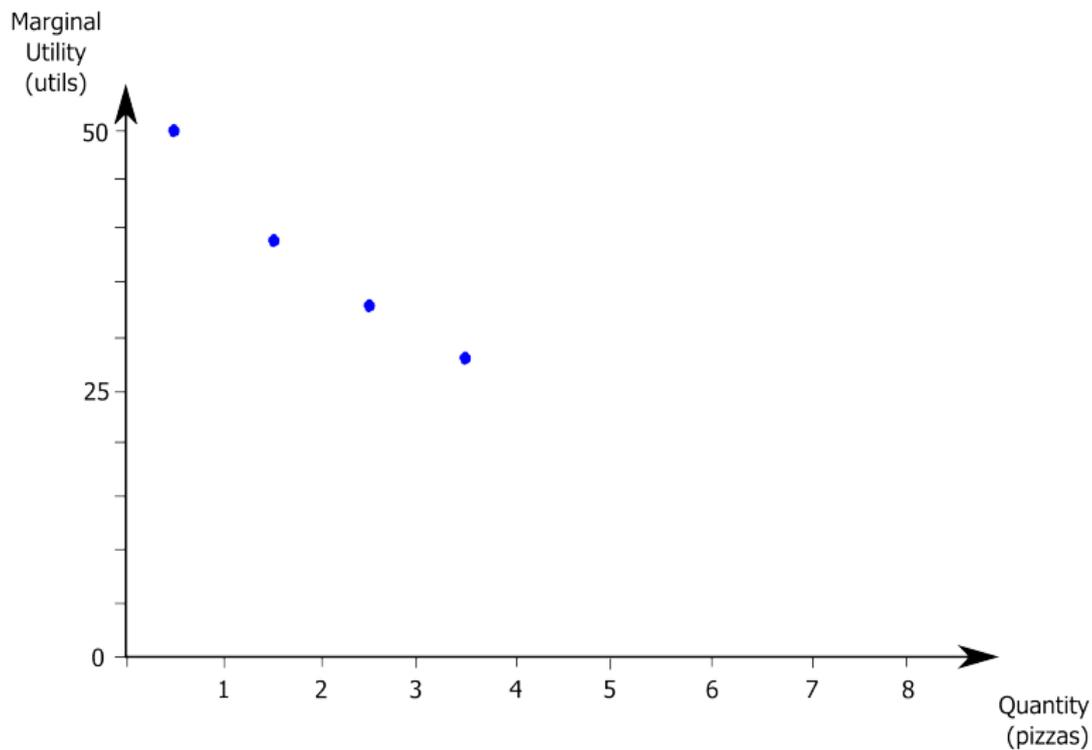
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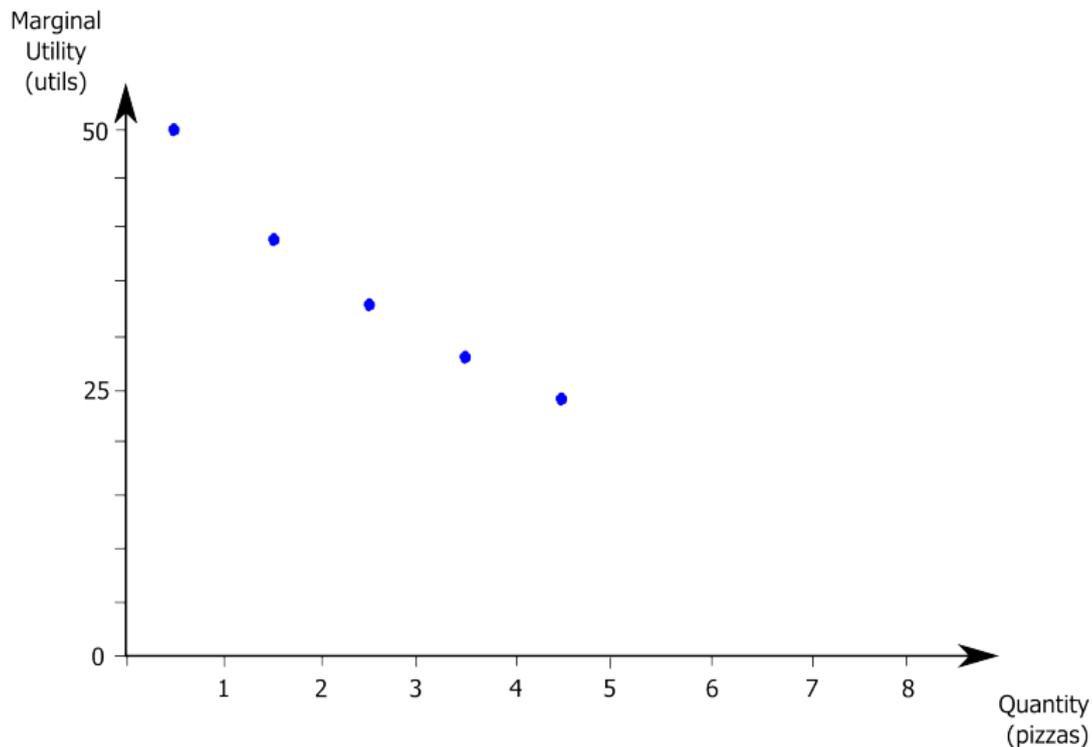
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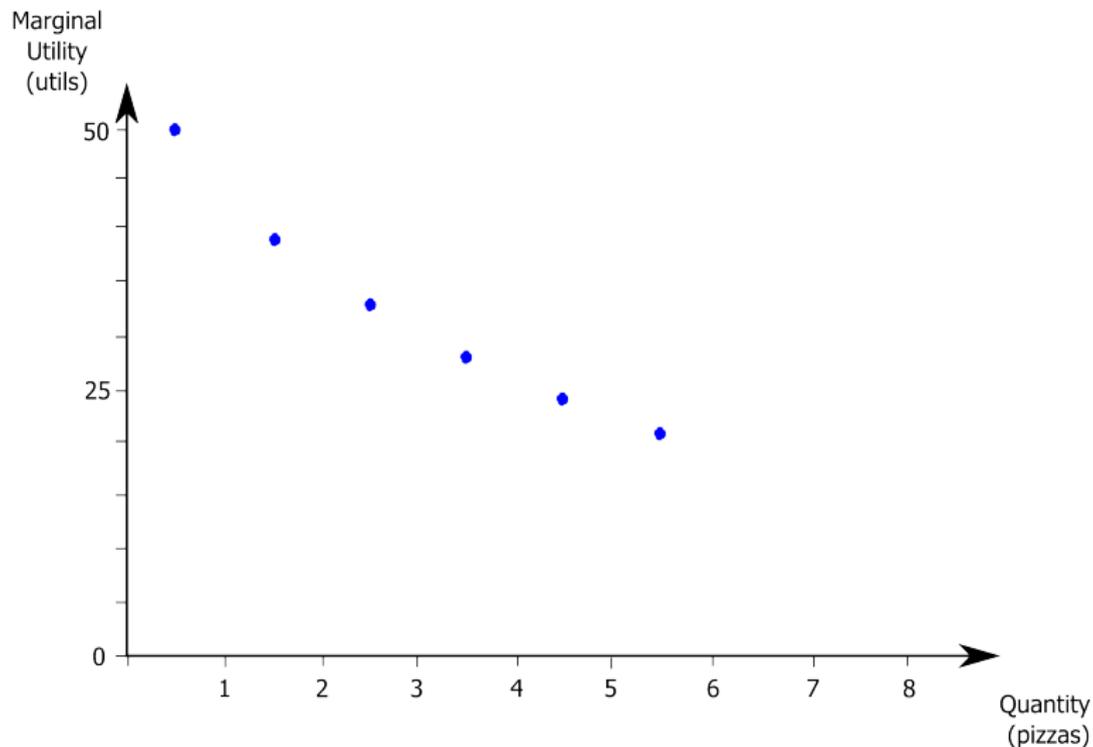
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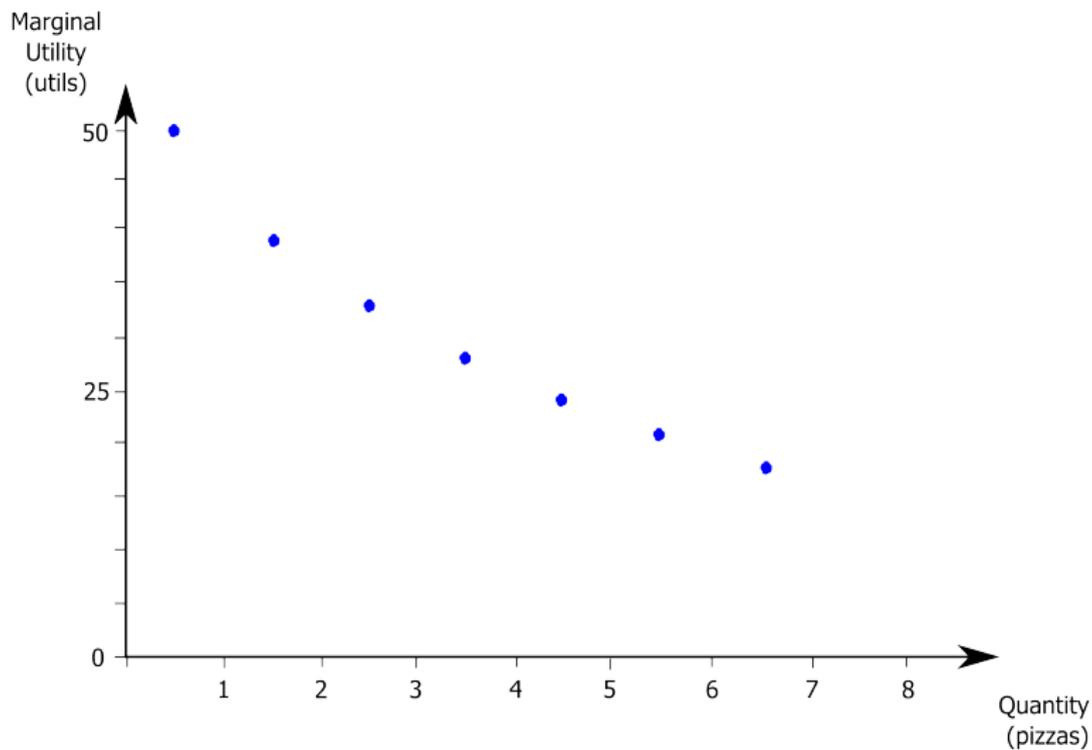
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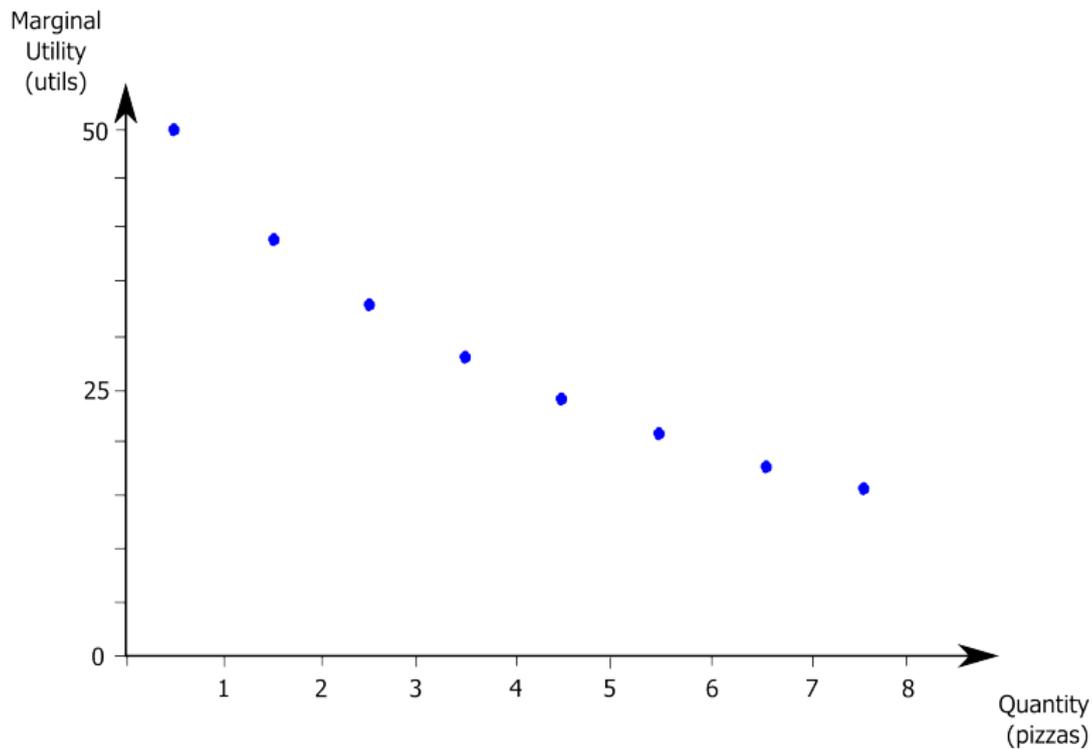
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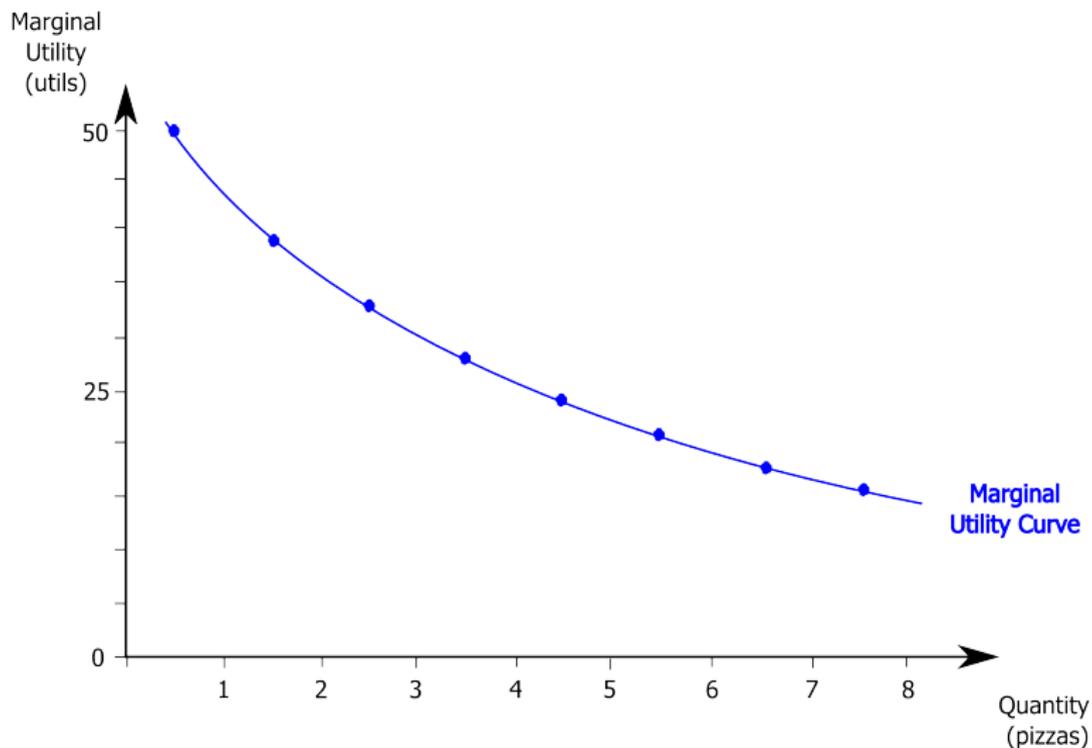
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 - Consumption is only useful after a given quantity is reached (e.g., wallpaper).

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- While the previous section defined the utility function as describing what we *want to consume*, the current section focuses on the budget constraint determines what we *can consume*.

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 - whose available income is given by Y
 - who can only spend money on one of two goods: X_1 and X_2
 - who faces prices for these two goods denoted by P_1 and P_2 , respectively.

The Budget Constraint

- A **budget constraint** requires that the cost of a consumer's consumption bundle be no more than the consumer's income.
- Anne doesn't buy as much pizza as she can
 - not only because she stops enjoying more pizza (i.e., her marginal utility from pizza eventually becomes zero),
 - but also because she only has a limited amount of money to spend on anything.
- The **consumption possibilities set** is the set of all the possible consumption bundles that the consumer can afford given their income.
- The **budget line** identifies all the possible consumption bundles that are available to the consumer who spends *all* of their income.
- Consider a person
 - whose available income is given by Y
 - who can only spend money on one of two goods: X_1 and X_2
 - who faces prices for these two goods denoted by P_1 and P_2 , respectively.
- The budget line is then given by: $P_1X_1 + P_2X_2 = Y$.

Anne's Budget Constraint

- Suppose that Anne has a monthly budget of \$50 (i.e., $Y = 50$).

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 - A pizza costs \$10 (i.e., $P_1 = 10$)

Anne's Budget Constraint

- Suppose that Anne has a monthly budget of \$50 (i.e., $Y = 50$).
- Suppose she can spend this money on either pizza (X_1) or movies (X_2).
- Finally, suppose that
 - A pizza costs \$10 (i.e., $P_1 = 10$)
 - A movie ticket costs \$5 (i.e., $P_2 = 5$)

Anne's Budget Constraint

- Suppose that Anne has a monthly budget of \$50 (i.e., $Y = 50$).
- Suppose she can spend this money on either pizza (X_1) or movies (X_2).
- Finally, suppose that
 - A pizza costs \$10 (i.e., $P_1 = 10$)
 - A movie ticket costs \$5 (i.e., $P_2 = 5$)
- Then Anne's budget line is given by:

$$10X_1 + 5X_2 = 50 \quad (1)$$

Budget Line in Table Form

- We can consider Anne's budget constraint in tabular form

Pizza		Movies	
Quantity (X_1)	Expenditure	Quantity (X_2)	Expenditure

Budget Line in Table Form

- We can consider Anne's budget constraint in tabular form

Pizza		Movies	
Quantity (X_1)	Expenditure	Quantity (X_2)	Expenditure
0	0	10	50

Budget Line in Table Form

- We can consider Anne's budget constraint in tabular form

Pizza		Movies	
Quantity (X_1)	Expenditure	Quantity (X_2)	Expenditure
0	0	10	50
1	10	8	40

Budget Line in Table Form

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Pizza		Movies	
Quantity (X_1)	Expenditure	Quantity (X_2)	Expenditure
0	0	10	50
1	10	8	40
2	20	6	30

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Pizza		Movies	
Quantity (X_1)	Expenditure	Quantity (X_2)	Expenditure
0	0	10	50
1	10	8	40
2	20	6	30
3	30	4	20

Budget Line in Table Form

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Pizza		Movies	
Quantity (X_1)	Expenditure	Quantity (X_2)	Expenditure
0	0	10	50
1	10	8	40
2	20	6	30
3	30	4	20
4	40	2	10

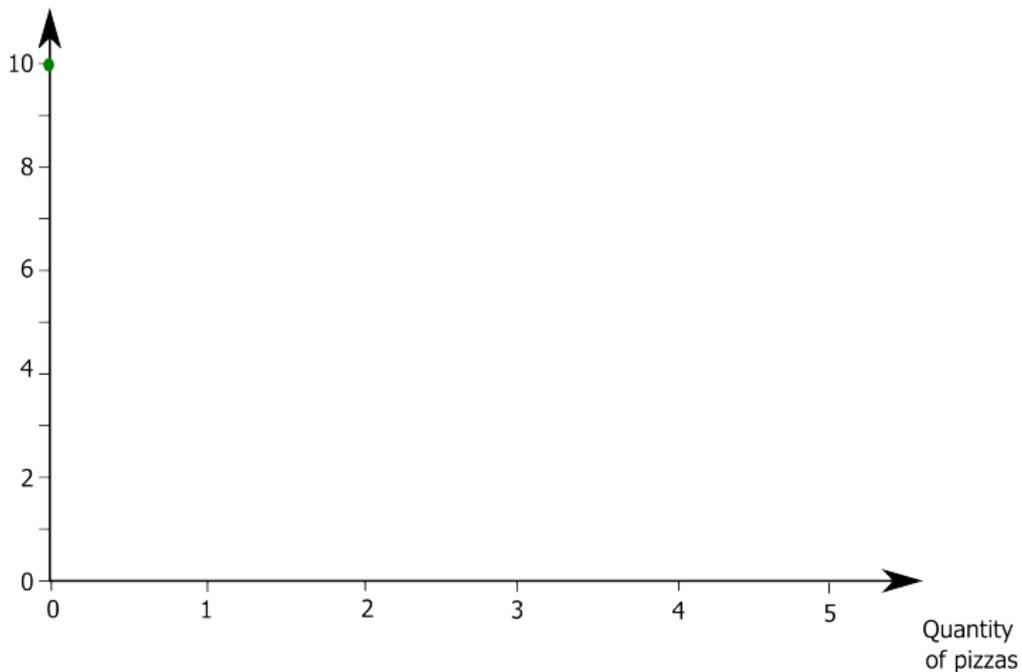
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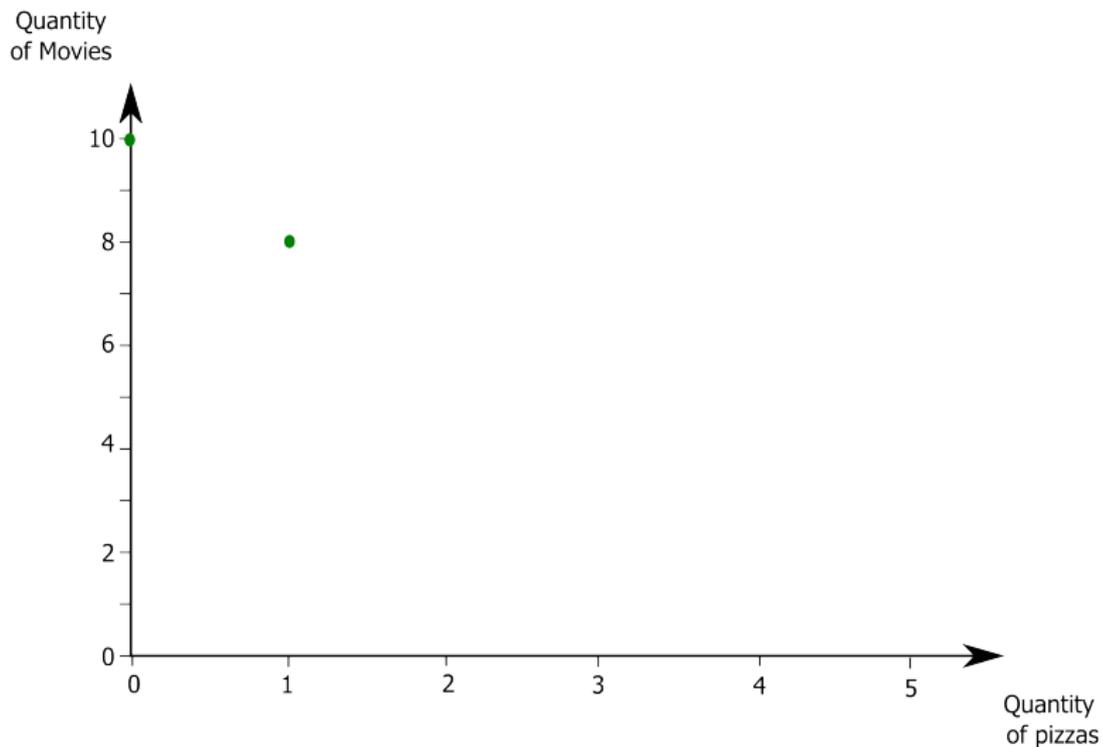
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1	10	8	40
2	20	6	30
3	30	4	20
4	40	2	10
5	50	0	0

The Budget Line

Quantity
of Movies

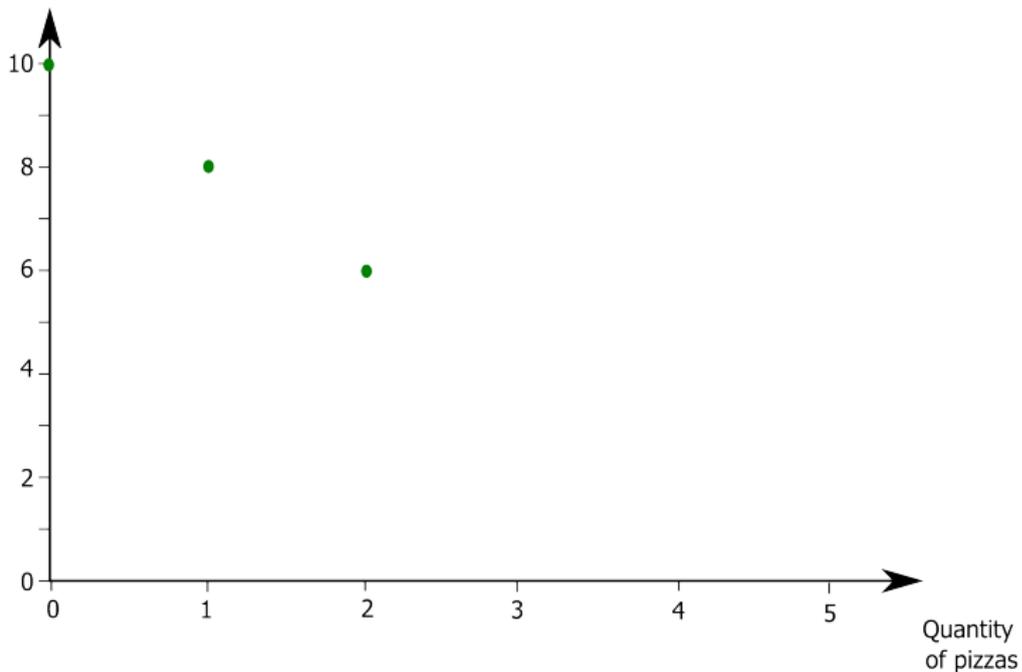


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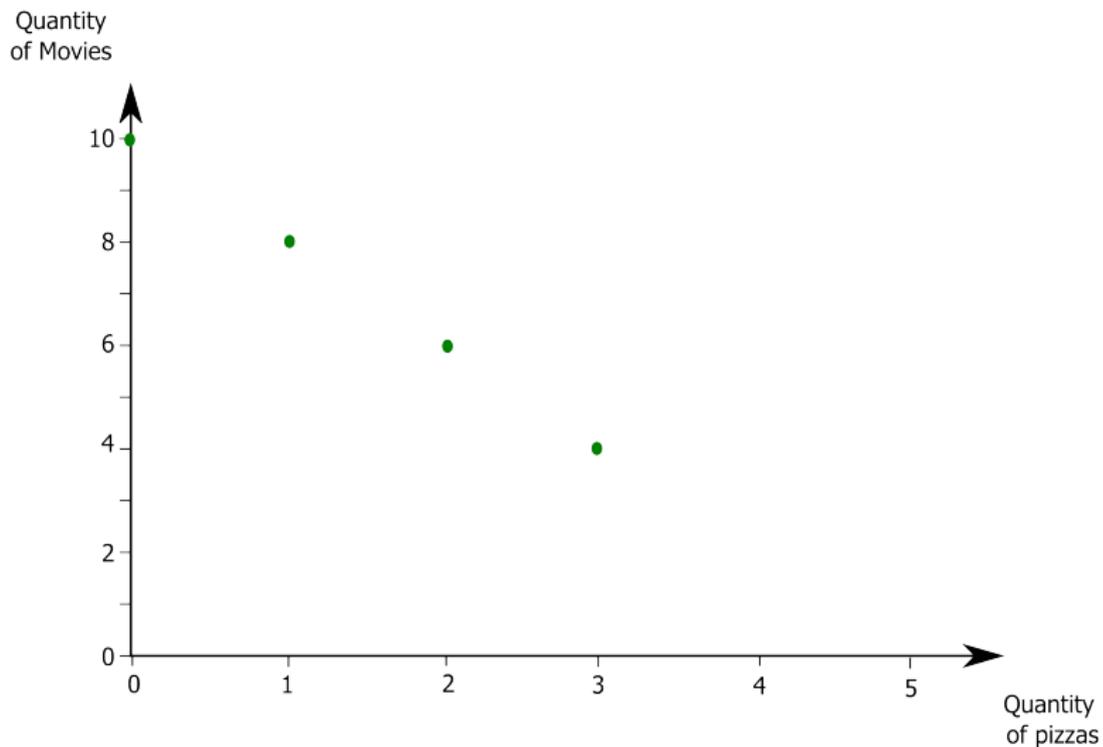


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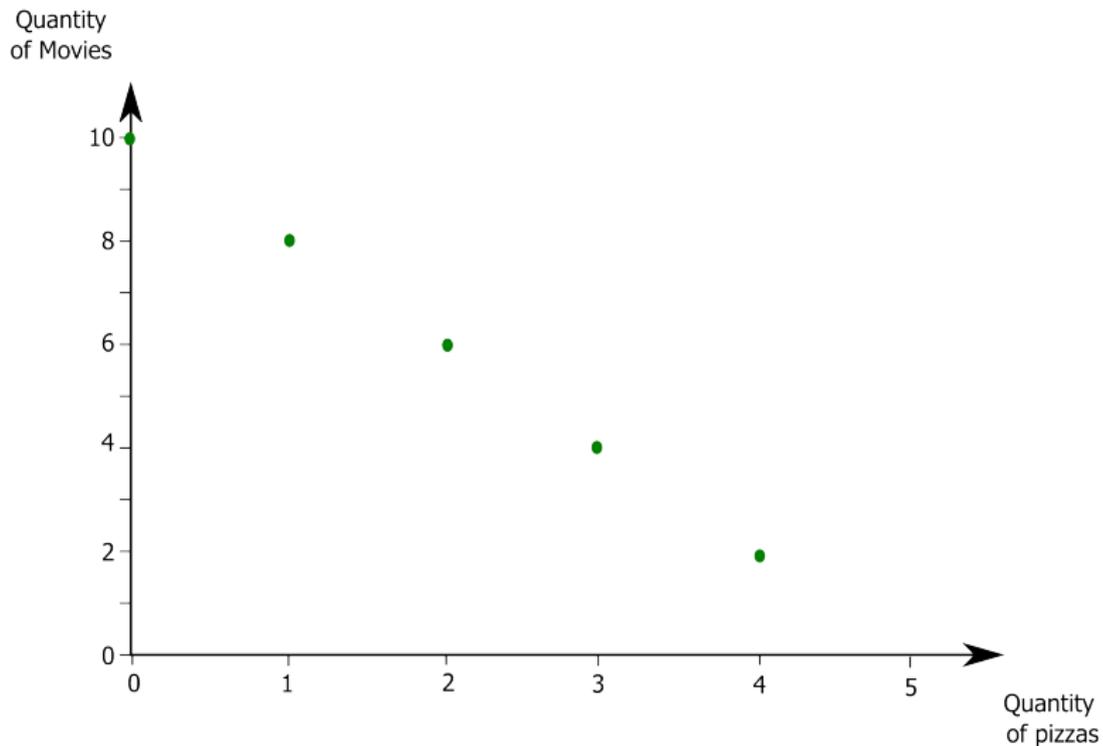
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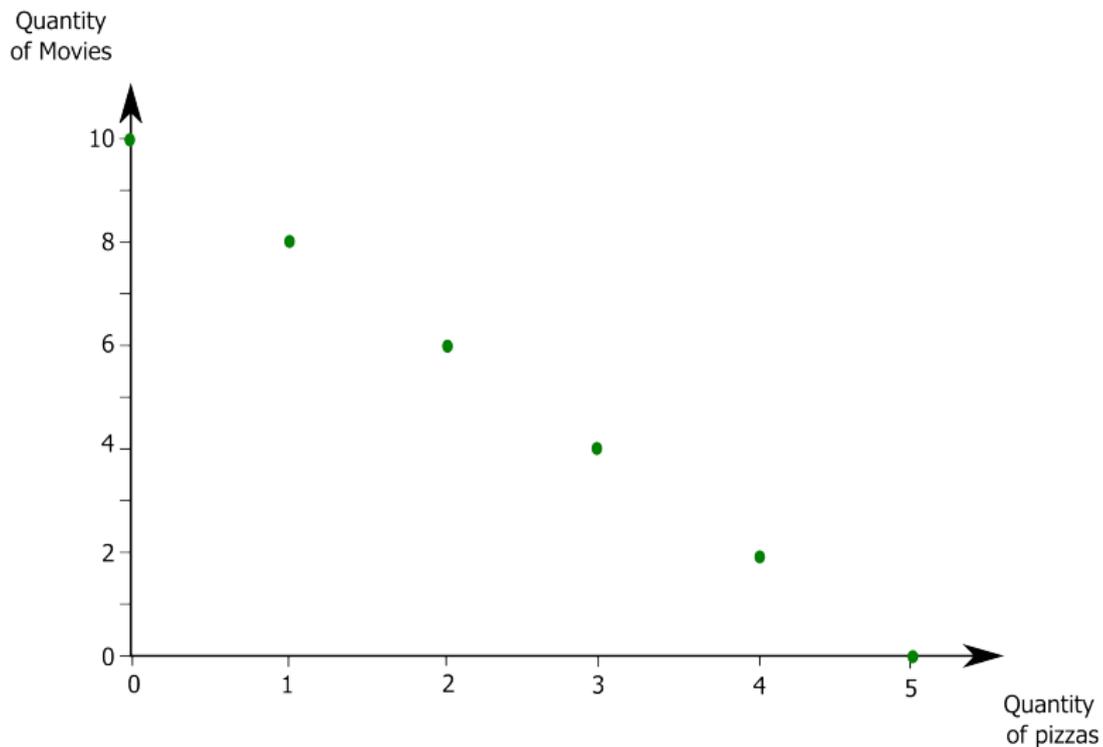
The Budget Line



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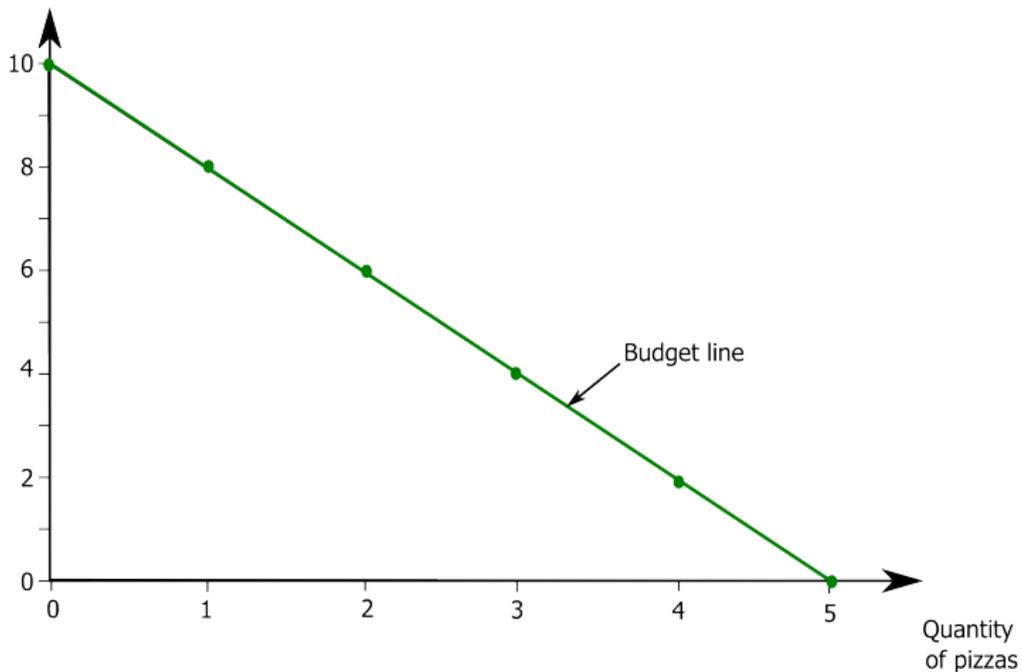


The Budget Line



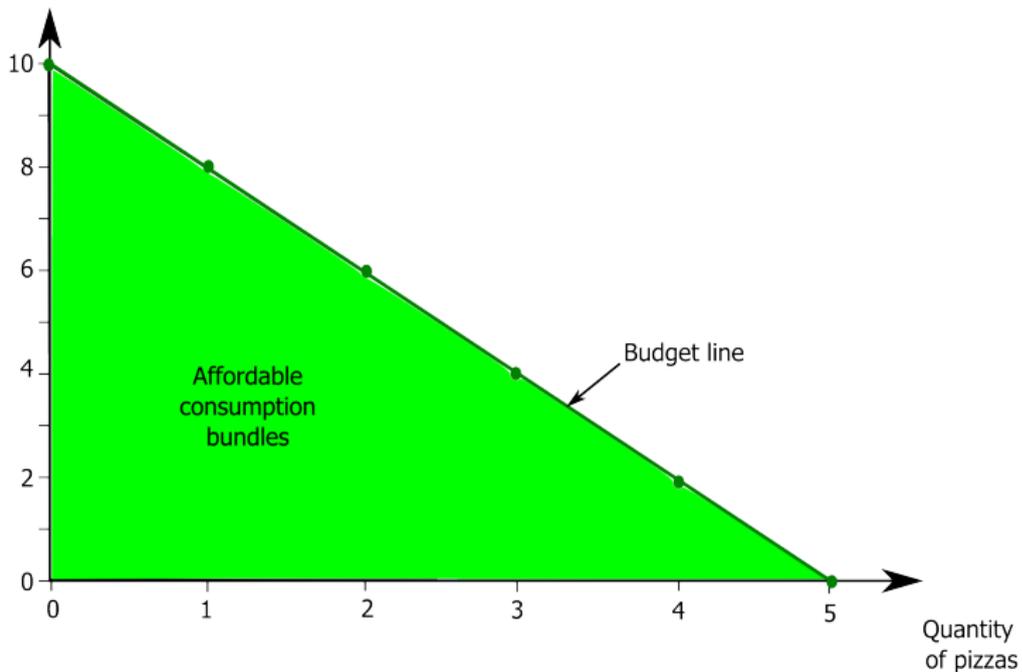
The Budget Line

Quantity
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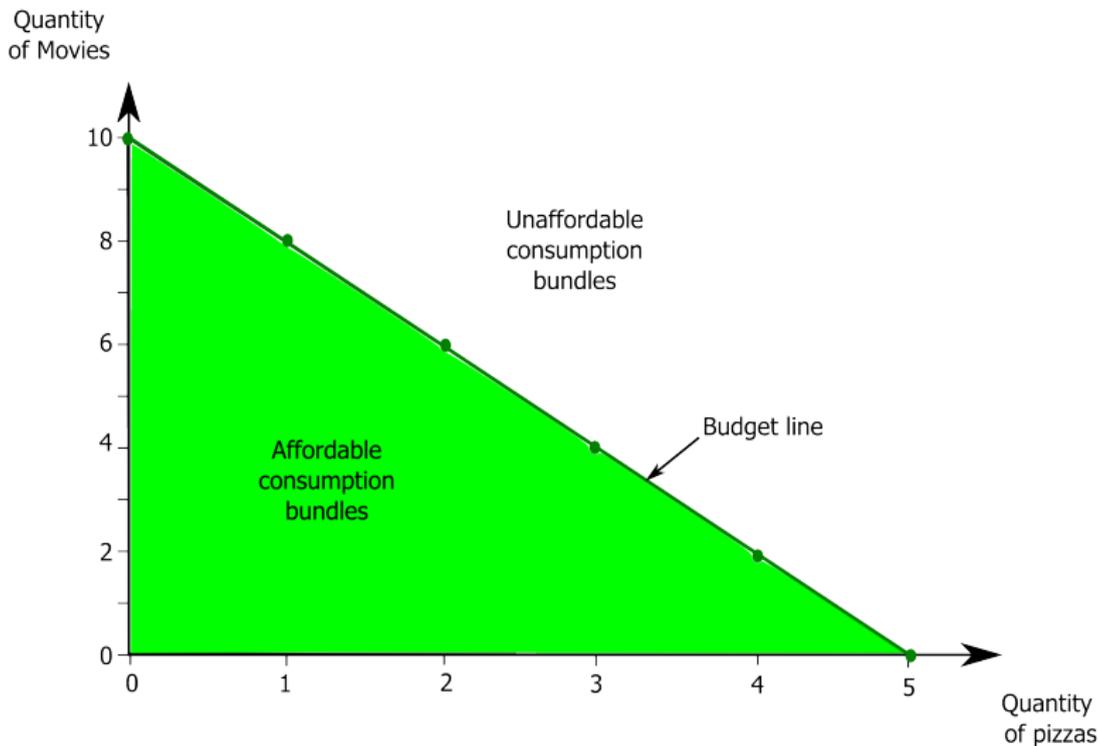


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The Budget Line



Aside: The Budget Line's Slope

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Ann must give up 2 movies to get 1 pizza.

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- If we combine information about preferences (marginal utility values) with information about what is affordable (the budget constraint) we can develop a useful rule to guide us to an individual's utility-maximizing choice:
 - The highest possible utility will be point for the consumers occurs when **the marginal utility per dollar** is the same for both goods
- To see this, we first need to know Anne's preferences towards movies.

Anne's Preferences Towards Movies

Number of Movies	Total Utility	Marginal Utility
0	0	

Anne's Preferences Towards Movies

Number of Movies	Total Utility	Marginal Utility
0	0	75

Anne's Preferences Towards Movies

Number of Movies	Total Utility	Marginal Utility
0	0	
1	75	75

Anne's Preferences Towards Movies

Number of Movies	Total Utility	Marginal Utility
0	0	
1	75	75
		42

Anne's Preferences Towards Movies

Number of Movies	Total Utility	Marginal Utility
0	0	
1	75	75
2	117	42

Anne's Preferences Towards Movies

Number of Movies	Total Utility	Marginal Utility
0	0	
1	75	75
2	117	42
3	153	36
4	181	28
5	206	25
6	225	19
7	243	18
8	260	17

Putting the Pieces Together

Pizza		Movies		
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	Total Utility

Putting the Pieces Together

Pizza		Movies		
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	Total Utility
5	175			

Putting the Pieces Together

Pizza		Movies		Total Utility
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	
5	175	0	0	

Putting the Pieces Together

Pizza		Movies		
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	Total Utility
5	175	0	0	175

Putting the Pieces Together

Pizza		Movies		
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	Total Utility
5	175	0	0	175
4	151			

Putting the Pieces Together

Pizza		Movies		
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	Total Utility
5	175	0	0	175
4	151	2	117	

Putting the Pieces Together

Pizza		Movies		
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	Total Utility
5	175	0	0	175
4	151	2	117	268

Putting the Pieces Together

Pizza		Movies		Total Utility
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	
5	175	0	0	175
4	151	2	117	268
3	121	4	181	302

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Pizza		Movies		Total Utility
Quantity (X_1)	Total Utility from Pizza	Quantity (X_2)	Total Utility from Movies	
5	175	0	0	175
4	151	2	117	268
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2	88	6	225	313

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5	175	0	0	175
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3	121	4	181	302
2	88	6	225	313
1	50	8	260	310

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5	175	0	0	175
4	151	2	117	268
3	121	4	181	302
2	88	6	225	313
1	50	8	260	310
0	0	10	291	291

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The Marginal Utility Per Dollar

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 - 2 How many additional movies she can see for each pizza she forgoes depends on the relative prices of pizzas and movies.

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 - 2 How many additional movies she can see for each pizza she forgoes depends on the relative prices of pizzas and movies.
- A useful way of thinking about her problem is the notion of the marginal utility per dollar obtained from each good.

The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0		

The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0	75	15

The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0		
1	75	15

The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0	75	15
1	42	8.4

The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0		
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The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0		
1	75	15
2	42	8.4
3	36	7.2

The Marginal Utility Per Dollar for Movies

Number of Movies	Marginal Utility	MU/\$
0		
1	75	15
2	42	8.4
3	36	7.2
4	28	5.6
5	25	5.0
6	19	3.8
7	18	3.6
8	17	3.4

The Marginal Utility Per Dollar for Pizzas

Number of Pizza	Marginal Utility	MU/\$
0		
1	50	5.0
2	38	3.8
3	33	3.3
4	29	2.9
5	25	2.5

Pizza (\$10)			Movies (\$5)		
Quantity	Marginal Utility	MU/\$	Quantity	Marginal Utility	MU/\$

Pizza (\$10)			Movies (\$5)		
Quantity	Marginal Utility	MU/\$	Quantity	Marginal Utility	MU/\$
5	25	2.5	0		

Pizza (\$10)			Movies (\$5)		
Quantity	Marginal Utility	MU/\$	Quantity	Marginal Utility	MU/\$
5	25	2.5	0		
4	29	2.9	2	42	8.1

Pizza (\$10)			Movies (\$5)		
Quantity	Marginal Utility	MU/\$	Quantity	Marginal Utility	MU/\$
5	25	2.5	0		
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0			10	15	3.0

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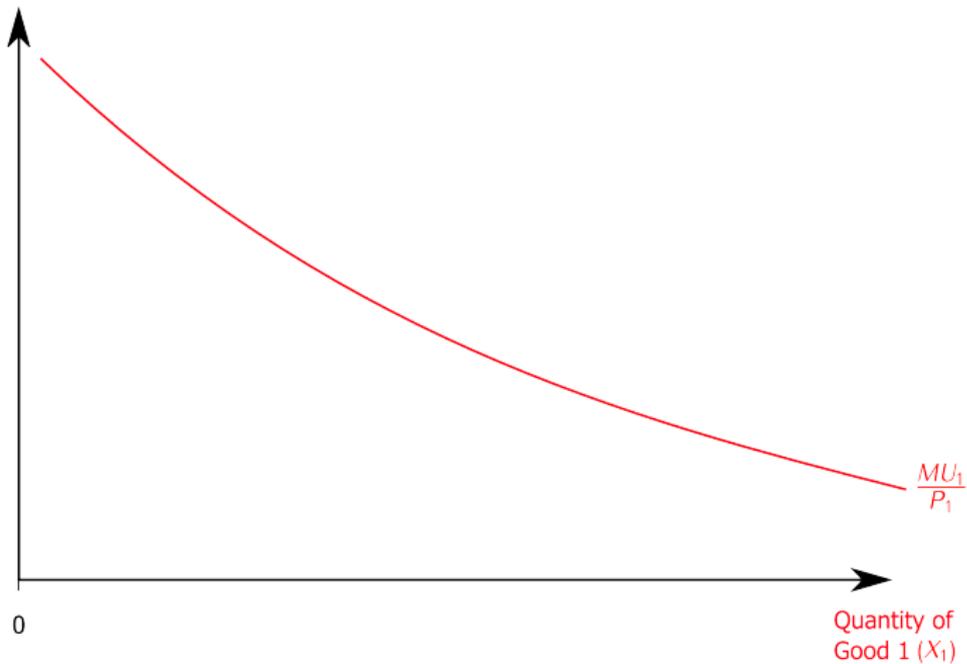
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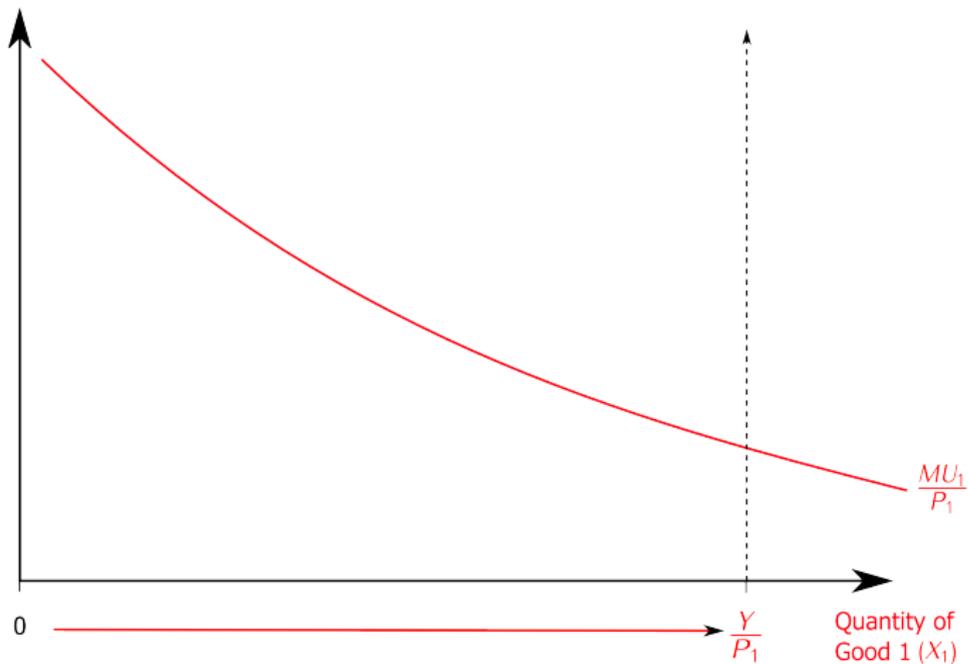
- Anne's optimal consumption bundle occurs when the marginal utility per dollar spent is the same for both goods.
- This is known as the **optimal consumption rule**:

$$\frac{MU_1}{P_1} = \frac{MU_2}{P_2} \quad (2)$$

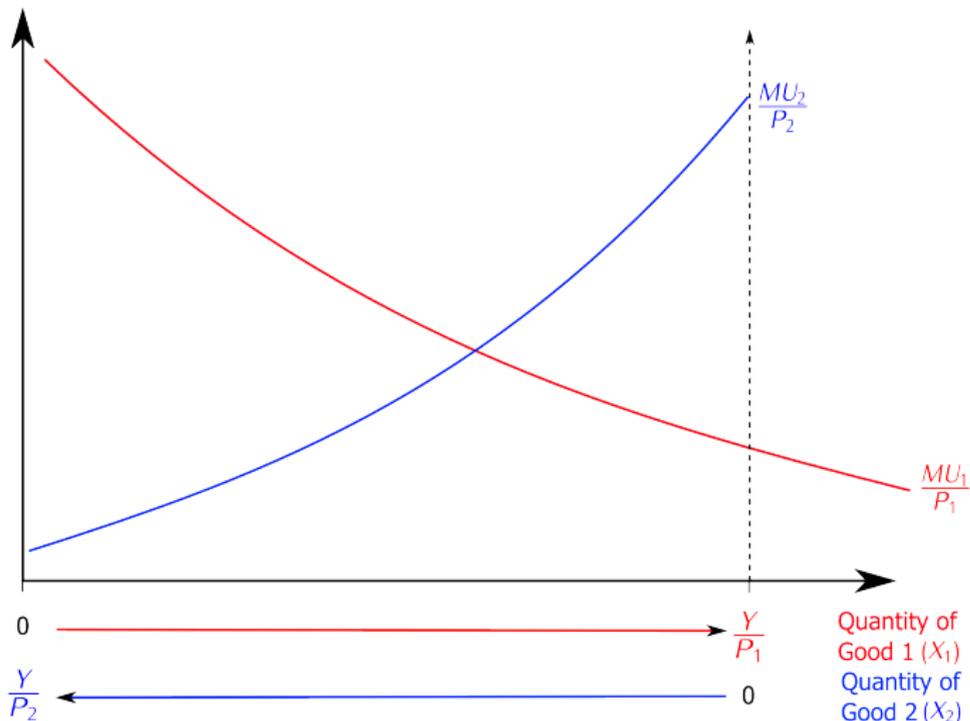
Graphically

Marginal
Utility per
Dollar

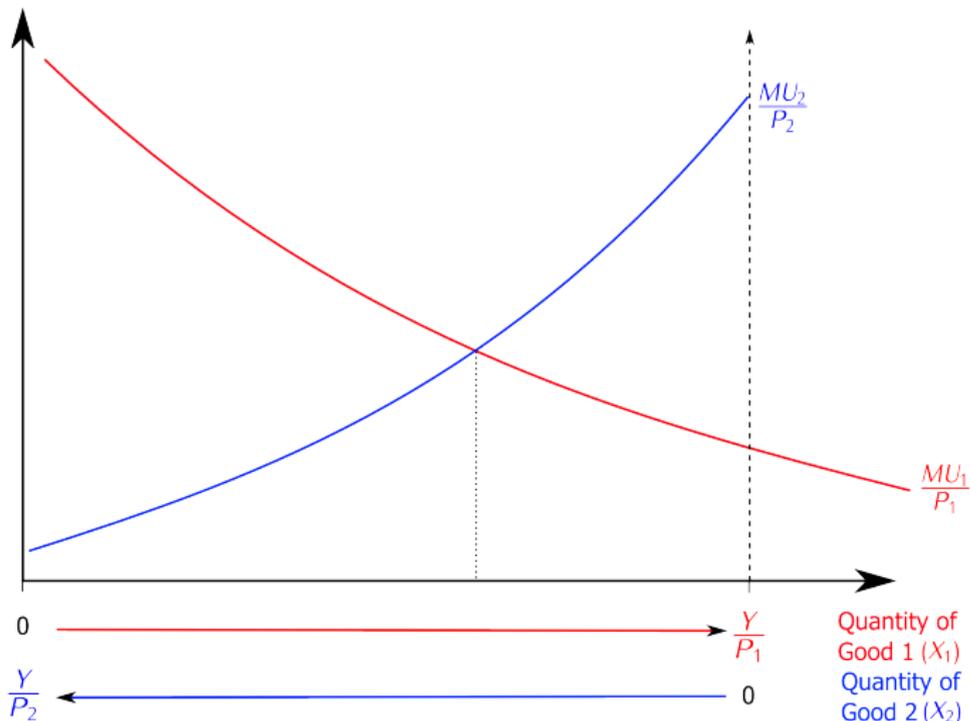
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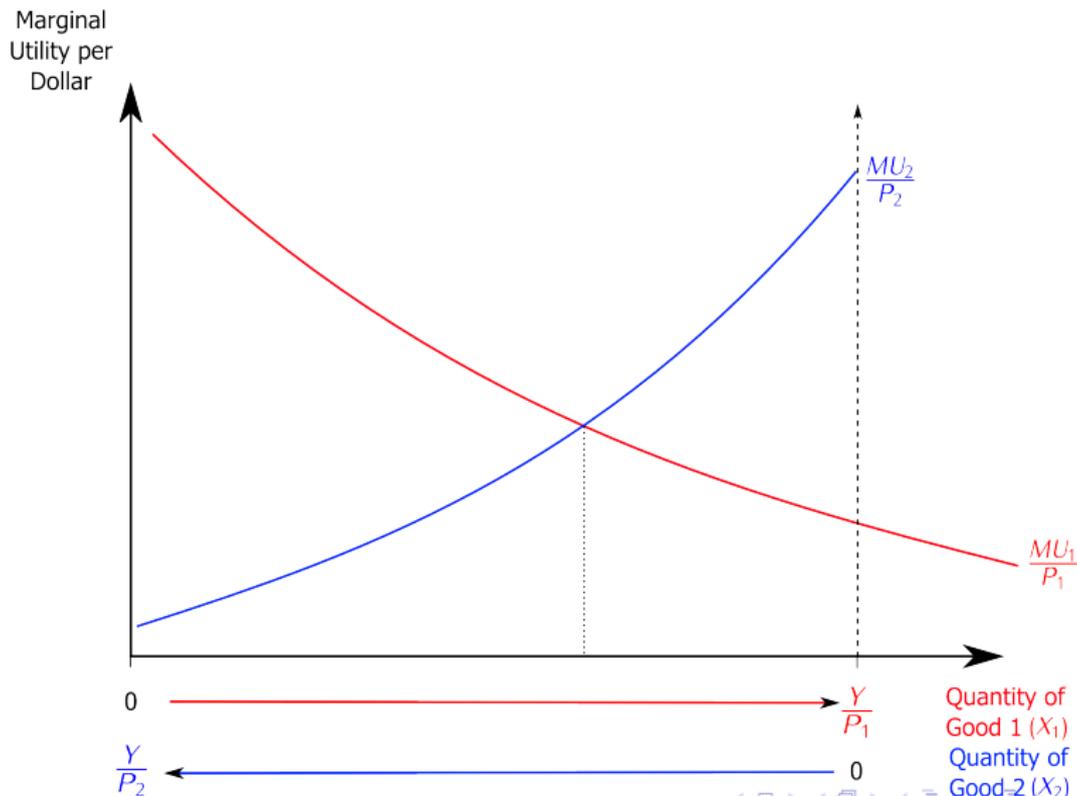
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 - ... but the marginal utility (i.e., $\frac{MU_i}{P_i}$) per dollar does decline

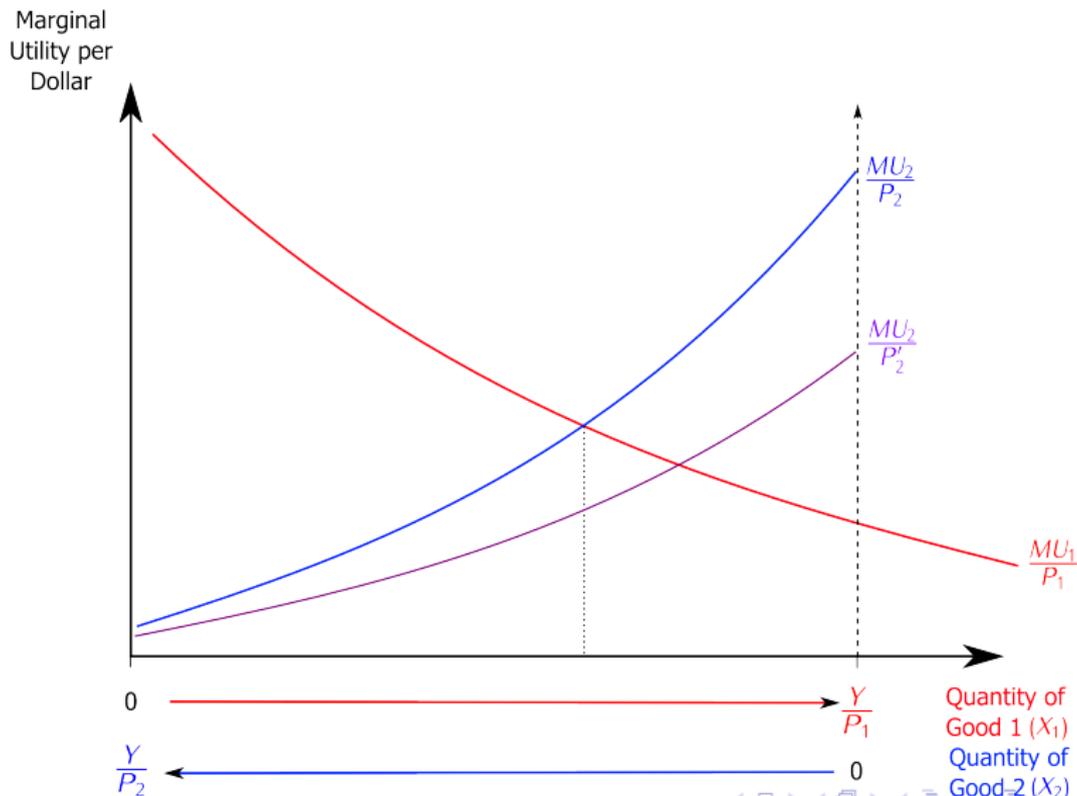
Marginal Utility and Demand

What happens to the quantity demanded for good 2 as its price increases?



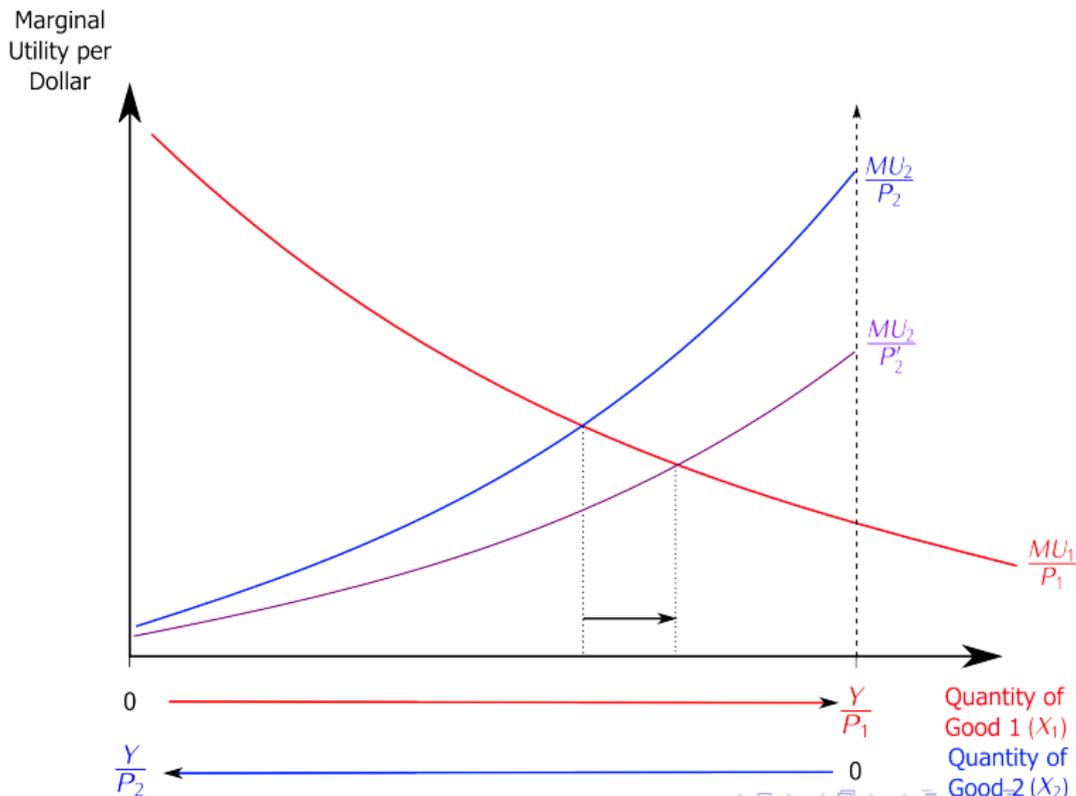
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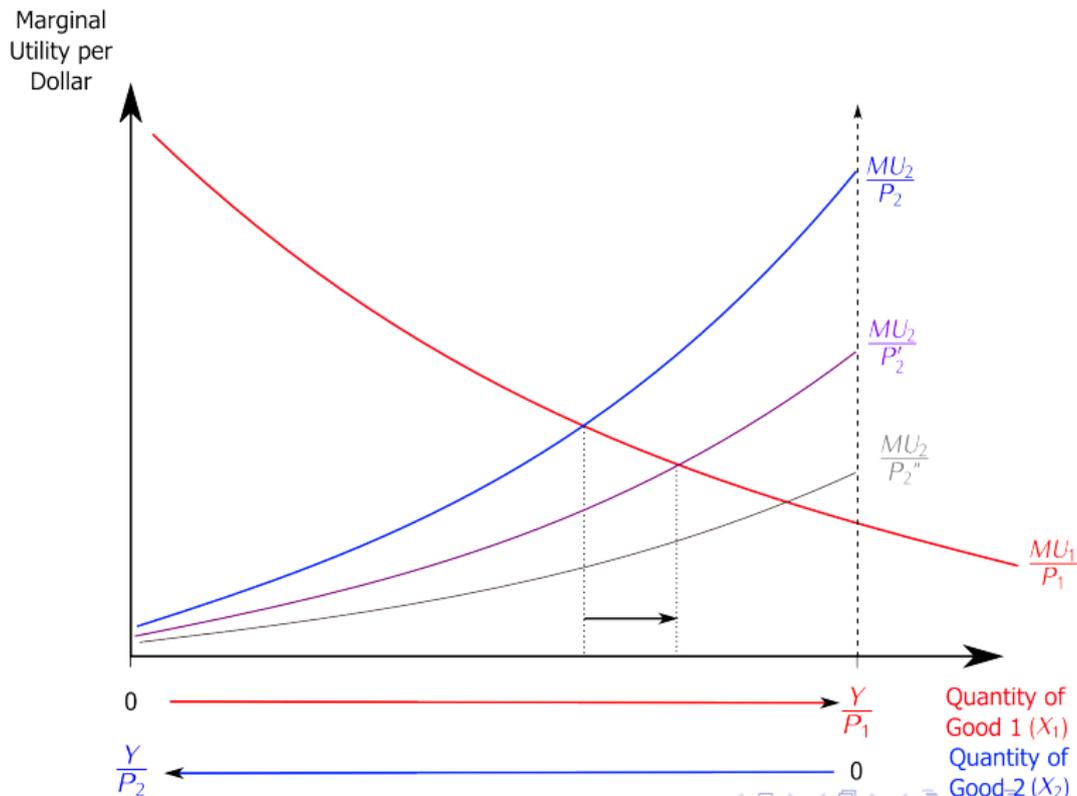
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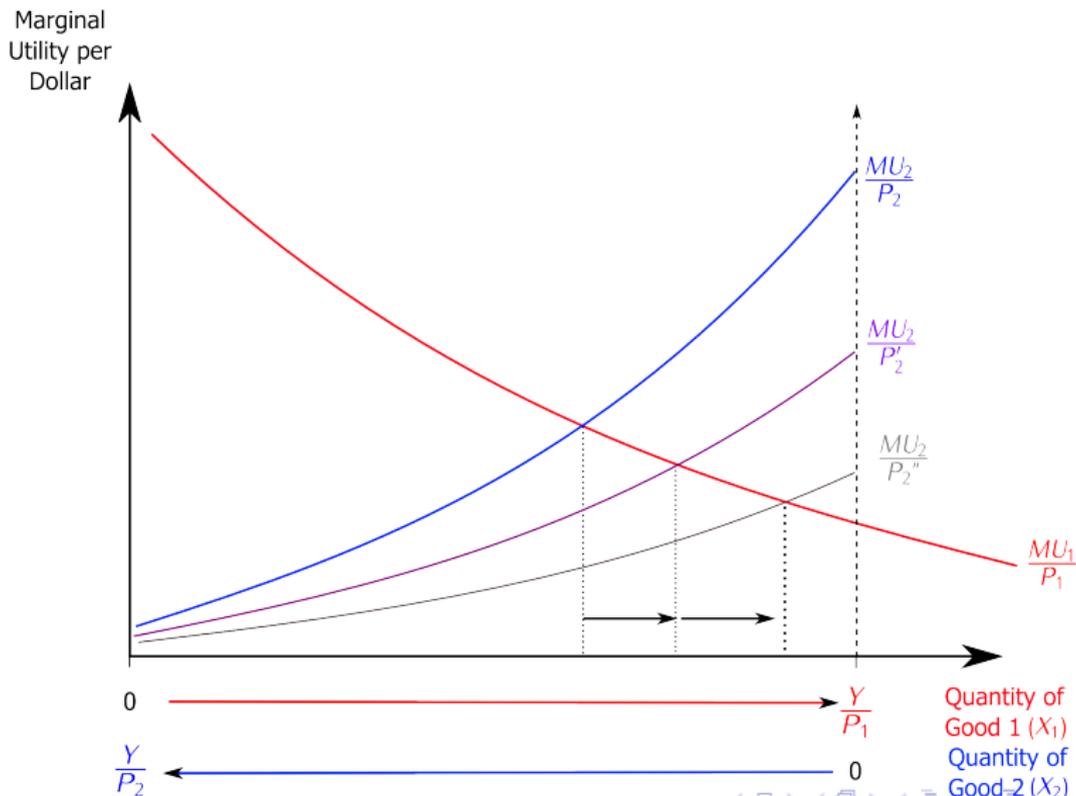
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 - With a drop in price, the individual can purchase the same bundle of goods as they did before and have money left over.
 - It is as if their income has gone up by the savings due to the price decrease.
 - For most cases, this *income effect* is small.

The Substitution and Income Effects

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 - As the price of good 2 increased, the individual substituted away from good
 - Consuming more of good 1.
 - For example, in the case of Anne, an increase in the price of pizza would cause her to substitute away from pizza and towards more movies.
- There is another consequence of a price change, known as the **income effect**
 - With a drop in price, the individual can purchase the same bundle of goods as they did before and have money left over.
 - It is as if their income has gone up by the savings due to the price decrease.
 - For most cases, this *income effect* is small.
 - However, for big ticket items (such as housing), the income effect of a price reduction can be large.

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