Consumer Theory

Content

(1) Consumption and Utility

(2) Cardinal Approach

(3) Ordinal Approach

(4) Creating Demand Curve from Consumer Behavior

1. Consumption and Utility

1.1 Where does our needs come from?

1. Consumption and Utility

1.2 Utility

3.1 Definition – Utility

Utility is pleasure received when people consume a good or service within a period of time.

Q & A

(1) Does a good or service offer the same amount of utility for different people?

(2) Are utility and usefulness the same?

2. Cardinal Approach

2.1 Assumptions

(1) Consumers are rational decision makers.

(2) Utility can be numerically defined, also additive, countable and has a unit of **Util.**

(3) For a good or service, its quality remains the same for every unit.

(4) Good and service is indefinitely divisible.

(5) Other things being equal.

3.2 Definition – Utility Maximization

If a consumer is a rational decision maker, utility maximization is a process he or she trying to achieve.

2. Cardinal Approach

2.2 Total, marginal utility

3.3 Definition – Total Utility (TU)

Total utility a consumer received from consuming a good or service for n unit.

$$TU_n = \sum_{i=1}^{n} MU_i$$

3.4 Definition – Marginal Utility (MU)

Additional utility received when consuming 1 more unit of good or service.

$$MU_n = TU_n - TU_{n-1} \qquad MU_n = \frac{\Delta TU}{\Delta x} = \frac{dTU}{dx}$$

2. Cardinal Approach

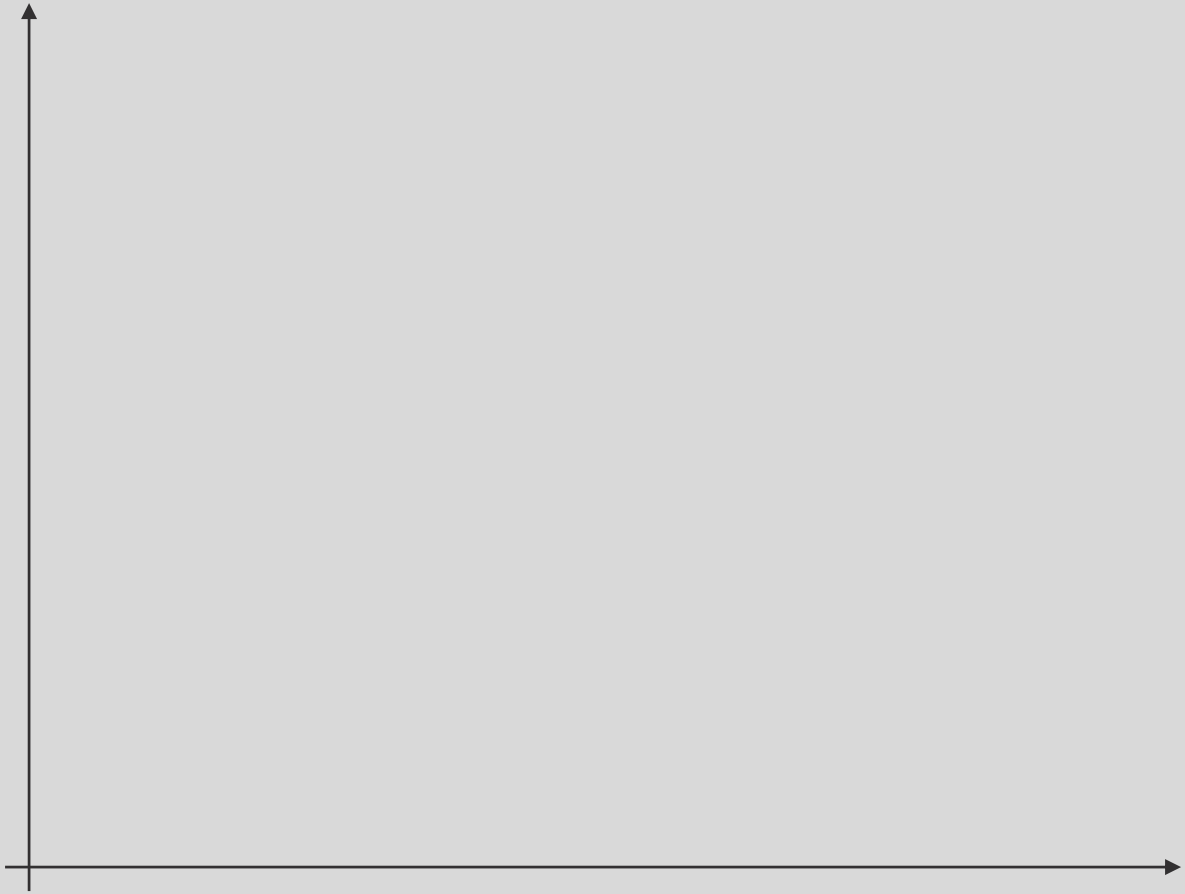
2.2 Total, marginal utility

Finding total utility			Finding marginal utility		
x	TU	MU	x	TU	MU
0	0	-	0	0	-
1		4	1	5	
2		2	2	8	
3		1	3	9	
4		0	4	10	
5		-1	5	10	
6		-2	6	8	

2. Cardinal Approach

2.2 Total, marginal utility

TU and MU curve



2. Cardinal Approach

2.2 Total, marginal utility

3.4 Definition – Law of Diminish Marginal Utility

When a consumer consumes a good or service continually within a period of time, marginal utility diminishes.

Q & A **Why?**

(1) Sitting in a lecture hall for 3 hours.

(2) Having lunch.

(3) Watching Korean TV series.

Does this rule apply to every good and service consumption?

2. Cardinal Approach

2.3 Utility maximization

3.5 Definition – Utility Maximization Problem

A problem which a consumer seeks the **optimum** amount of good or service to consume.

Things to consider

(1) Utility received from each good or service.

(2) Good or service price.

(3) Consumer budget constraint.

2. Cardinal Approach

2.3 Utility maximization

Case 1: When consumer has unlimited budget.

Consumer will consume each good or service up until all the marginal utility becomes zero.

$$MU_{x_1} = MU_{x_2} = \cdots = MU_{x_k} = 0$$

x_1, x_2	$TU(x_1)$	$MU(x_1)$	$TU(x_2)$	$MU(x_2)$
1	5		15	
2	8		25	
3	10		30	
4	10		35	
5	8		35	
6	5		30	

2. Cardinal Approach

2.3 Utility maximization

Case 2: When consumer has limited budget.

Consumer will consume each good or service up until marginal utility to price ratio becomes

$$\frac{MU_{x_1}}{P_{x_1}} = \frac{MU_{x_2}}{P_{x_2}} = \cdots = \frac{MU_{x_k}}{P_{x_k}}$$

I	x,y	MU_x	P_x	MU_y	P_y	MU_x/P_x	MU_y/P_y	**Decision**
22	1	12	4	10	2			
	2	8		8				
	3	4		6				
	4	0		4				
	5	-4		2				
	6	-8		0				

2. Cardinal Approach

2.4 Summary

3.1 Proposition – Utility and Cardinal Approach

- Utility is pleasure received from consuming good or service.
- With the assumption of being rational, people seek to maximize their utility.
- Marginal utility to price is used to consider optimal condition.
- Cardinal approach is flawed due to its inconsistency of utility variation from person to person, therefore, additive property is not reliable.

3. Ordinal Approach

3.1 Assumptions

(1) Ordinal approach does not require defining certain amount of utility received. This approach focuses on analyzing two substitutable goods.

(2) Consumer is rational decision makers seeking to maximize utility.

- Completeness: consumer prefers a good or service to another.

- Transitivity: consumer's preference is transitive.

(3) For a good or service, its quality remains the same for every unit.

(4) Good and service is indefinitely divisible. (continuous property)

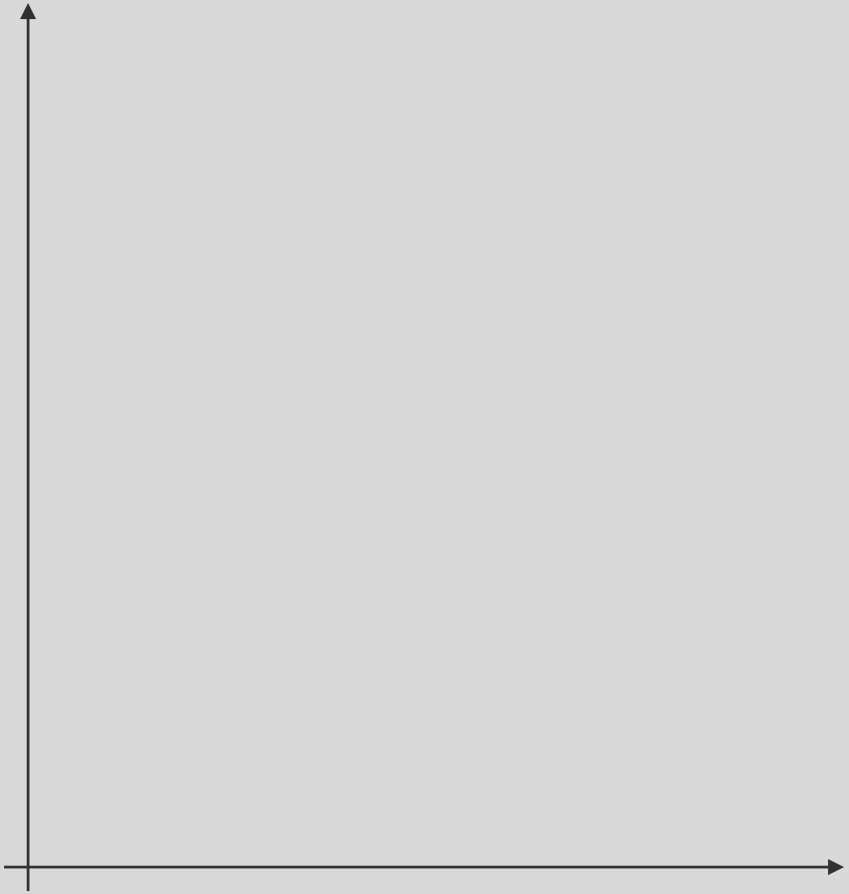
(5) Within consumer's budget constraint, consumer is assumed to be non-satiated. (Walras' Law)

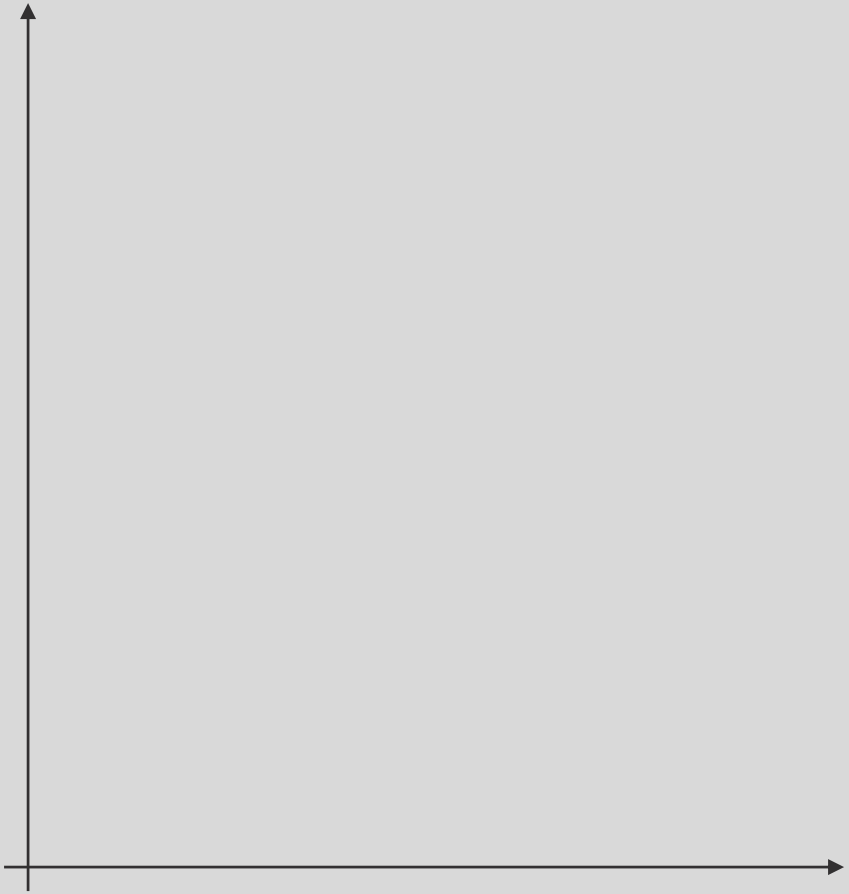
(6) Other things being equal.

3. Ordinal Approach

3.1 Assumptions

Non-satiated property





3. Ordinal Approach

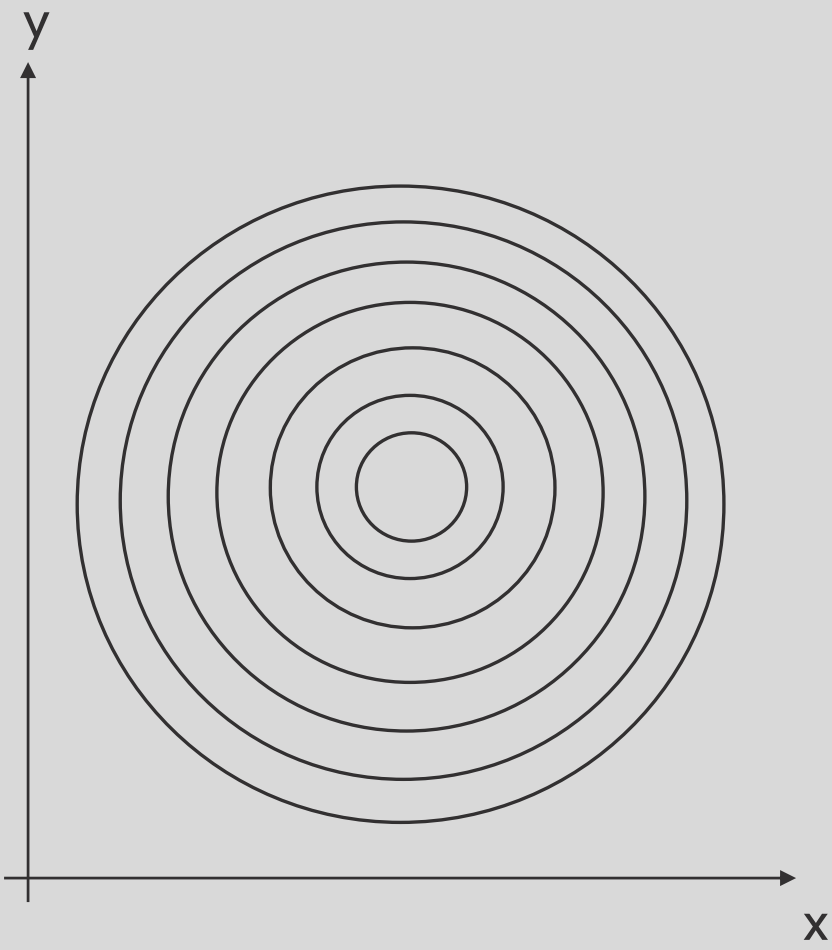
3.2 Indifferent Curve

Definition – Indifferent Curve

3.6 is a curve that shows various combinations of two goods or services, which provide the same level of utility.

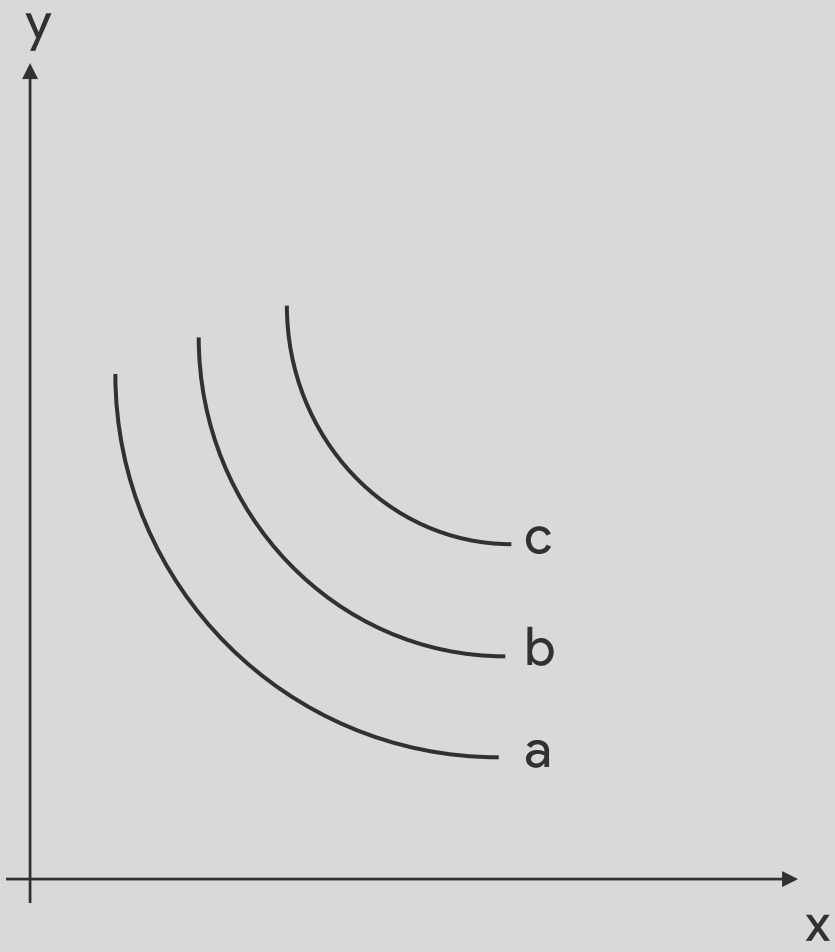
3. Ordinal Approach

3.2 Indifferent Curve

Indifferent Curve	Note
	

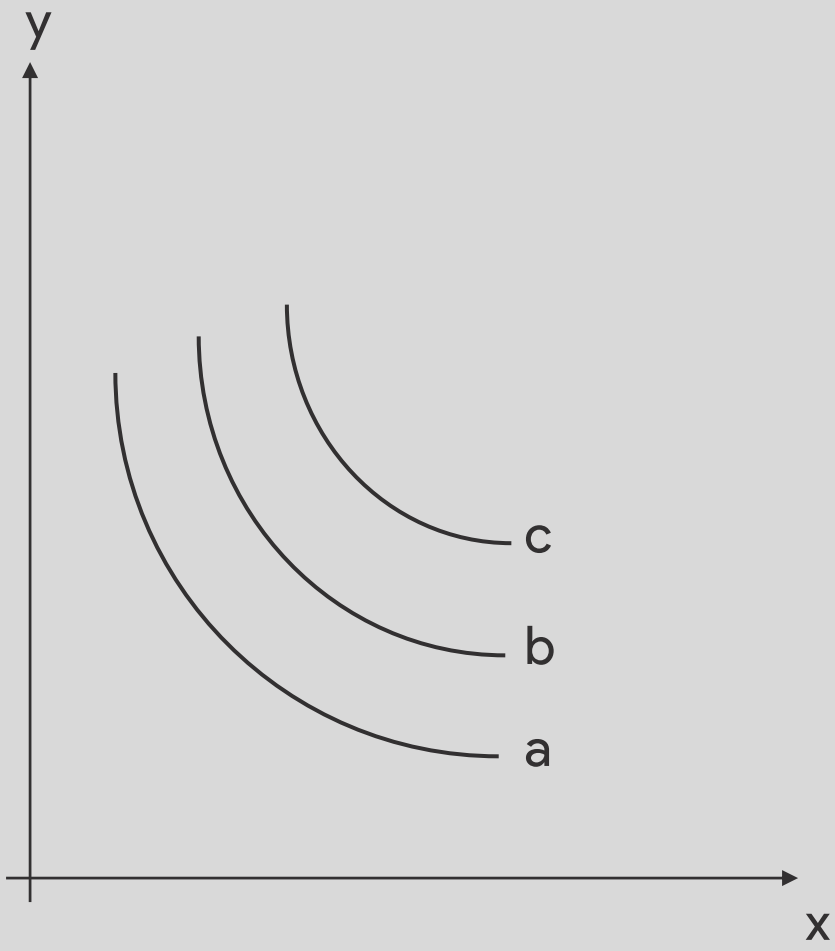
3. Ordinal Approach

3.3 Properties of Indifferent Curve

Indifferent Curve	Note
	

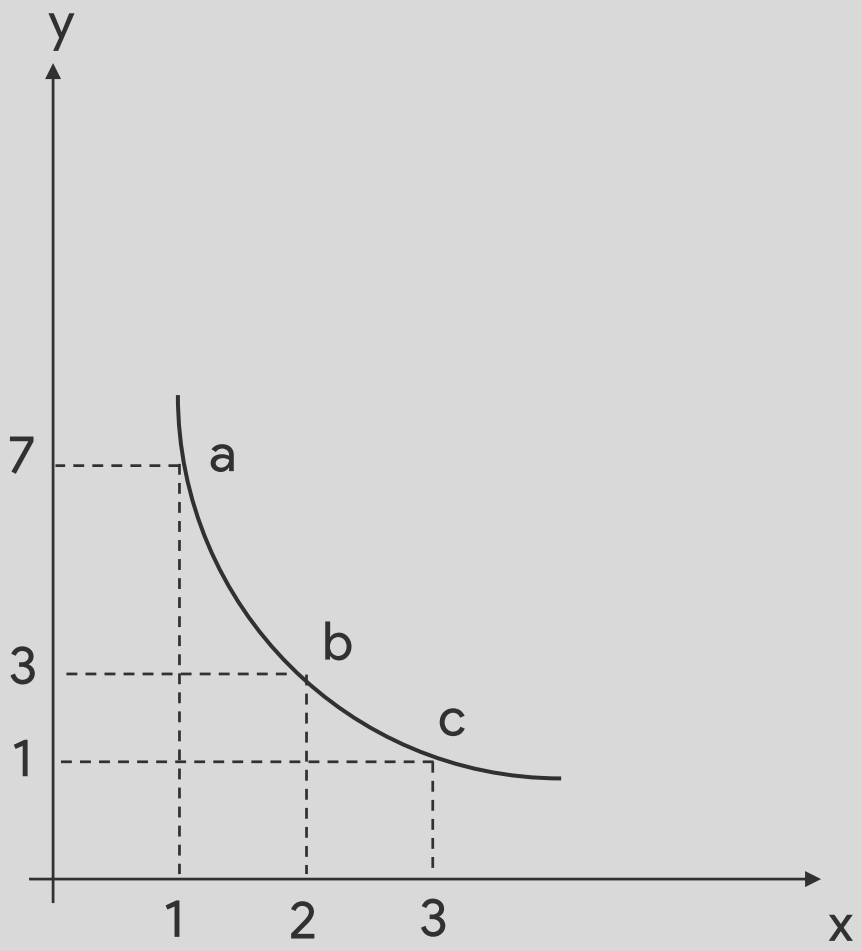
3. Ordinal Approach

3.3 Properties of Indifferent Curve

Indifferent Curve	Note
	(1) Order of utility (2) ICs cannot cross (3) Convexity property for normal goods

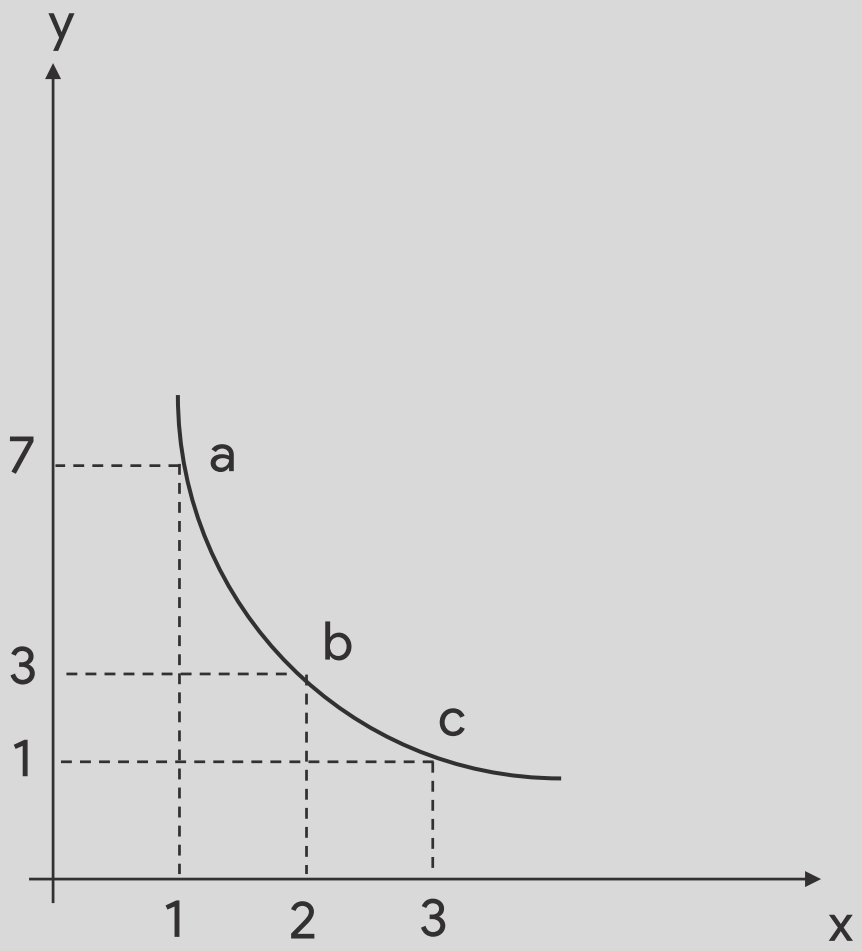
3. Ordinal Approach

3.3 Properties of Indifferent Curve

Indifferent Curve	Substitutable property
	

3. Ordinal Approach

3.3 Properties of Indifferent Curve

Indifferent Curve	Substitutable property
	

3. Ordinal Approach

3.4 Marginal Rate of Substitution

3.7 Definition – Marginal Rate of Substitution

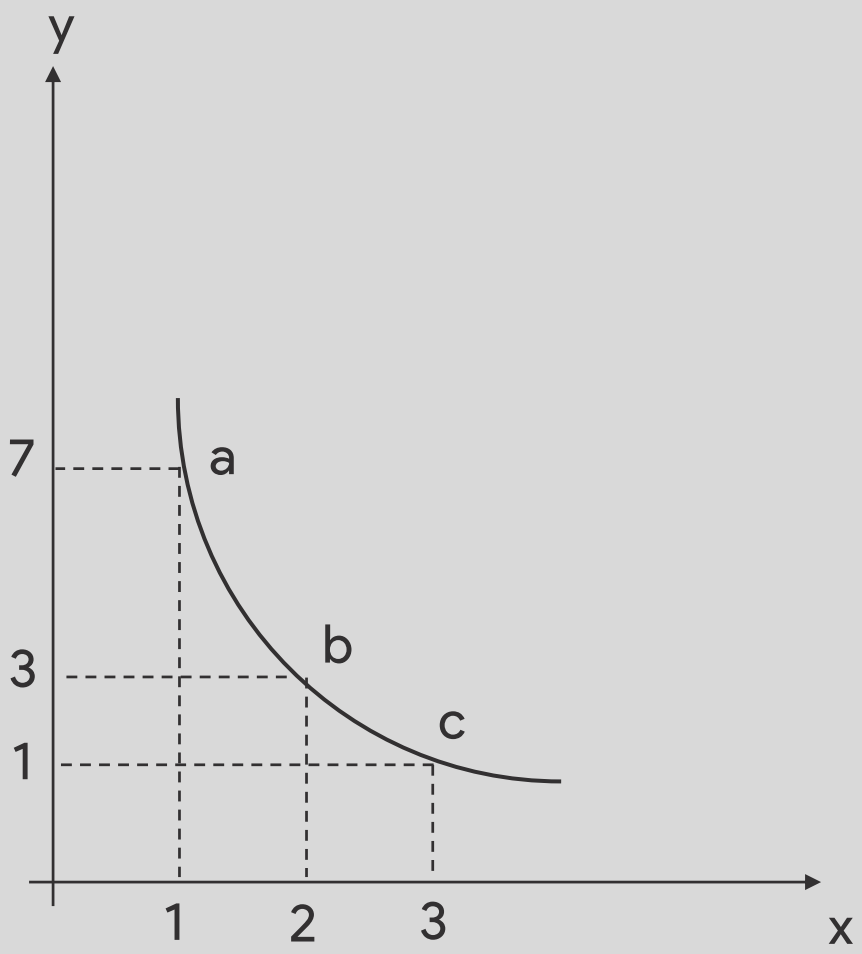
is a ratio of amount of good y to amount of good x that provide the same amount of utility from one point to another on the same indifferent curve.

$$MRS_{xy} = \frac{\Delta y}{\Delta x} = \frac{MU_x}{MU_y}$$

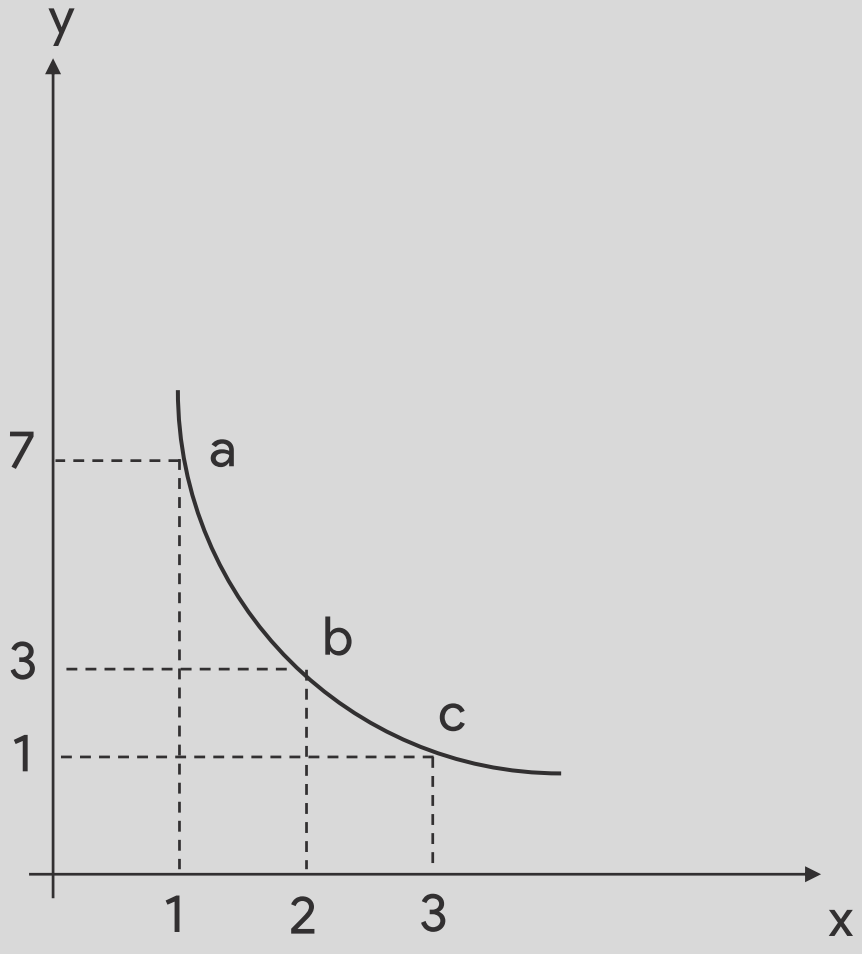
3. Ordinal Approach

3.4 Marginal Rate of Substitution

MRS_{xy}



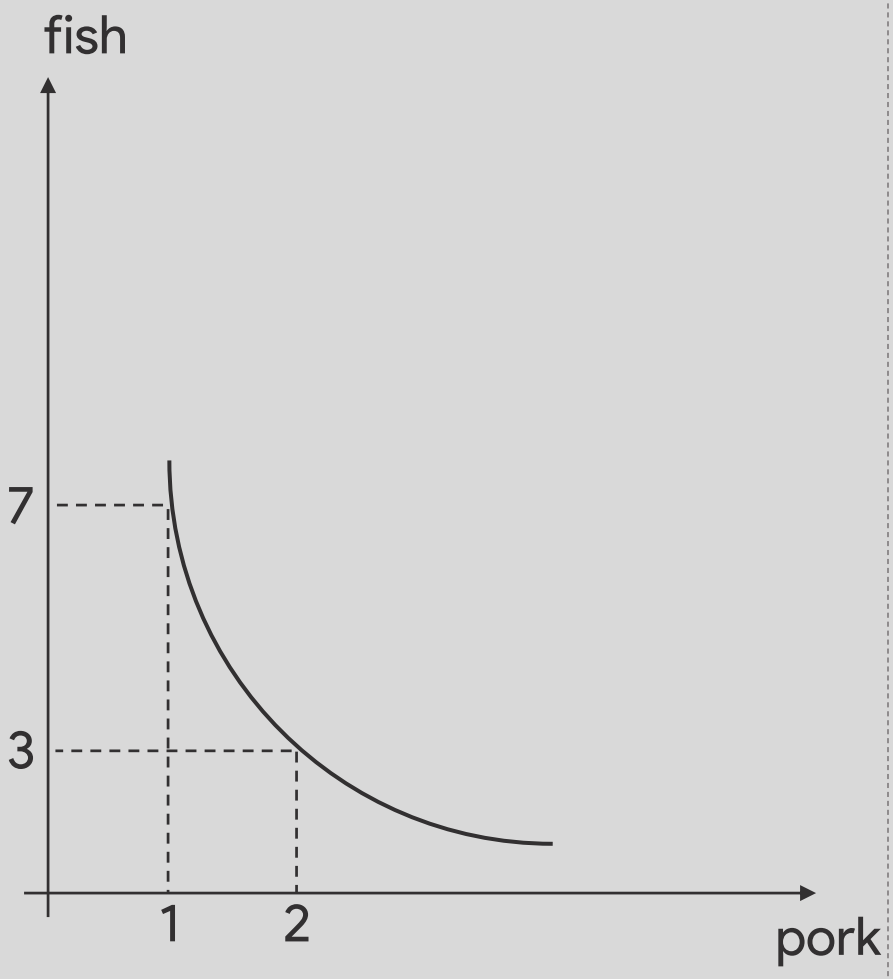
MRS_{yx}



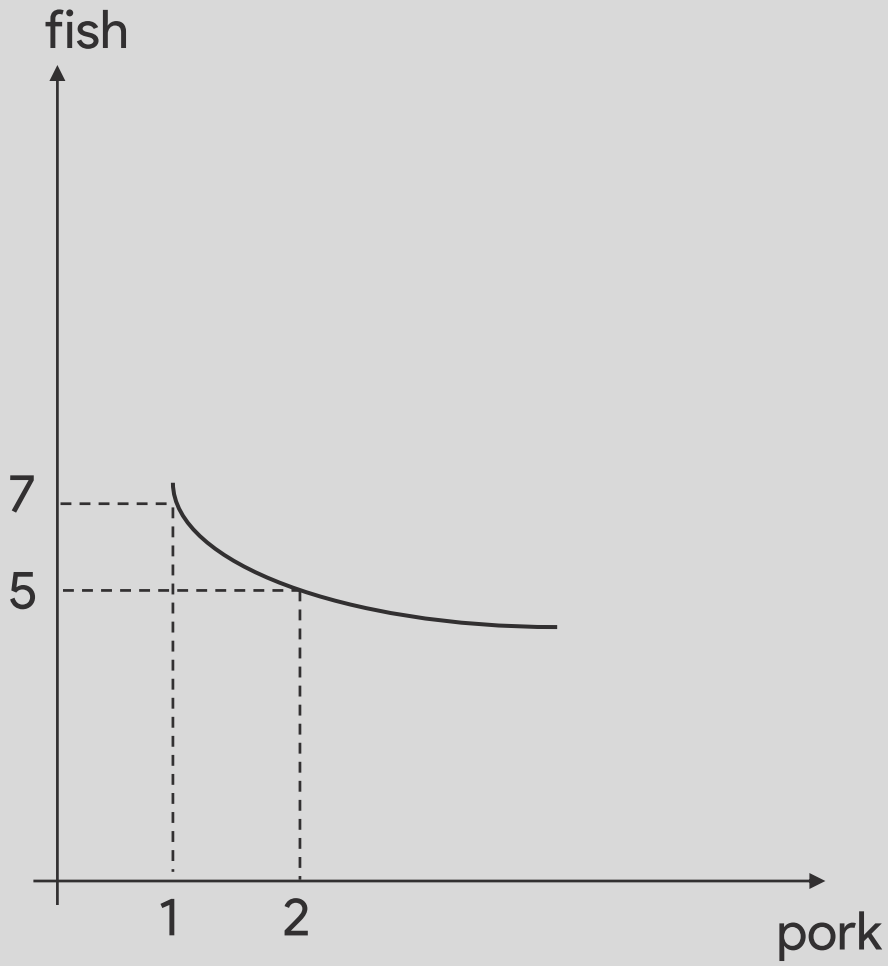
3. Ordinal Approach

3.4 Marginal Rate of Substitution

Consumer prefers pork.



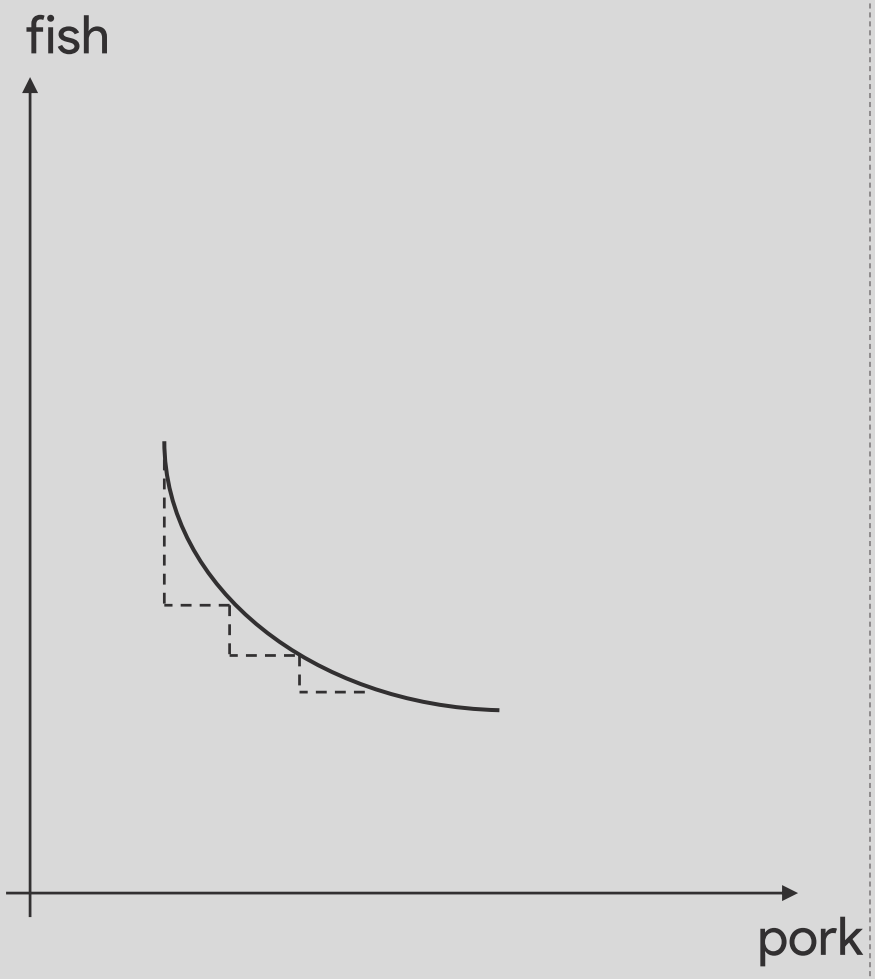
Consumer prefers fish.



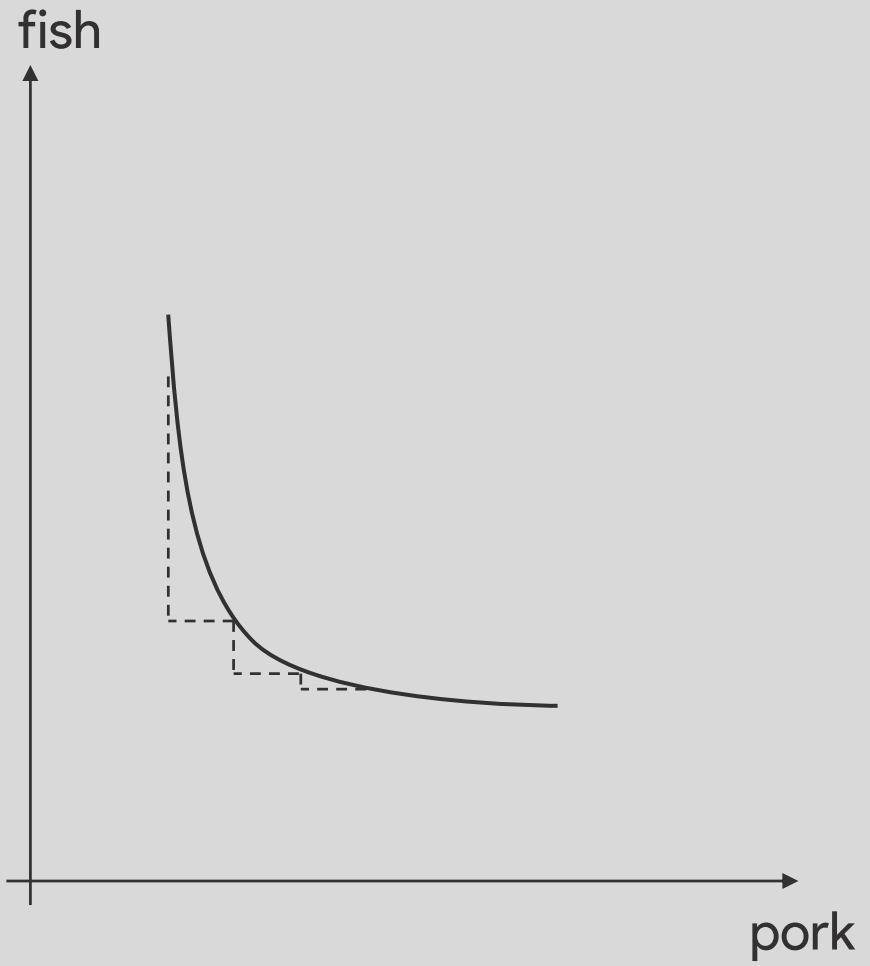
3. Ordinal Approach

3.4 Marginal Rate of Substitution

Consumer prefers both similarly.



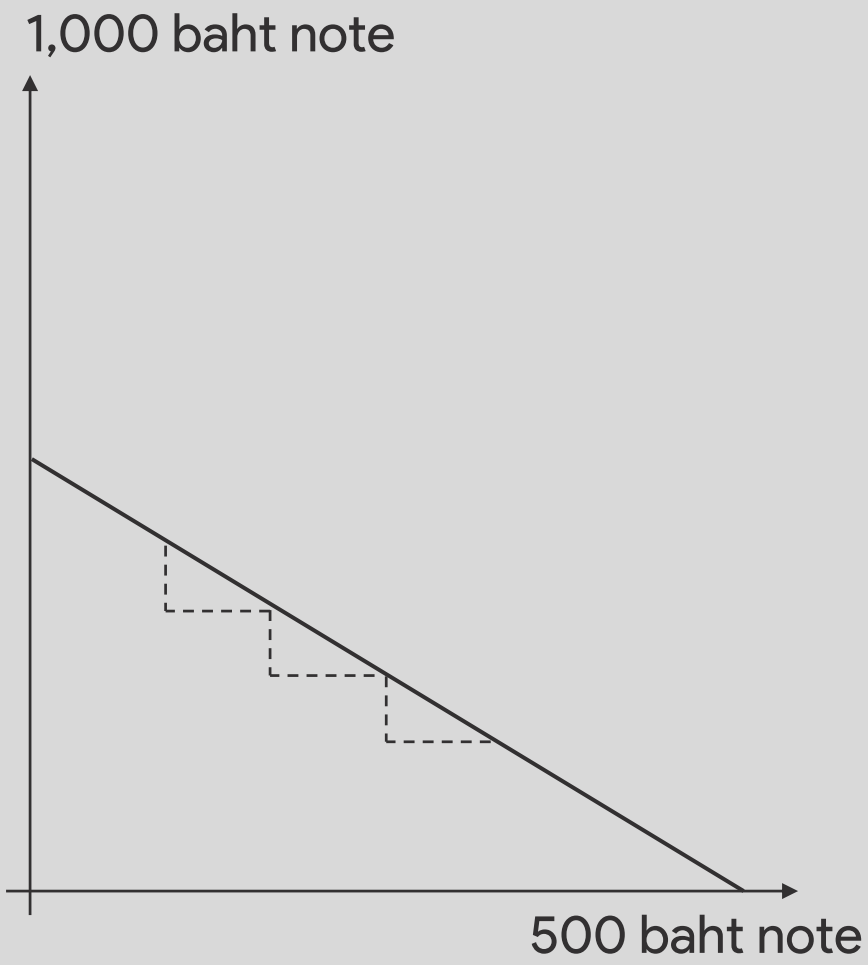
Consumer prefers one or another.



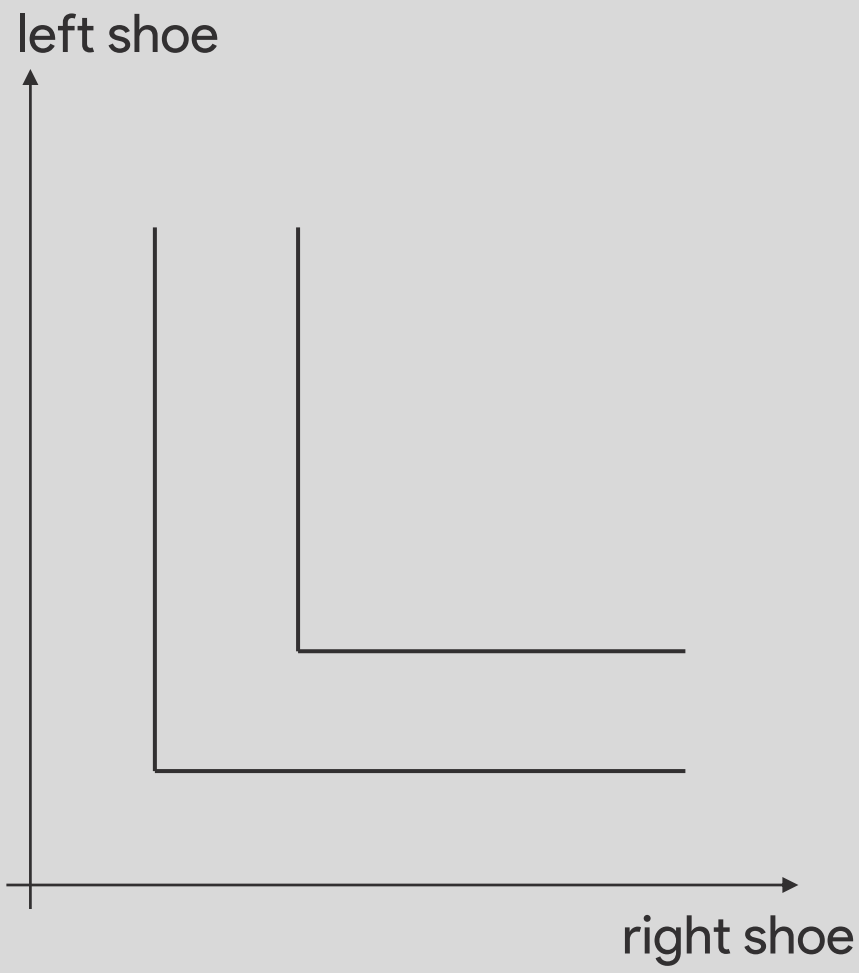
3. Ordinal Approach

3.4 Marginal Rate of Substitution

Perfectly substitutable goods



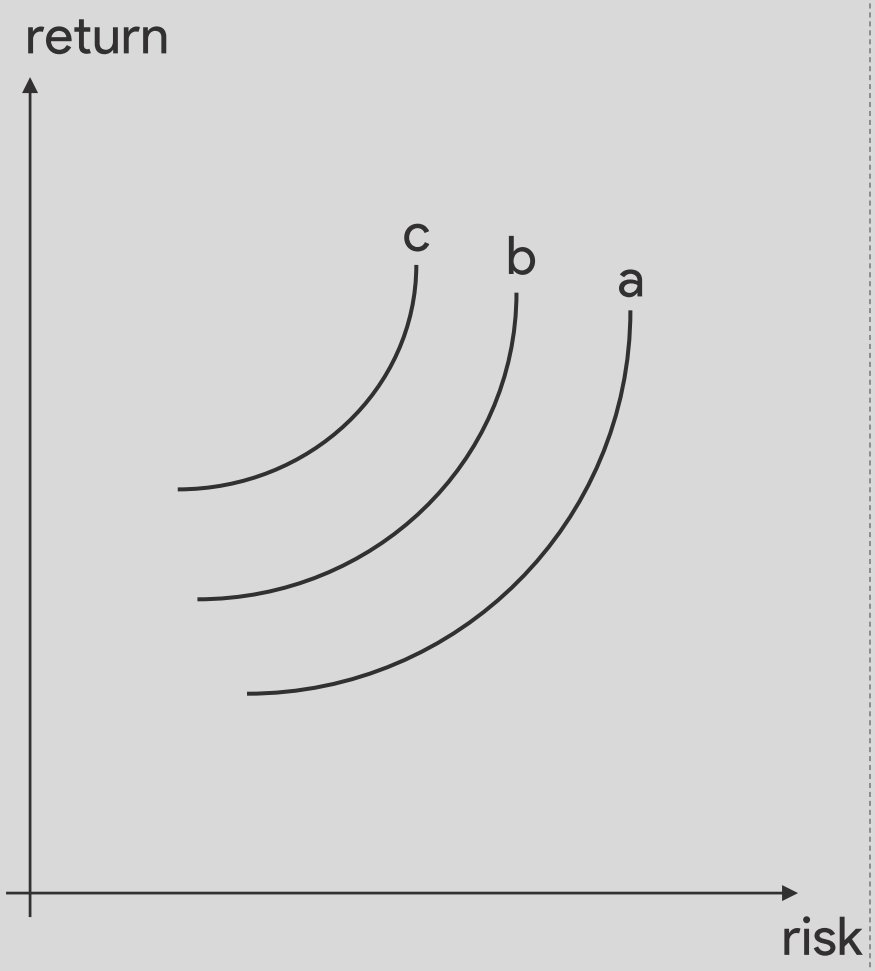
Perfectly complementary goods



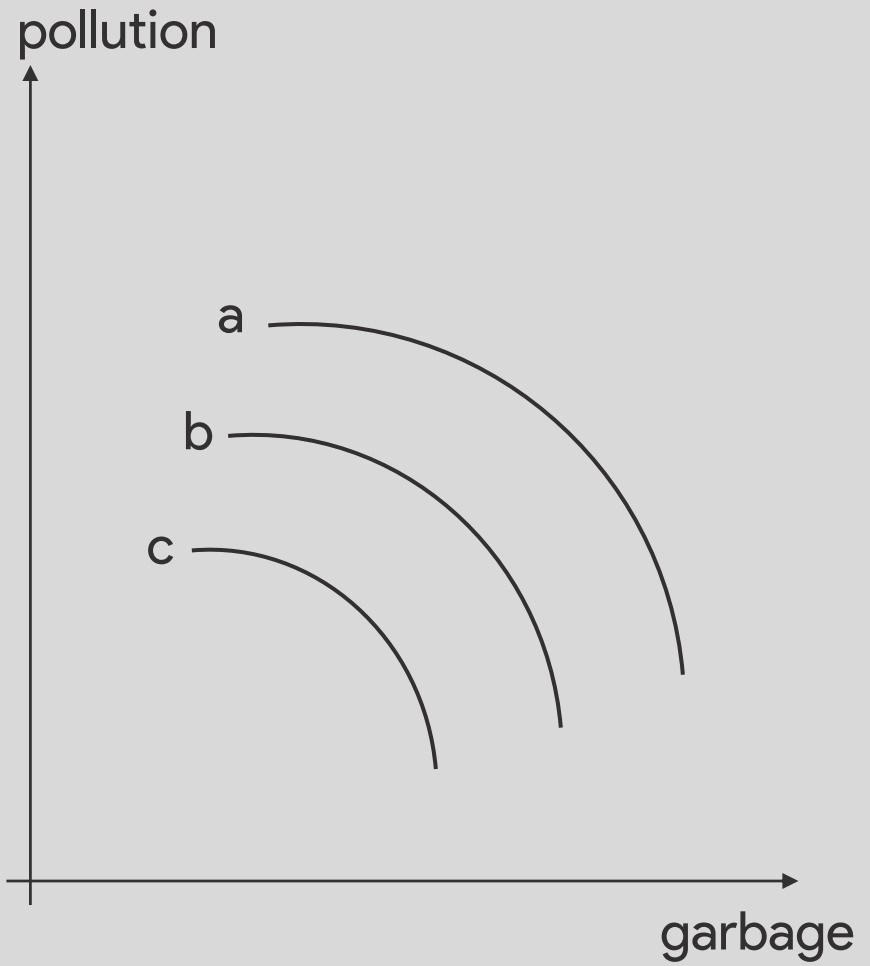
3. Ordinal Approach

3.4 Marginal Rate of Substitution

Good and bad



Bads



3. Ordinal Approach

3.5 Budget Line

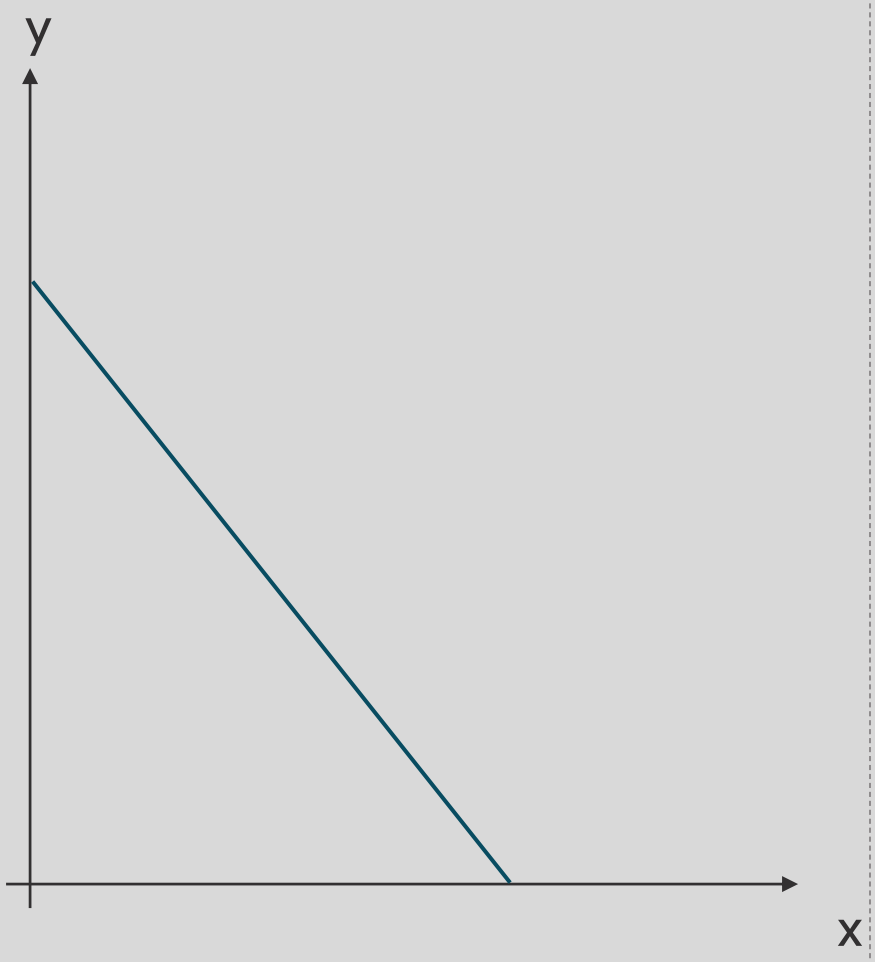
3.8 Definition – Budget Line

is a frontier of consumption which consumer can afford to consume with a budget constraint.

$$I = P_x \cdot x + P_y \cdot y$$

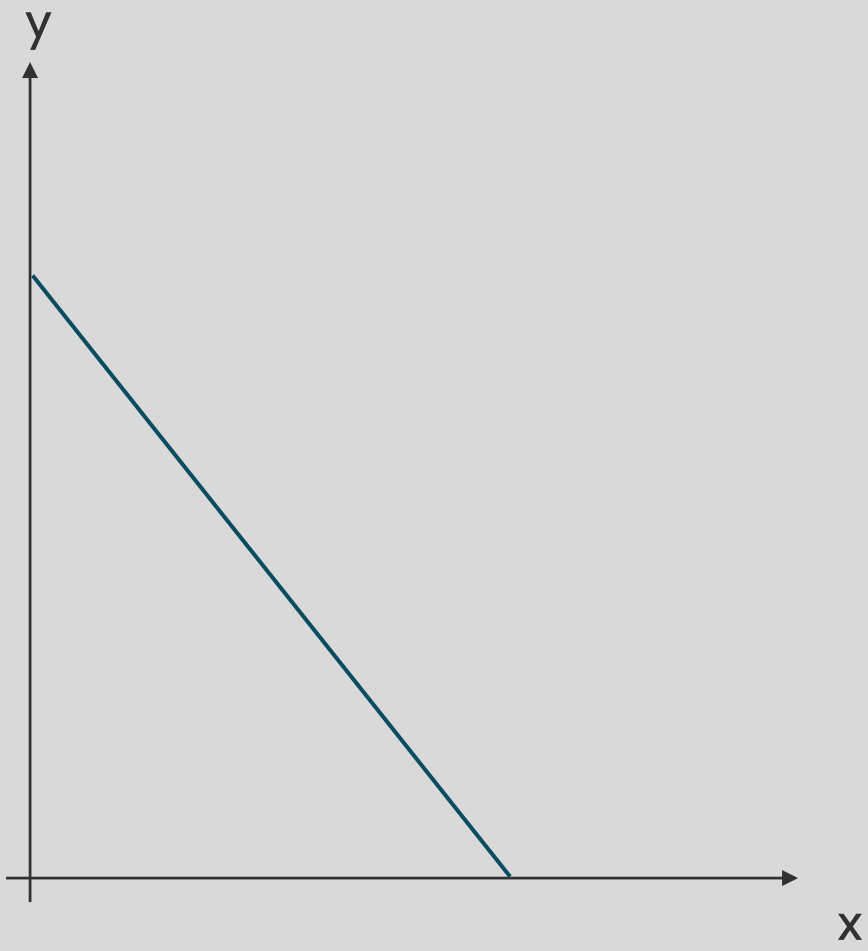
3. Ordinal Approach

3.5 Budget Line

Budget line	Example
	Supposed that a consumer has a limited budget of 500 baht, each unit of good x is 50 baht and 20 baht for good y.

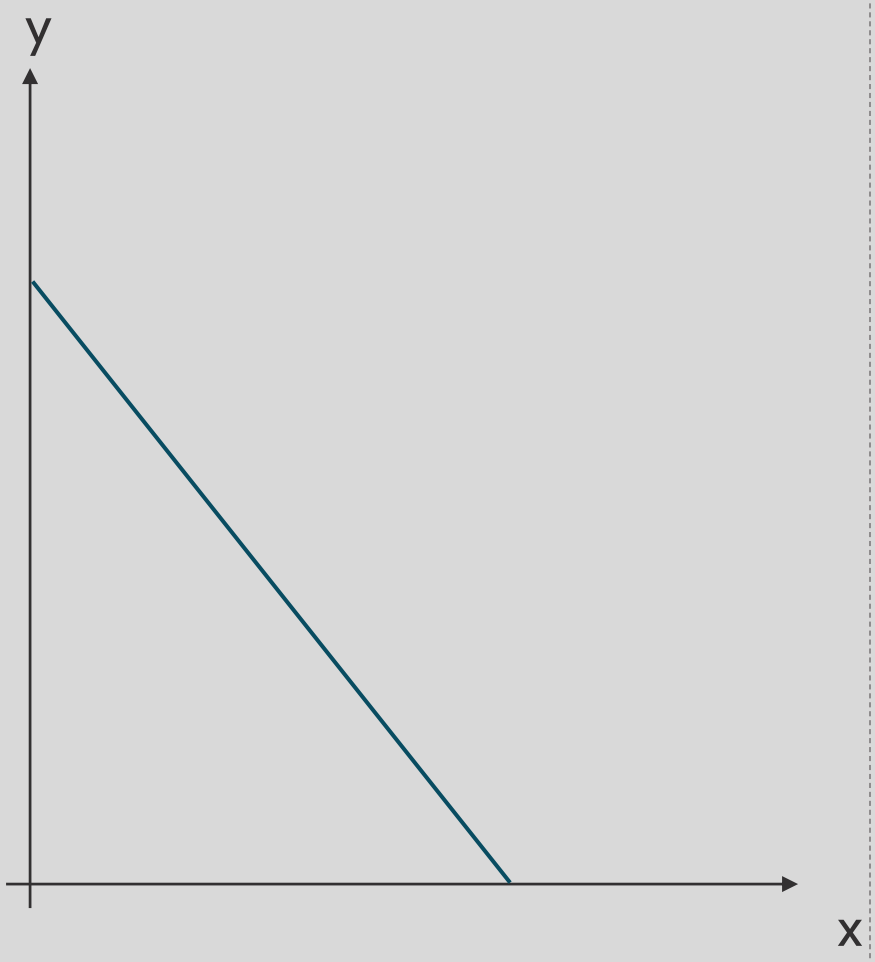
3. Ordinal Approach

3.5 Budget Line

Budget line	Slope of a budget line
	

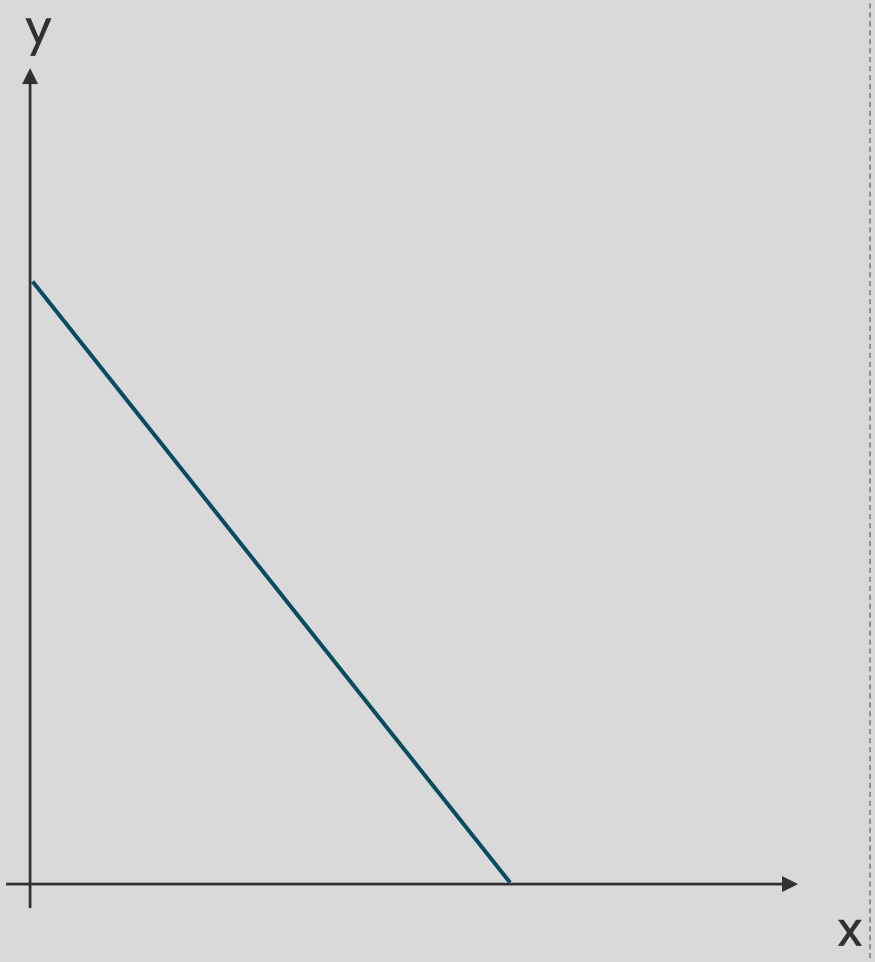
3. Ordinal Approach

3.5 Budget Line

Budget line	When budget constraint shifts
	Supposed that a consumer has a limited budget of 500 baht, each unit of good x is 50 baht and 20 baht for good y. Later the budget is cut to 300 baht.

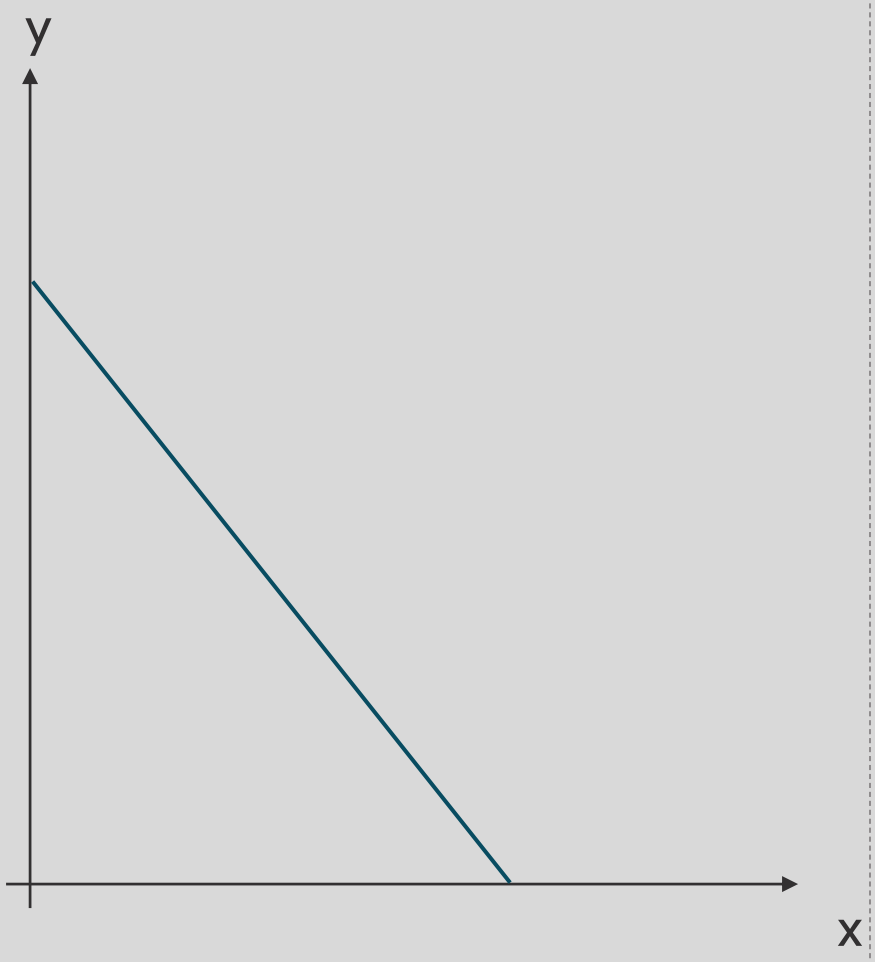
3. Ordinal Approach

3.5 Budget Line

Budget line	When budget constraint tilts
	Supposed that a consumer has a limited budget of 500 baht, each unit of good x is 50 baht and 20 baht for good y. Later, price of good x decreases to 10 baht.

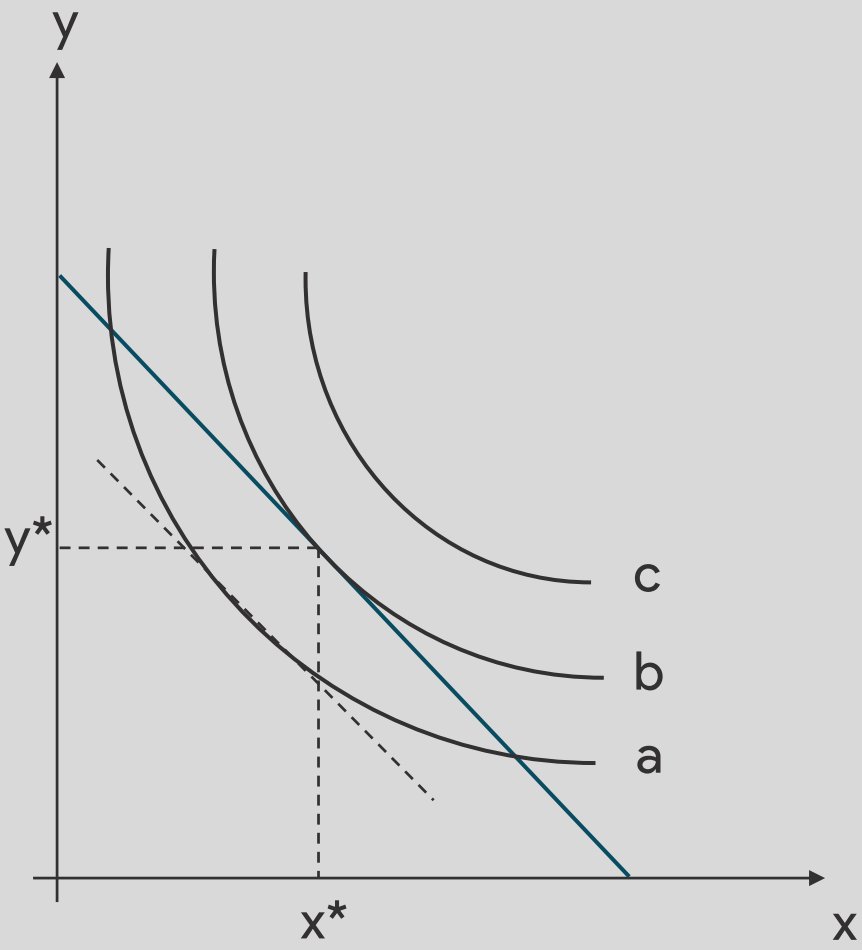
3. Ordinal Approach

3.5 Budget Line

Budget line	When budget constraint tilts
	Supposed that a consumer has a limited budget of 500 baht, each unit of good x is 50 baht and 20 baht for good y. Later, price of good y increase to 100 baht.

3. Ordinal Approach

3.6 Consumer's equilibrium

Equilibrium	Note
	

3. Ordinal Approach

3.6 Consumer's equilibrium

IC slope	Budget line slope
$MRS_{xy} = \frac{\Delta y}{\Delta x} = \frac{MU_x}{MU_y}$	$\frac{P_x}{P_y}$

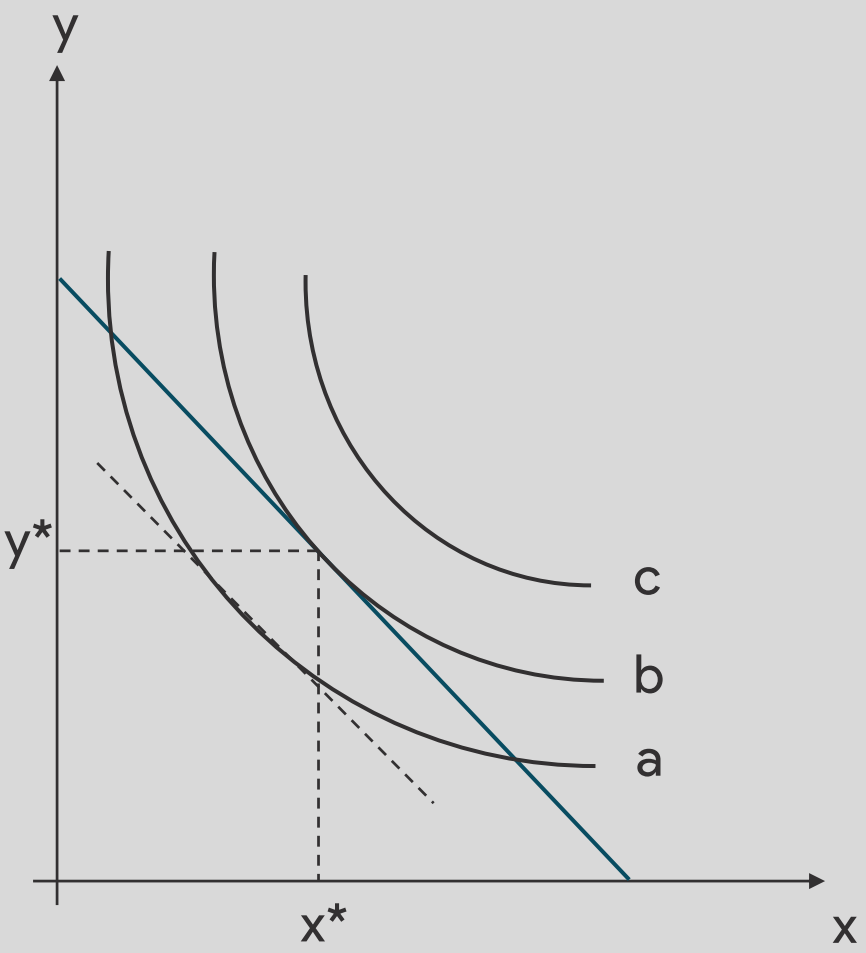
3.9 Definition – Consumer's equilibrium

is the amount of two substitutable goods that maximizes their utility on a budget line.

3. Ordinal Approach

3.6 Consumer's equilibrium

Equilibrium



Example #1

If a consumer is consuming where,

$MRS_{xy} = \frac{1}{5}$

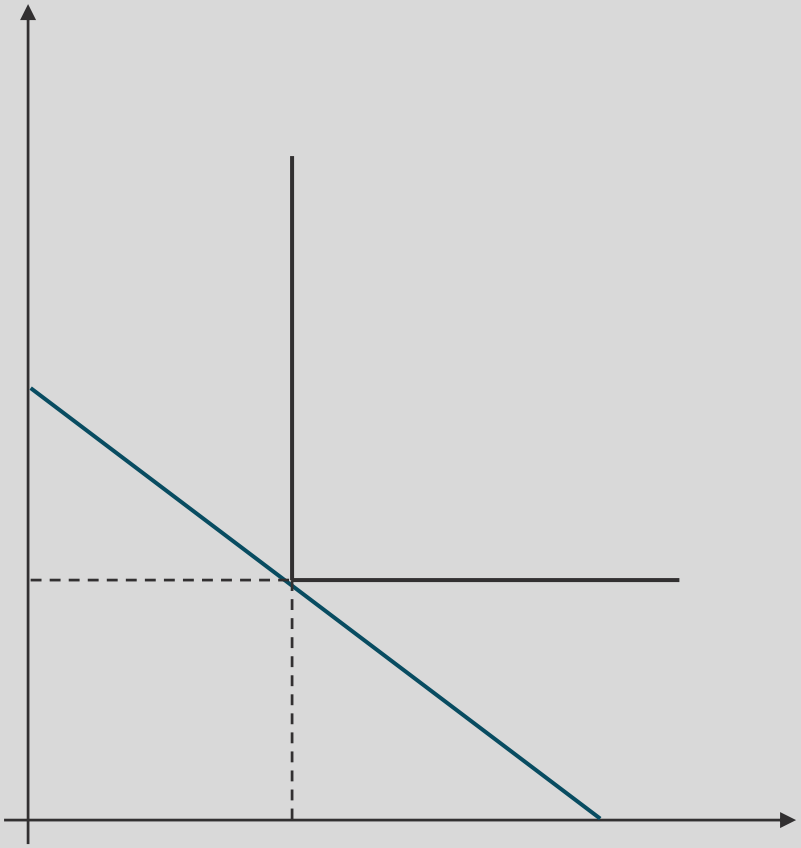
$I = 500\,;P_x = 50\,;P_y = 100$

How does this consumer needs to adjust their consumption to maximize utility.

3. Ordinal Approach

3.6 Consumer's equilibrium

Equilibrium



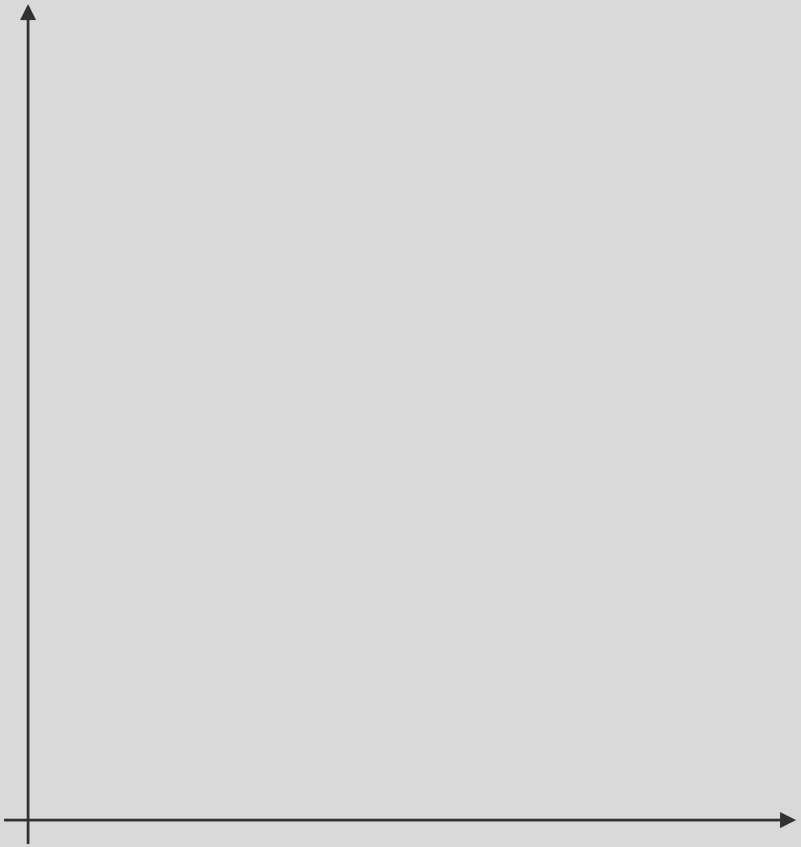
Example #2

Perfectly complementary goods.
If a pan and two spades are used and
$I = 500$; $P_{pan} = 300$; $P_{spade} = 100$

How much each goods does this consumer buy to maximize utility?

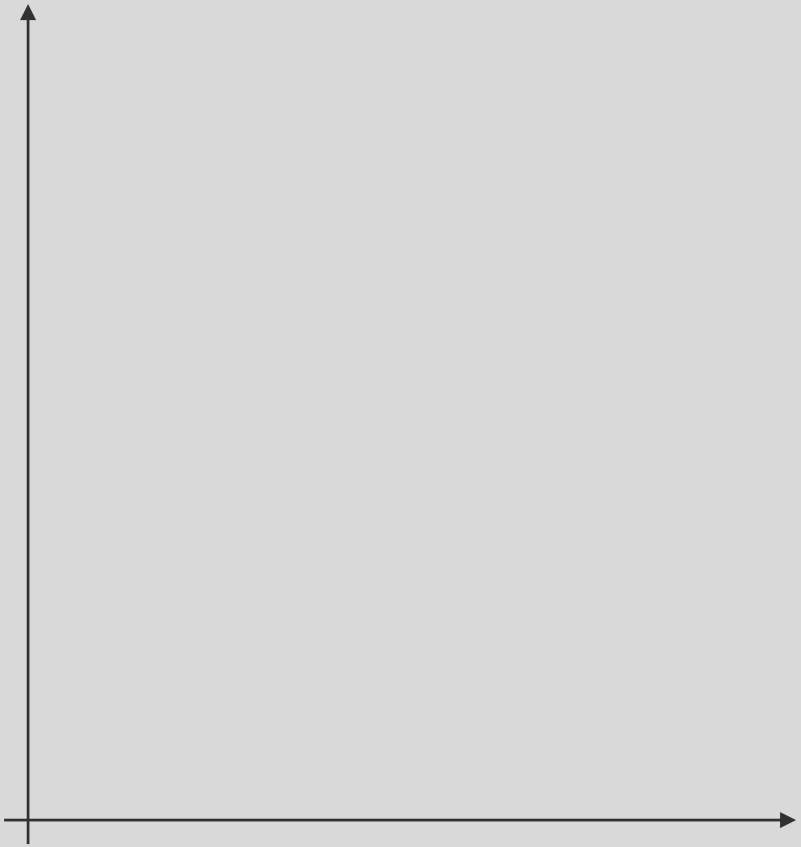
3. Ordinal Approach

3.6 Consumer's equilibrium

Equilibrium	Example #3
	Perfectly substitutable goods. If a consumer has 200-baht budget constraint and he prefers 100-baht note equally to 5 of the 20-baht note.

3. Ordinal Approach

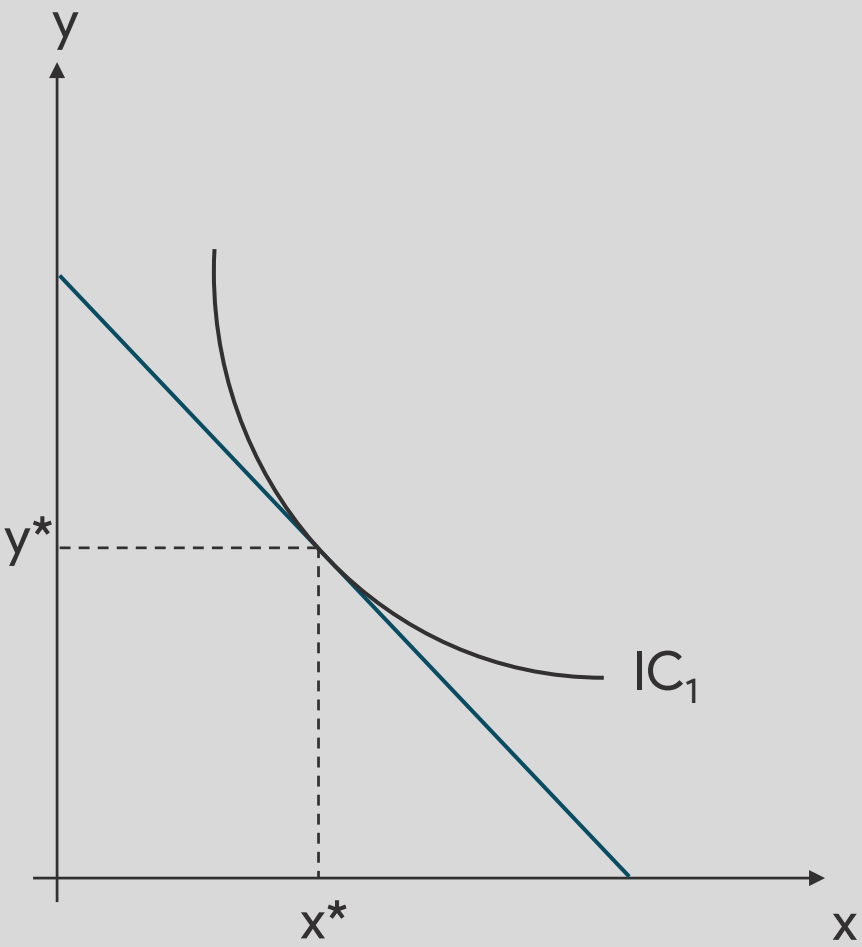
3.6 Consumer's equilibrium

Equilibrium	Example #3
	Perfectly substitutable goods. If a consumer has 200-baht budget constraint but he prefers 100-baht note equally to 6 of the 20-baht note. (Since he does not want to carry lots of bank note.)

3. Ordinal Approach

3.7 Changes in equilibrium

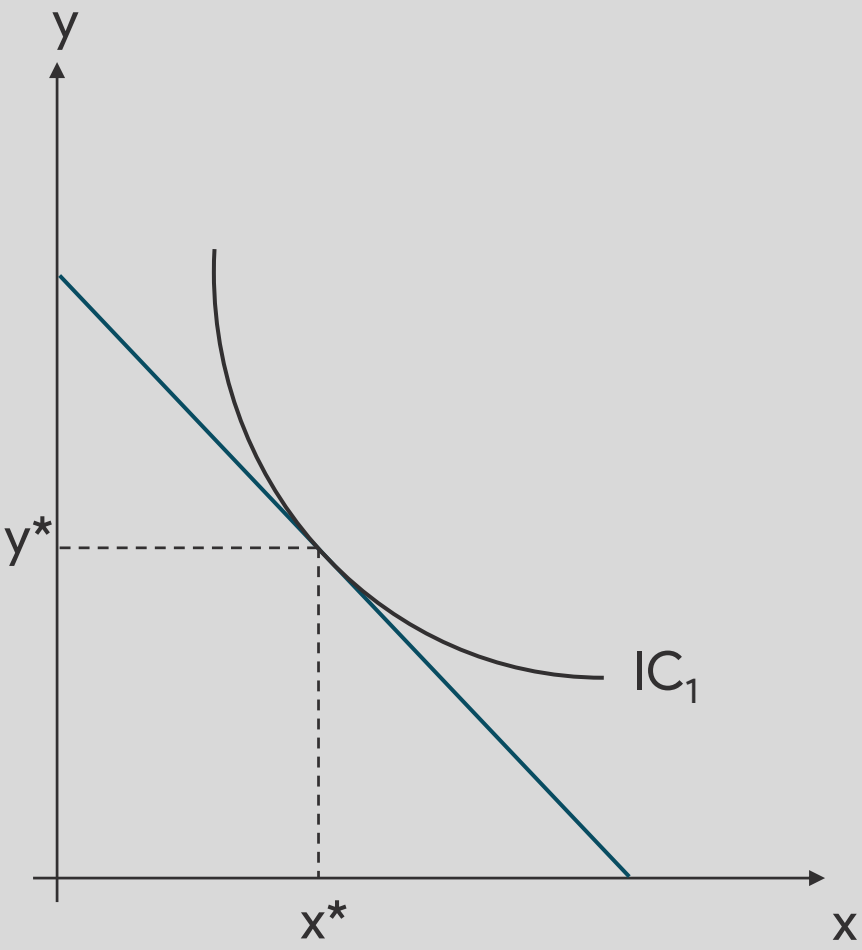
Equilibrium	When a consumer has more budget



3. Ordinal Approach

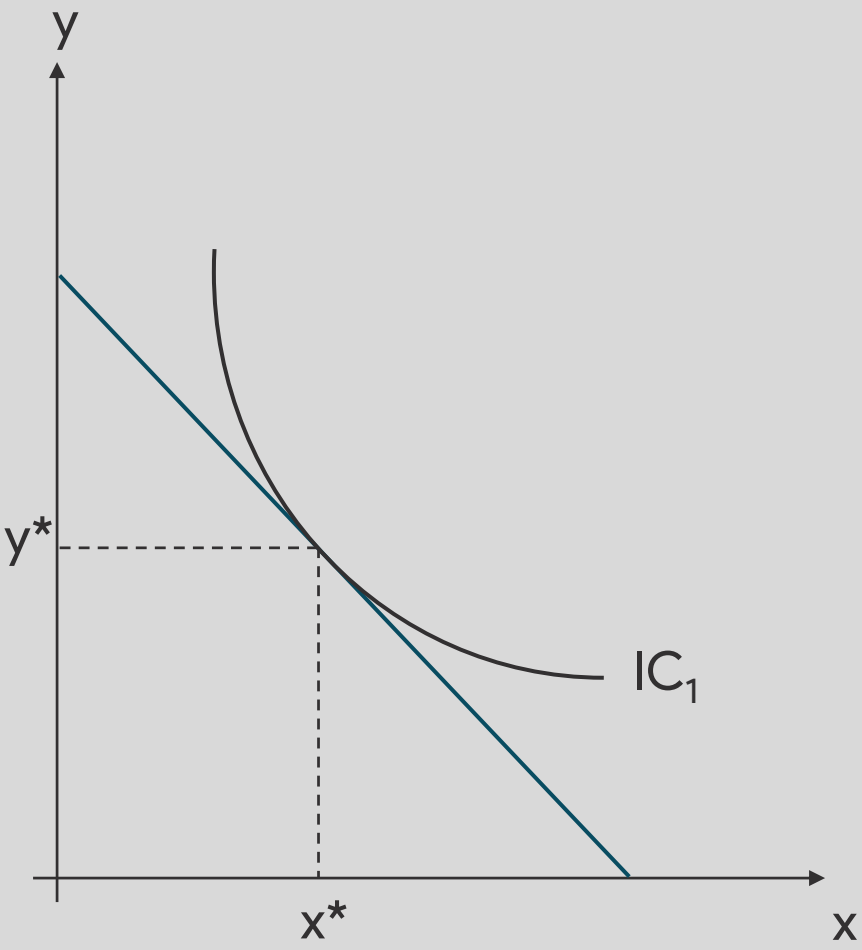
3.7 Changes in equilibrium

Equilibrium	When a consumer has less budget



3. Ordinal Approach

3.7 Changes in equilibrium

Equilibrium	When price of y increases
	

3. Ordinal Approach

3.7 Changes in equilibrium

3.10 Definition – Hicksian Price Effect

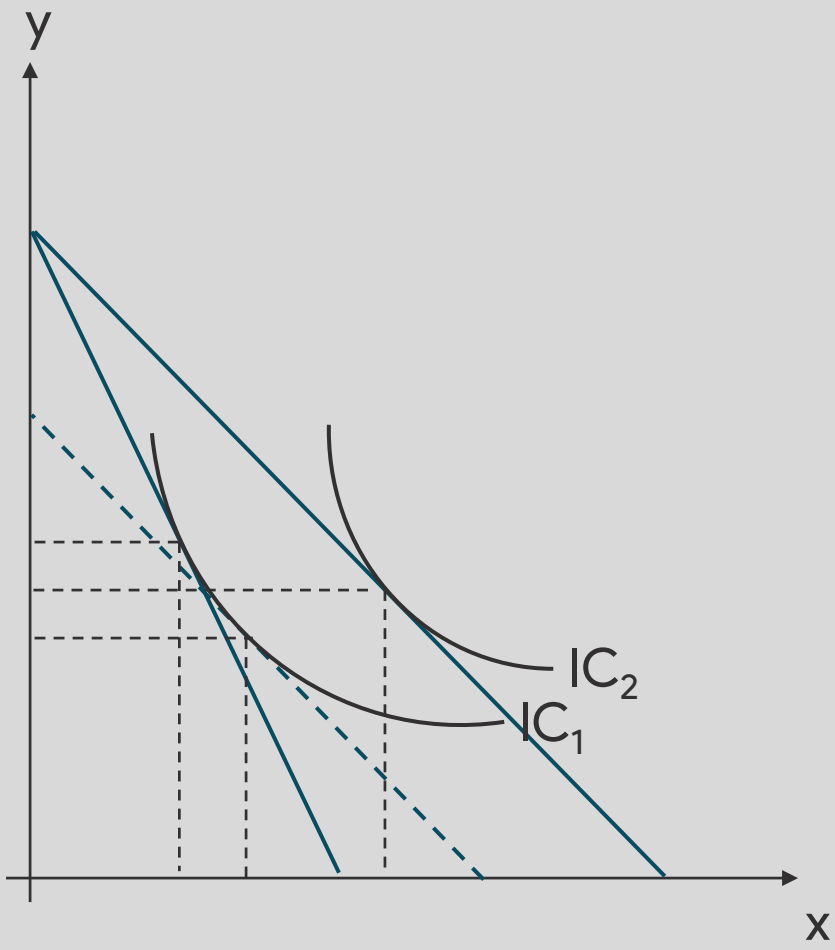
is a change in quantity when price changes.

- **Substitution effect**: when price of a good decreases (increases), another substituting good is relatively more expensive (cheaper).
- **Income effect:** when price of a good decreases (increases), consumer is better off (worse off) because his real income increases (decreases.)

3. Ordinal Approach

3.7 Changes in equilibrium

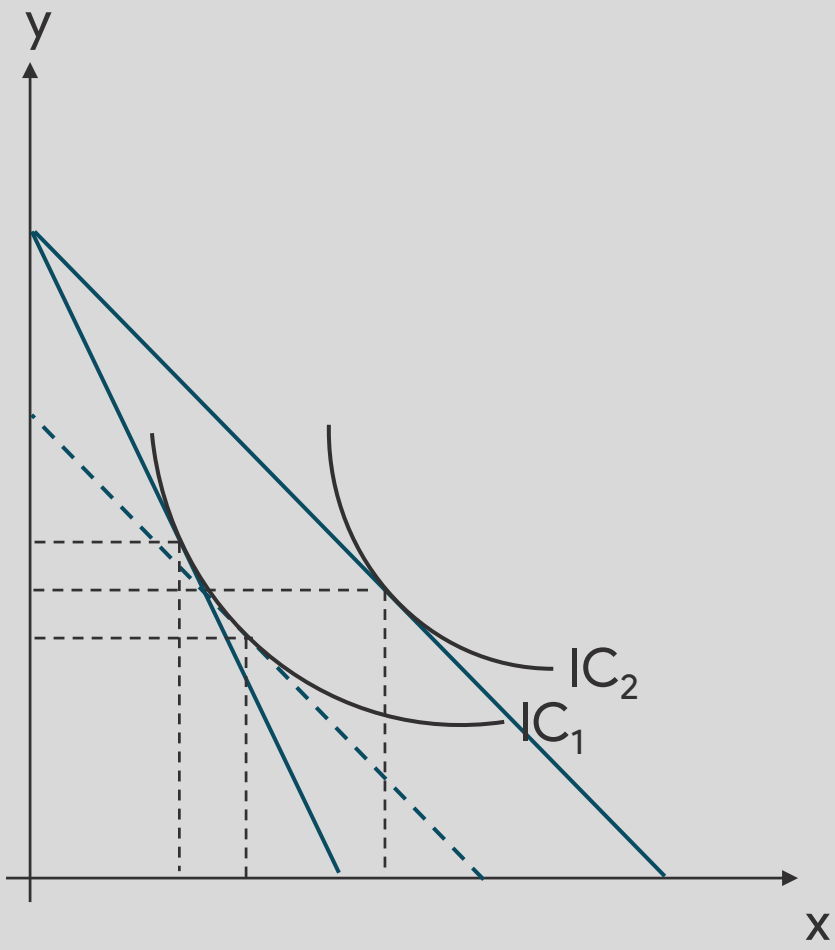
Case 1A: normal good	When price of x decreases



3. Ordinal Approach

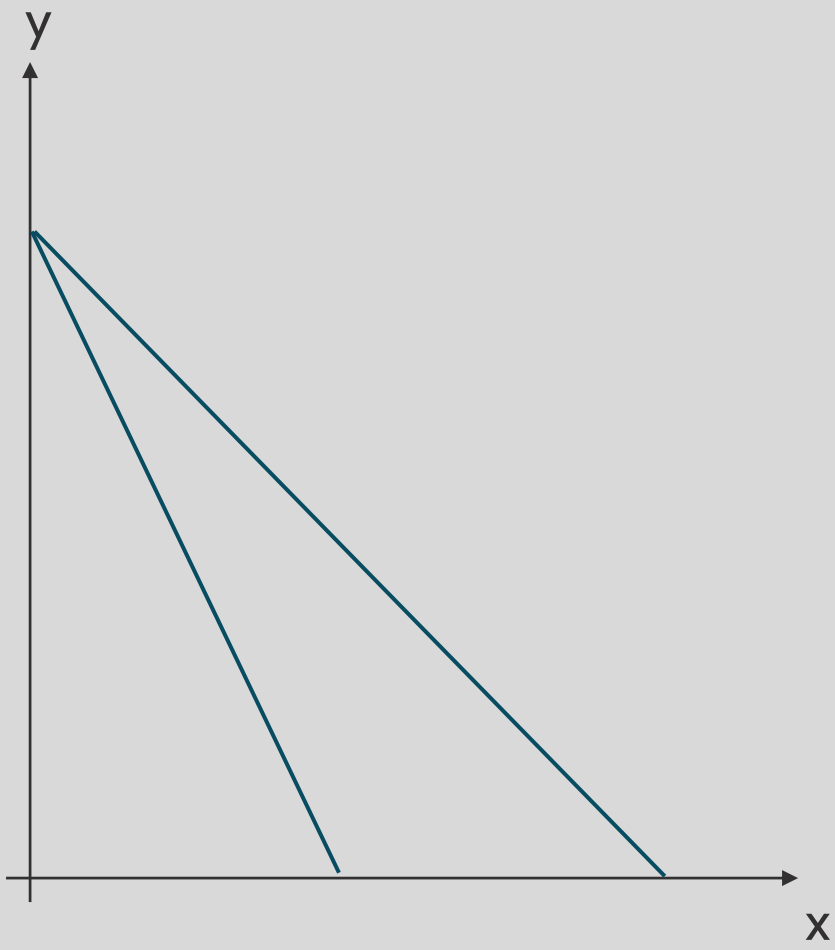
3.7 Changes in equilibrium

Case 1A: normal good	When price of x decreases



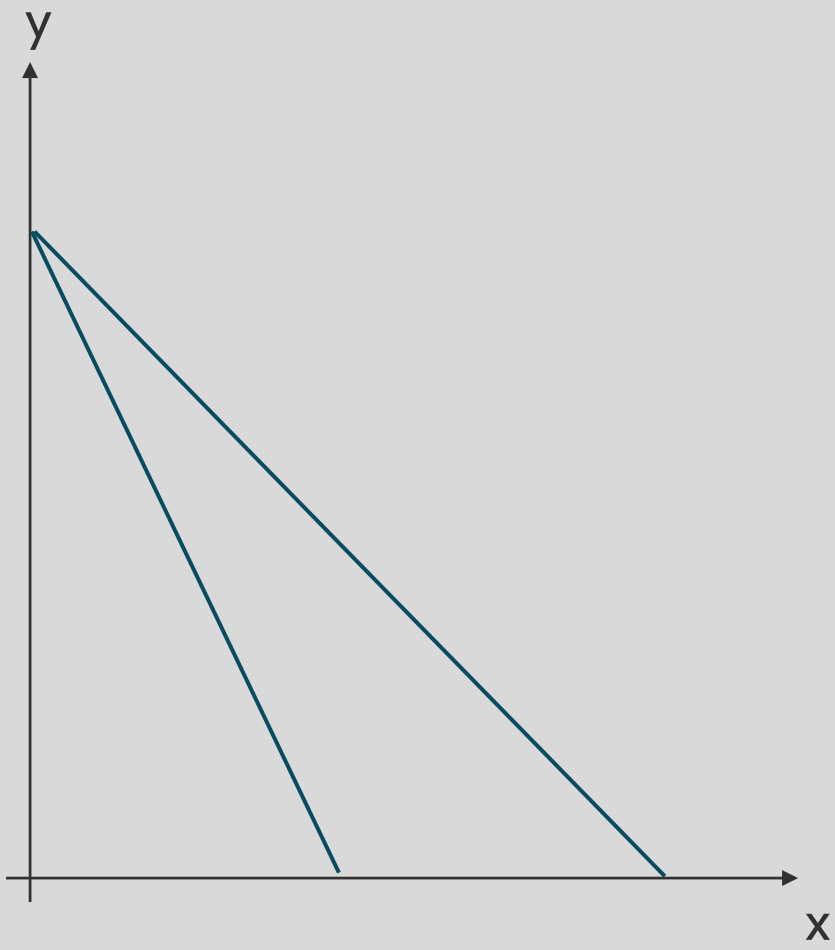
3. Ordinal Approach

3.7 Changes in equilibrium

Case 1B: normal good	When price of x increases
	

3. Ordinal Approach

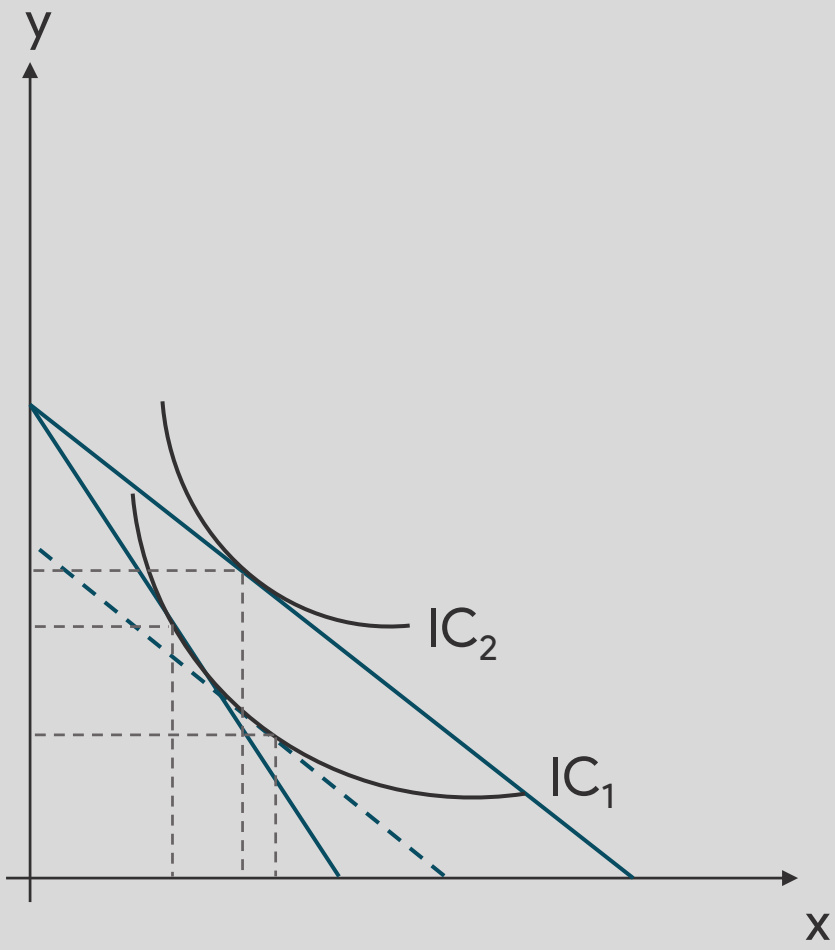
3.7 Changes in equilibrium

Case 1B: normal good	When price of x increases
	

3. Ordinal Approach

3.7 Changes in equilibrium

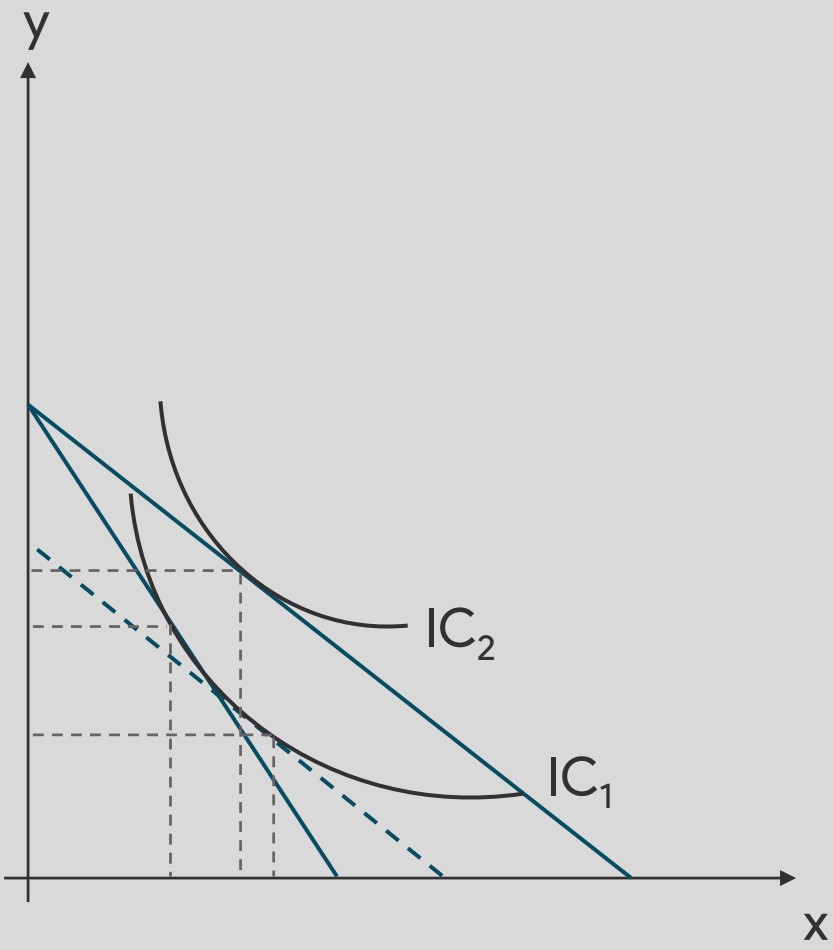
Case 2: inferior good	When price of x decreases



3. Ordinal Approach

3.7 Changes in equilibrium

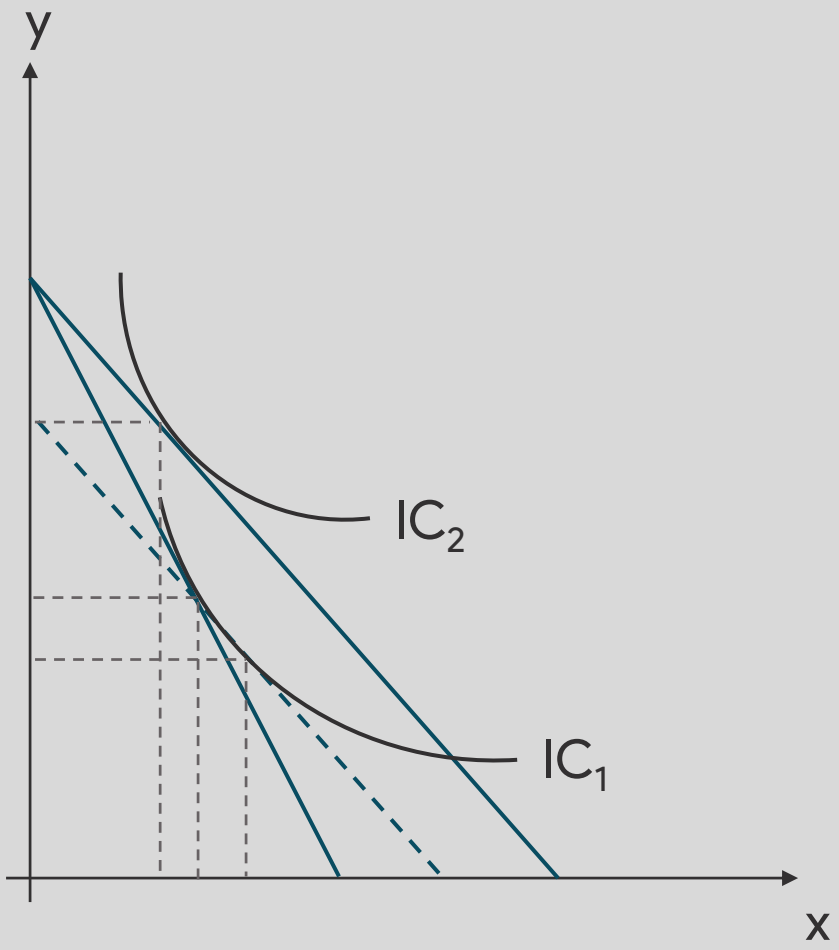
Case 2: inferior good	When price of x decreases



3. Ordinal Approach

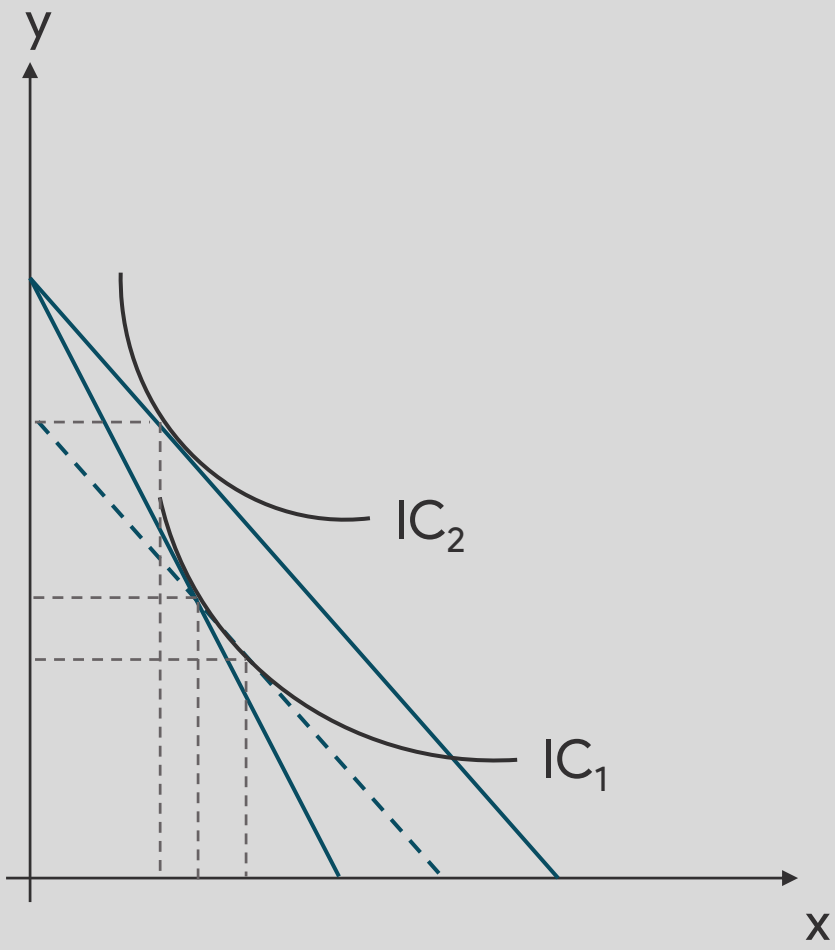
3.7 Changes in equilibrium

Case 3: Giffen good	When price of x decreases



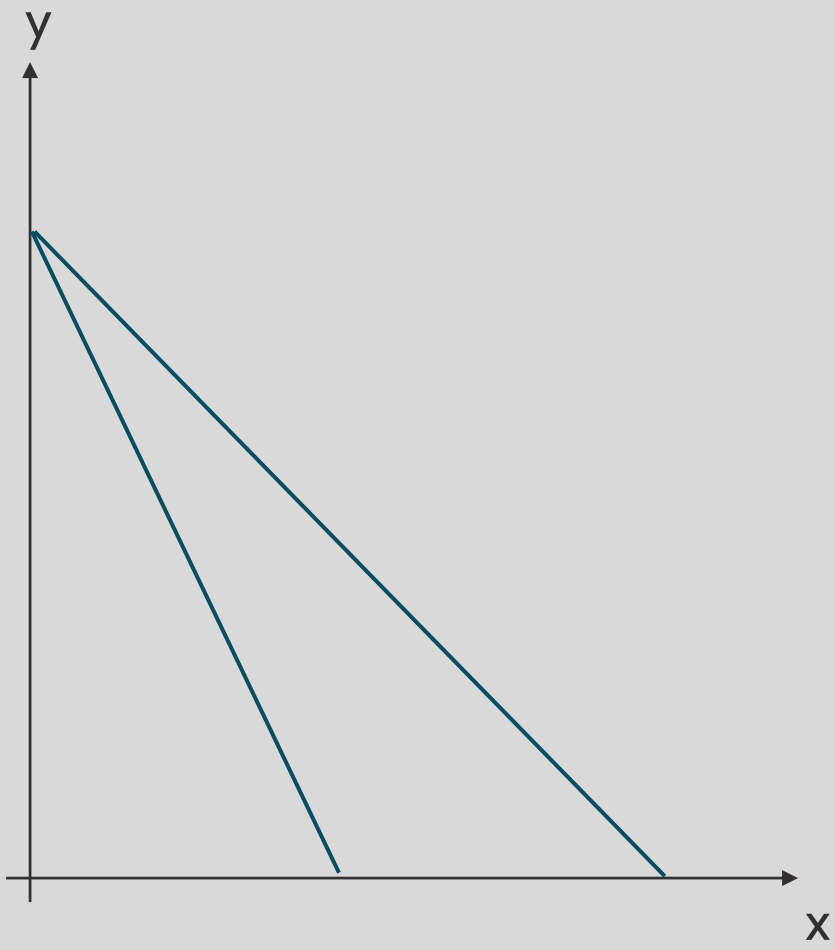
3. Ordinal Approach

3.7 Changes in equilibrium

Case 3: Giffen good	When price of x decreases
	

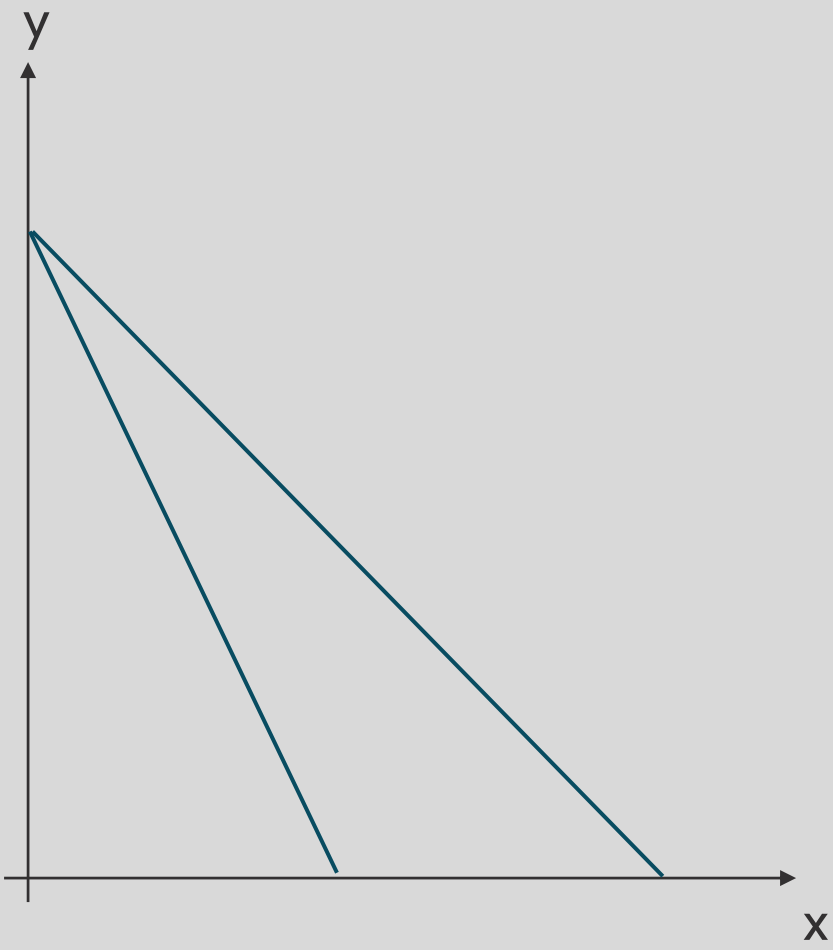
3. Ordinal Approach

3.7 Changes in equilibrium

Case 4: Perfectly complementary	When price of x decreases
	

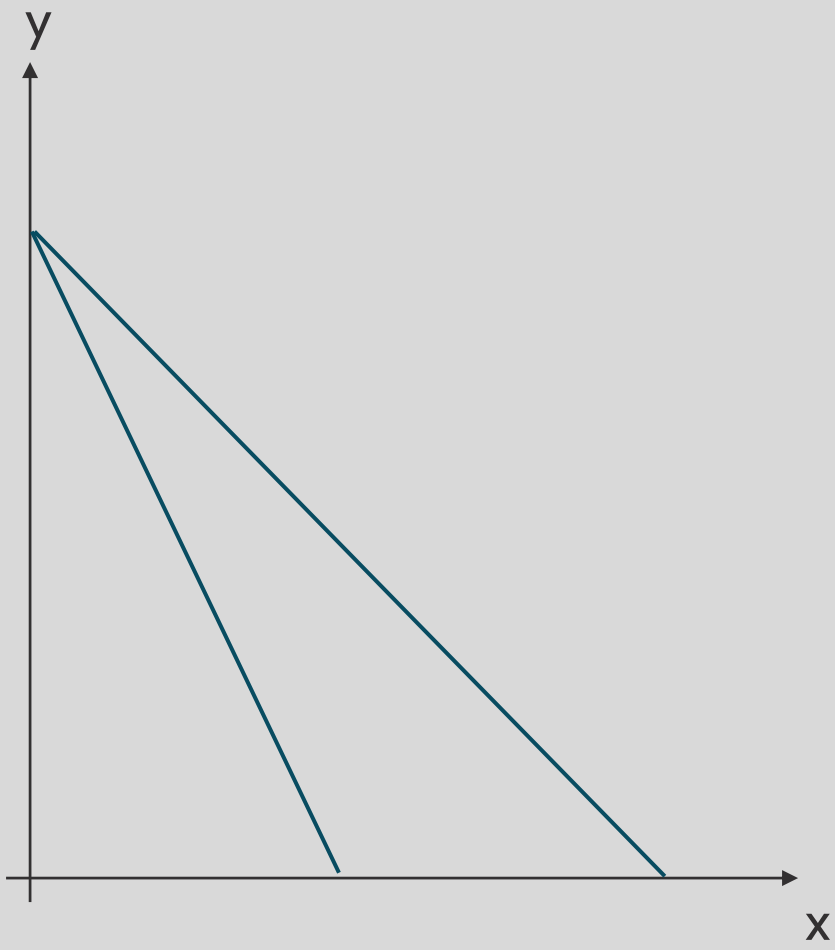
3. Ordinal Approach

3.7 Changes in equilibrium

Case 4: Perfectly complementary	When price of x decreases
	

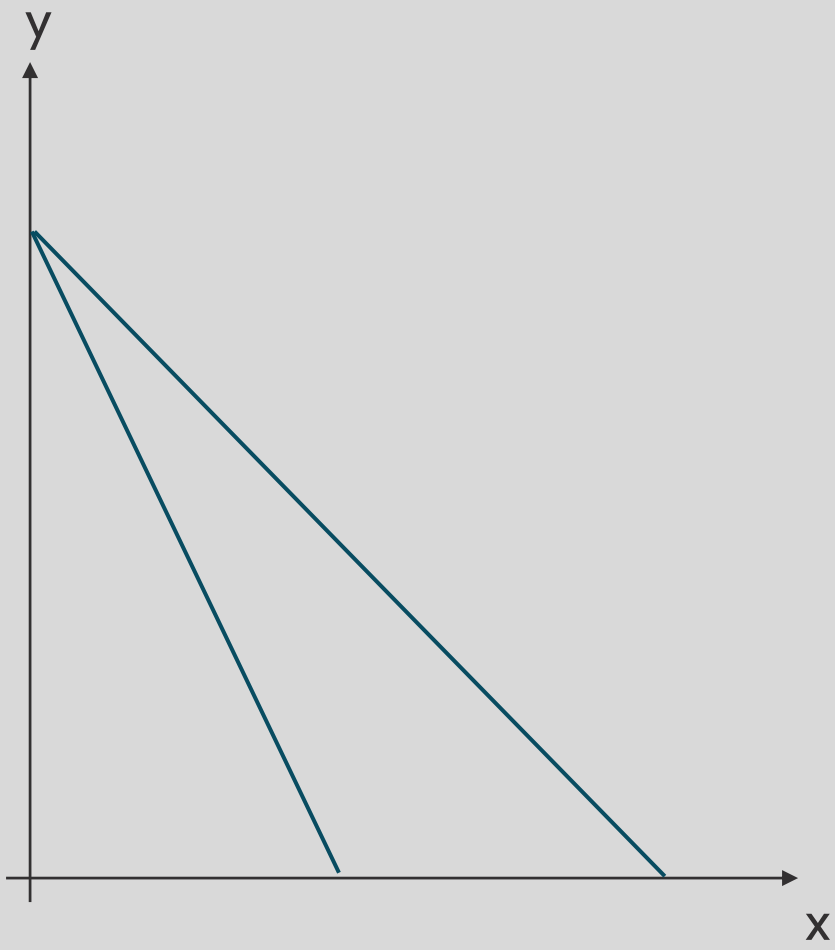
3. Ordinal Approach

3.7 Changes in equilibrium

Case 5: Perfectly substitutable	When price of x decreases
	

3. Ordinal Approach

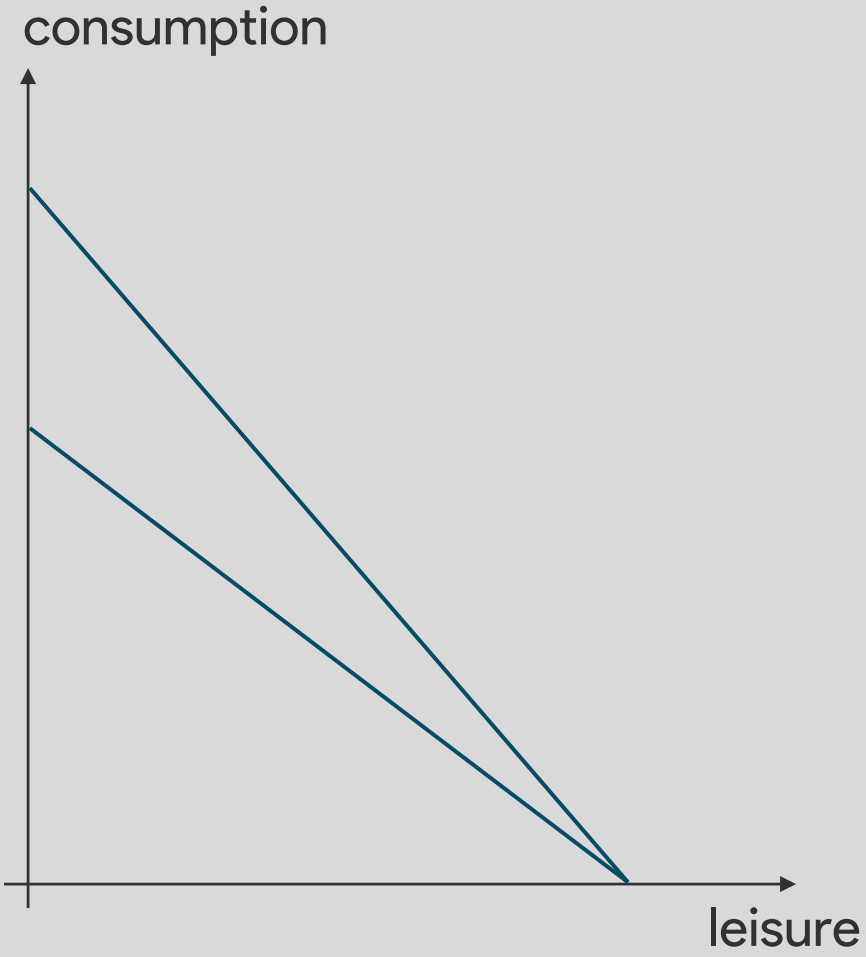
3.7 Changes in equilibrium

Case 5: Perfectly substitutable	When price of x decreases
	

3. Ordinal Approach

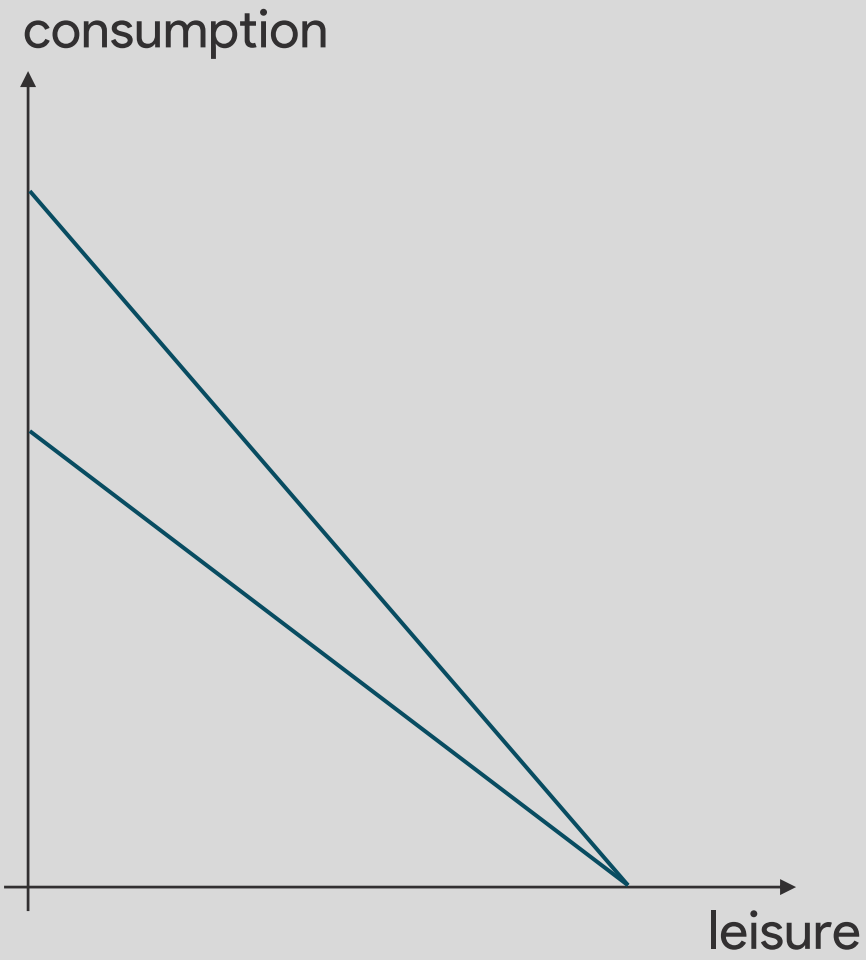
3.7 Changes in equilibrium

Case 6A: Labor supply	When wage increases



3. Ordinal Approach

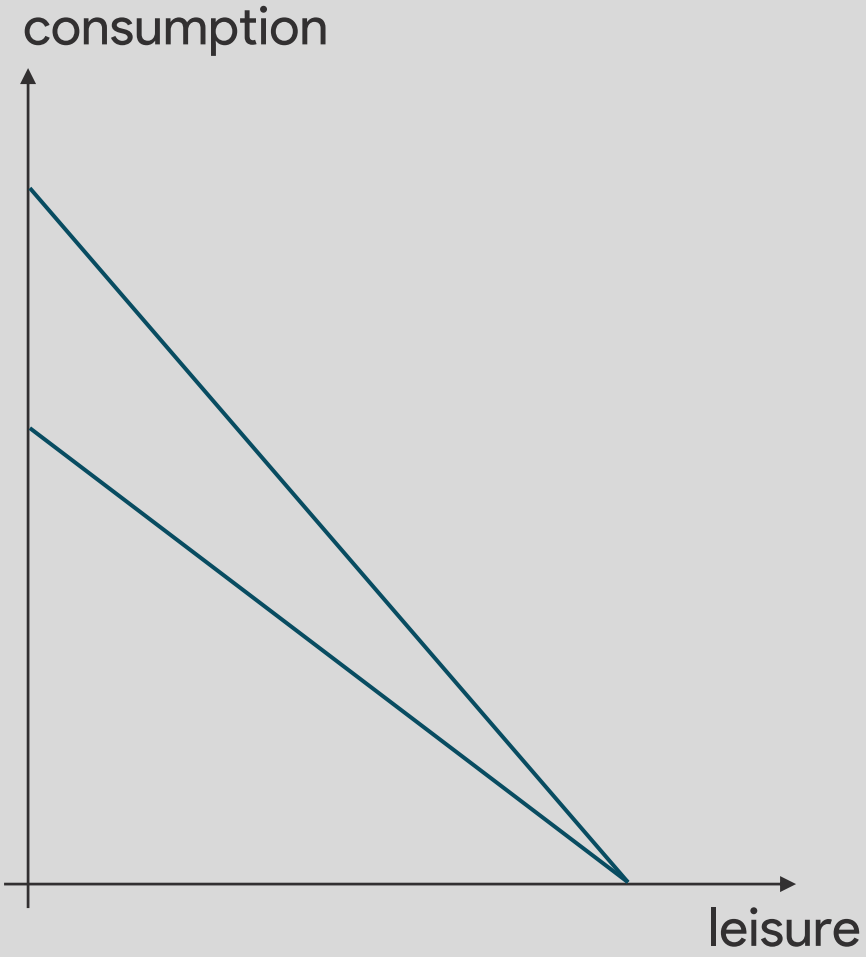
3.7 Changes in equilibrium

Case 6A: Labor supply	When wage increases
	

3. Ordinal Approach

3.7 Changes in equilibrium

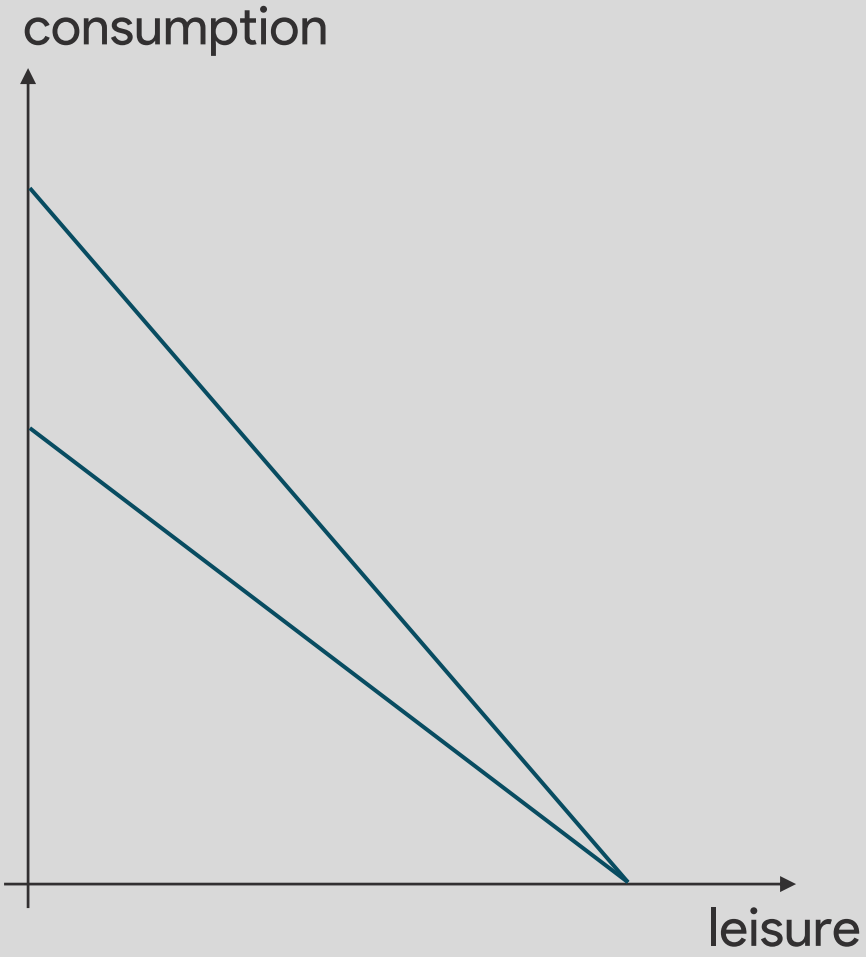
Case 6B: Backward-bending labor	When wage increases



3. Ordinal Approach

3.7 Changes in equilibrium

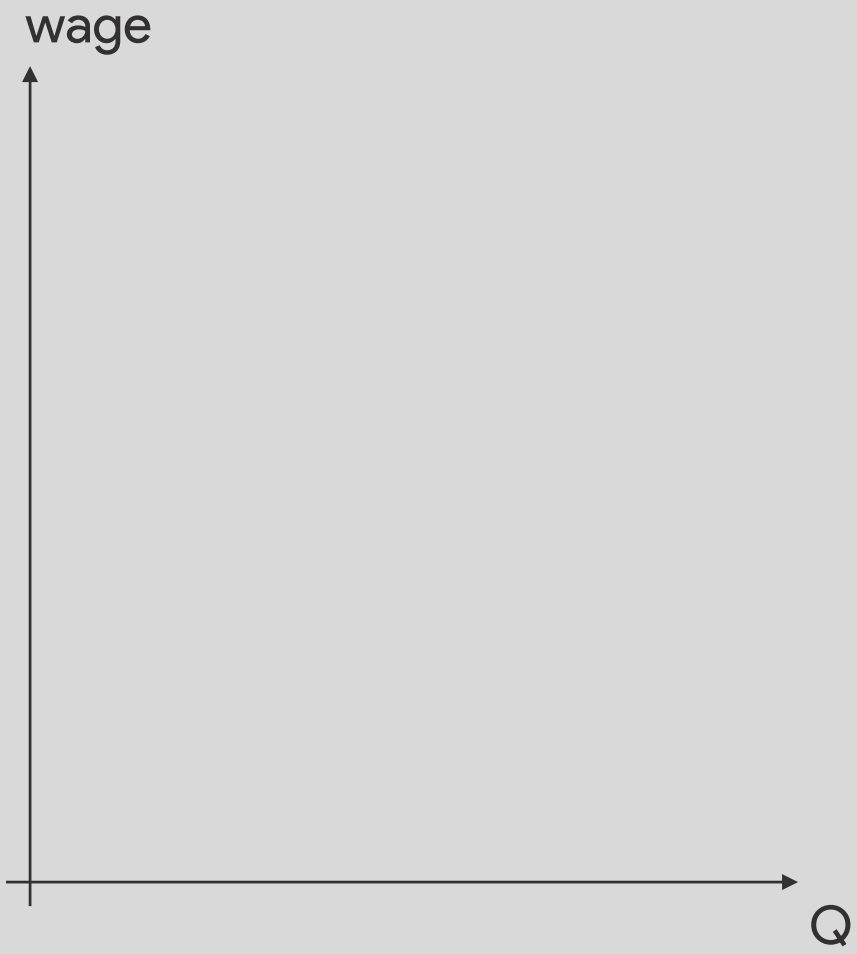
Case 6B: Backward-bending labor	When wage increases



3. Ordinal Approach

3.7 Changes in equilibrium

Labor supply summary



4. Demand Curve from Consumer Behavior

4.1 Definition

3.11 **Definition – Price-Consumption Curve (PCC)**

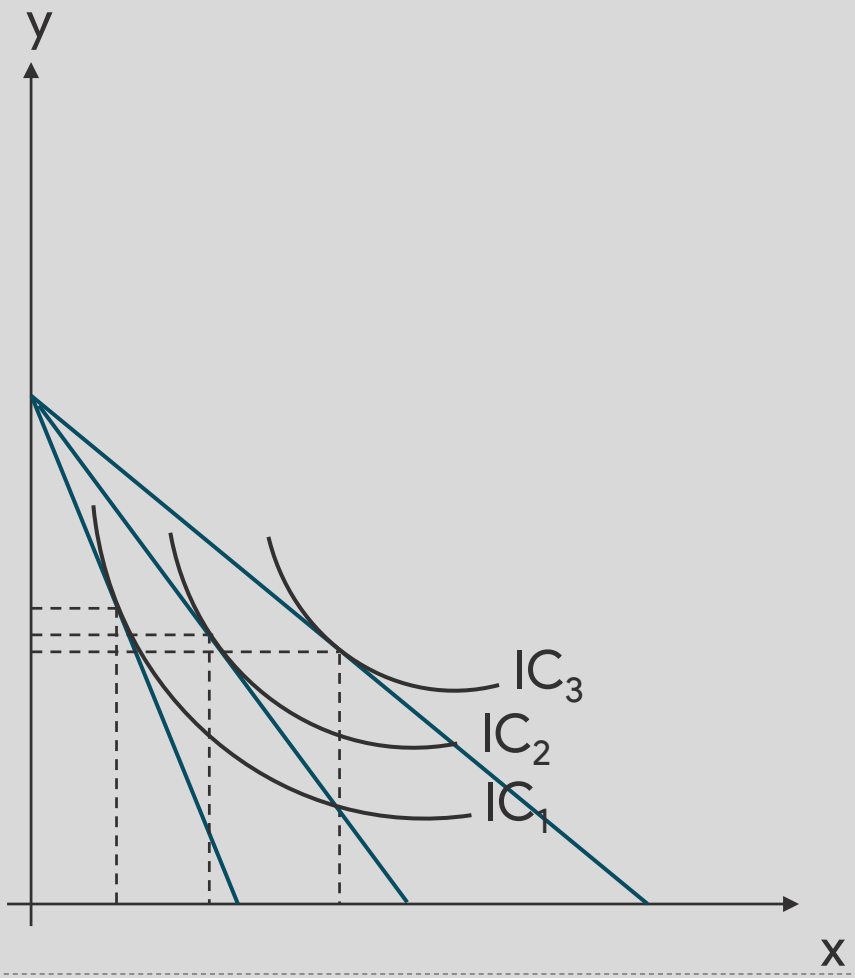
is a curve that connects each consumer's equilibrium point when price changes.

3.12 **Definition – Income-Consumption Curve (ICC)**

is a curve that connects each consumer's equilibrium point when income changes

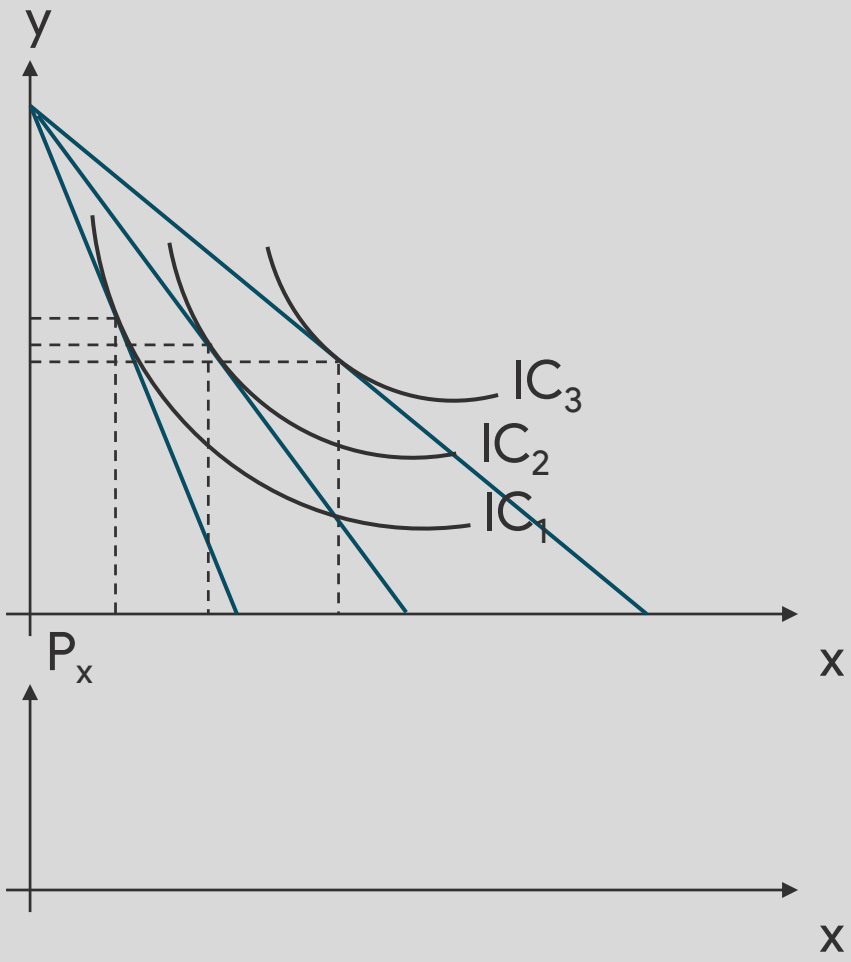
4. Demand Curve from Consumer Behavior

4.2 Price-Consumption Curve

PCC	Note
	

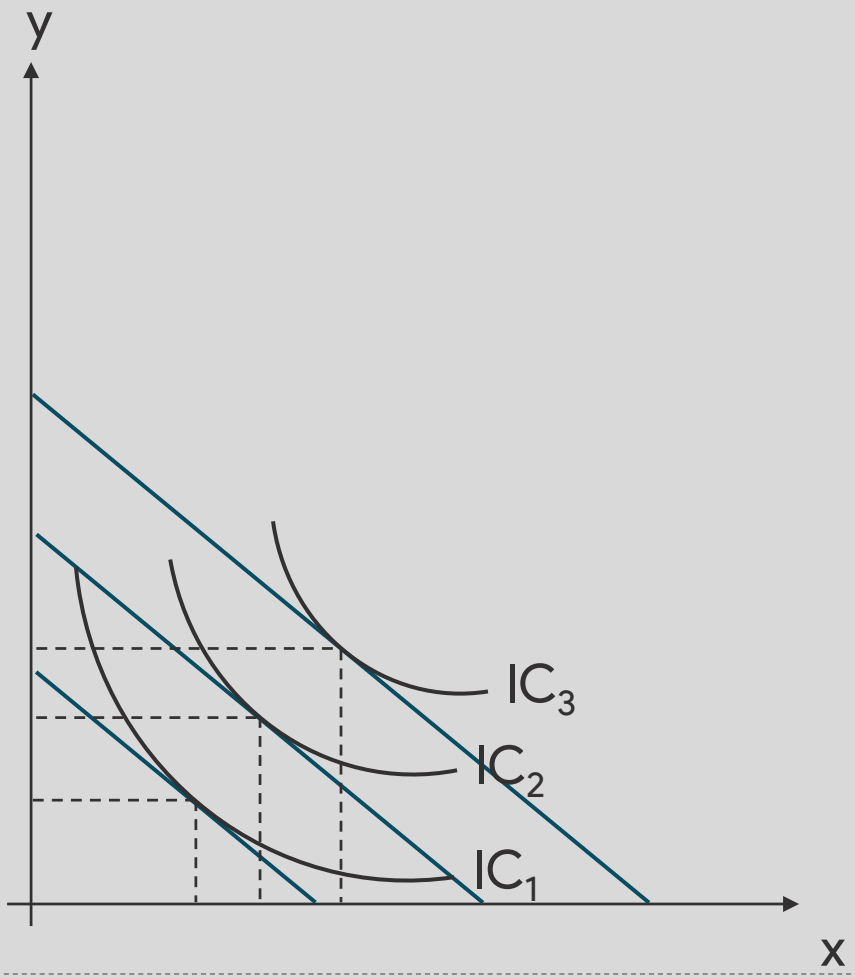
4. Demand Curve from Consumer Behavior

4.2 Price-Consumption Curve

PCC	Note
	

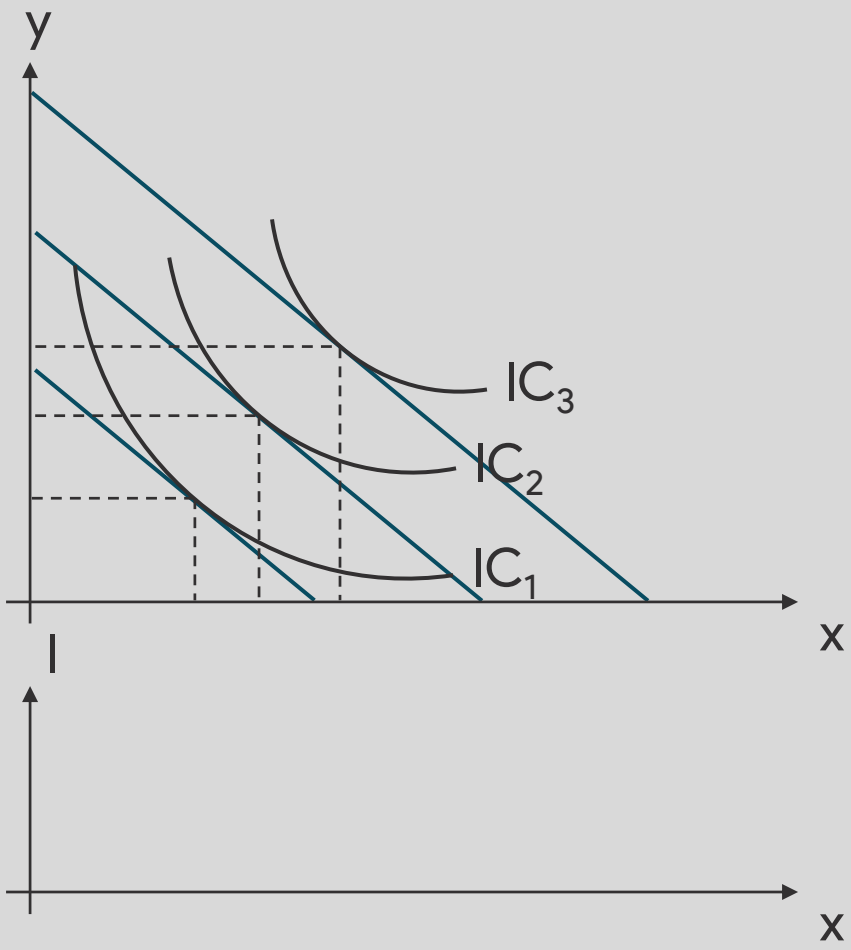
4. Demand Curve from Consumer Behavior

4.3 Income-Consumption Curve

ICC	Note
	

4. Demand Curve from Consumer Behavior

4.3 Income-Consumption Curve

ICC	Note
	

4. Demand Curve from Consumer Behavior

4.4 Summary

3.2 Proposition – Consumer and demand curve

- The ordinal approach mainly focuses on two substitutable goods. Indifferent curve and budget line is the tools for this approach.
- With the assumption of rational decision making and non-satiation, the equilibrium is on the budget line when the slope of IC and budget line is equal, for normal substitutable goods.
- When price changes, we can study substitution effect and income effect.
- New equilibrium shows the relationship between price and quantity change, which can be used to construct an individual demand curve.