Chapter 3

Limits and continuity of a function

1 Reasoning

Reasoning means claiming that if there are reasons p1, p2, p3,...pn, then it canReasoning consists of two important parts:

1) Hypotheses are the parts that are "causes" or things that are given to be represented by subordinate propositions.P,Py Py-9.P.

2) Conclusion (Conclusion) is a conclusion from a hypothesis or reason. or the "result" part is represented by C

1 Reasoning

The reasoning check is as follows.

1) If the form of the proposition (P, ^ P, ^ p,...^ P.) -7 C is an eternal truth, then this reasoningReasonable (Valid)

2) If the form of the proposition (P, ^ p., ^p ... p) -/ c is not eternally true, then this reasoningNot reasonable (Invalid)

1 Reasoning

From reasoning arranged in the form of propositions If...then...is cause -> effect then do Check to see if it is an eternal truth or not. Can be done as follows

1) By creating a truth table.
2) By analyzing the truth value

Reasonable reasoning formats that you should know are as follows:

รูปแบบที่ 1	รูปแบบที่ 2
เหตุ 1) $p \rightarrow q$	เหตุ 1) $p \rightarrow q$
2) p	2) $\sim q$
ผล q	ผล $\sim p$

Reasonable reasoning formats that you should know are as follows:

รูปแบบที่ 3	รูปแบบที่ 4
เหตุ 1) $p \rightarrow q$ 2) $q \rightarrow r$ ผล $p \rightarrow r$	เหตุ 1) $p \vee q$ 2) $\sim p$ ผล q
รูปแบบที่ 5	**รูปแบบที่ 6**
เหตุ $p \wedge q$ ผล p (หรือ q)	เหตุ p ผล $p \vee q$

Reasonable reasoning formats that you should know are as follows:

รูปแบบที่ 7	รูปแบบที่ 8
เหตุ $p \rightarrow q$	เหตุ 1) $p \rightarrow r$
ผล $\sim q \rightarrow \sim p$	2) $q \rightarrow s$
(หรือ $p \vee q$)	3) $p \vee q$
	ผล $r \vee s$

2 Opening sentence

An opening sentence is a declarative or negative sentence. that consists of variables making it not a propositionAnd when the variables are replaced with members of the relative universe, the proposition will be obtained.

x + 3 > 7 ; ประโยคเปิดที่มีตัวแปร “x”

x - y = 10 ; ประโยคเปิดที่มีตัวแปร “x และ y”

เขาเป็นนักฟุตบอลทีมชาติไทย ; ประโยคเปิดที่มีตัวแปร “เขา”

เธอเป็นนักศึกษาระดับ ปวส. ; ประโยคเปิดที่มีตัวแปร “เธอ”

ประโยคข้างต้นไม่เป็นประพจน์ เพราะเราไม่ทราบค่าของตัวแปรในแต่ละประโยคนั้นคืออะไร และไม่สามารถหาค่าความจริงได้

Making an opening sentence into a proposition

1) Bring members in the relative universe. Substitute variables in the opening sentence.When substituting variable values in an opening sentence will reveal the truth value of that sentence, such as the opening sentence $x + 3 > 4$ and $U = \{0, 1, 2\}$

If you replace x with 0, you will get $0 + 3 > 4$ with a truth value of false.

If you replace x with 1, you will get $1 + 3 > 4$ with a truth value of false.

If you replace x with 2, you get $2 + 3 > 4$, with the truth value being true.

การทำประโยคเปิดให้เป็นประพจน์

2) Fill in the quantity indicators for every variable, such as every value of x that is a real number x2 -1 ≥ 0.

Therefore, an opening sentence that can be made into a proposition must contain an opening sentence, a relative universe. and quantity indicators

3 Quantity indicator

All quantity indicators (Universal Quantifer) include quantity indicators that have the same meaning as"for...everybody" or "every" etc., which means everything in the relative universe (U) must be used andUse the symbol (pronounced for al! represents all quantity indicatorsWe use the symbol 6x instead for every x or for each x.And if P(x) is used to represent the opening sentence, it is written as 6x [P(x)] instead for every x in PCx).For example, for every x such that x + 0 = x when the relative universe is a real number.Represented by Yx(x + 0 = XJ, U = R if given PX) instead of x + 0 = xWe get YxIP(x)], U = R.

3 Quantity indicator

2 There must be at least one Existential Quantifer, i.e. a meaningful quantitative indicator.Same as "for some..." or "some" or "there is at least one", which means at least one member.In the relative universe And use the symbol 3 (pronounced for some) to represent at least one quantity indicator.We use the symbol 3x instead for some x.And if P(X) is used instead of the opening sentence, it is written as 3xIP(x) instead for some x in PX.For example, for every x such that x + 2 = 0 when the relative universe is an integer.Written instead as 3x(x + 2 = 0], U = / if given PX) instead of x + 2 = 0will get 3x(P(x)], U = 1

4 The truth value of the propositions that aresingle variable quantity indicator

1.Truth value of the proposition (x[P(x)]x[P(x)] has the truth value true.Only if, by substituting every value of x in U, P(X) is true.x[P(x) has a truth value of false.Only if substituting at least one x value in U makes P(x) false.

4 The truth value of the propositions that aresingle variable quantity indicator

2.The truth value of the proposition x[P(x)]3x[P(x)] will have the truth value true.Only when substituting at least one x value in U makes P(x) true.3x[P(x)] will have a true value of false.Only if, by substituting every value of x in U, it makes P(X) all false.(No single member of U substitutes for x in P(X) and makes P(xX) true.)

summarize

Reasoning is considering that if there is a cause P, I P, I P ... .P then the result C that occurs isIs it reasonable? This can be done by checking whether it is an eternal truth or not.An opening sentence is a declarative or negative sentence that has a variable.Quantity indicators are divided into 2 types: total quantity indicators and the quantity indicator has at least oneThe truth value of the proposition6xIP(x)] is true if every x value in U is substituted in P(X), then P(X) is true.x IP(x)] is false if at least one x value in U is substituted in PX) then P(X is false.3x(P(X) is true if at least 1 value of x in B is substituted in PX) then P9) is true.3x [P(x)] is false if every x value in U is substituted in P(X), then P(X) is all false.