Grading Criteria (Assignment 1)

Q1

If Right **Then** 1

Else 0

Q2

Score=15

When score>0 **:**

If One mistake **Then** Score – 1

Q3

No name of law: (a)-1 (b)-1 (c)-2

Each mistake -1

For some cases, the score is at the assistant's discretion.

Q4

(a)(b)process(1p) answer(1p)

(c)(d)process(2p) answer(1p)

Q5

explaination integrality(3p)

conclusion integrality(2p)

Discretionary marking without both of above

Only the answer without the explaination give 1 point

Q6, Q7

1. The process is basically correct (there are no critical problems affecting the derivation, but there are a few details such as skipping steps), give 5 points

2. The process is basically correct, there are a lot of jumping、important jumping、logic confusion、did not write any rules used give 4 points.

3. The deducing error in the process is scored 0 points for the benchmark. On the basis of following the slides proof format, 0.5 points are given for each occurrence where the correct conclusion is derived from the known conditions of the question and the inference rule is used correctly, and the score in this method does not exceed 2 points.

Q8

For each sub-question 1 point, the correct answer (the meaning can be in line with the question) will be given full marks, and the wrong answer will not be scored.

Special Notes for Q6-Q8:
1. The proof process is written in an orderly manner, do not write horizontally for a while, write vertically for a while, write obliquelyfor a while;
2. Many students did not refer to the proof examples given on the slides, the proof process is a bit rough, it is recommended to look at the slides again or look at the standard answer.
3. A very small number of students have a lot of jumps, it is difficult to understand what is being said, it is also recommended to look at the courseware again or look at the standard answer.

Q9-10

This section has a total of 13 points

T9 (8 points)

If the answer is marked as' answer ', full marks will be given; The answer format is not unique; The order can be reversed

The answer is not a standard answer, as long as the meaning corresponds, it will be given as full
Special instructions:
If the exact condition is not considered, 3 points will be deducted; Exactly conditional consideration error -2; If then written as equivalent, one point will be deducted; X= Deduct one point if y is not written; The format is not standardized -1; Completely Wrong Direction -5

T10 (5 points)

If the answer is marked as' answer ', full marks will be given; The answer format is not unique; The order can be reversed

The answer is not a standard answer. If there is a process, points can be given according to the steps
A asks without giving a score
If the steps are correct, give 1 point
If the steps are correct, give 1 point

11.a) right definition 1p
Right translation 2p
b) EI,UI 2p
modus ponens 2p
conjunction 2p
EG 1p
Wrong format -3p

12. supposition 1p
Common factor 3p
Contradiction 1p

Q13 Scoring Criteria (5 points)

- Partial Scores for Completing the Process:
  1. Formally state the conditions and conclusions of the problem (**1 point**)

     Let $\alpha = \frac{x}{y}, \beta = \frac{z}{w} (\alpha < \beta)$ where $y, w \in \mathbb{N}^*, x, z \in \mathbb{Z}$ (or equivalent expressions).
  2. Reduce the denominators of the two rational numbers to the same positive integer value (**2 points**)

     Let $l = \text{lcm}(y, w)$ (Least Common Multiple). Then $\alpha = \frac{x \cdot \frac{l}{y}}{l}, \beta = \frac{z \cdot \frac{l}{w}}{l}$.

     Note that $x, z, \frac{l}{y}, \frac{l}{w} \in \mathbb{N}^*$ and $x \cdot \frac{l}{y} < z \cdot \frac{l}{w}$ (As $\alpha < \beta$).

     Therefore, $x \cdot \frac{l}{y} + 1 \leq z \cdot \frac{l}{w}$(or equivalent expressions).
  3. Construct an irrational number γ in the interval (α, β):

     Construct $\gamma = (x \cdot \frac{l}{y} + \frac{\sqrt{2}}{2})/l$.
     - State that the constructed number is in (α, β) (**1 point**)

       Since $0 < \sqrt{2} < 2$, so $0 < \frac{\sqrt{2}}{2} < 1$,

       thus $\alpha = (x \cdot \frac{l}{y})/l < \gamma < (x \cdot \frac{l}{y} + 1)/l \leq (z \cdot \frac{l}{w})/l = \beta$, so $\gamma \in (\alpha, \beta)$.
     - State that the constructed number is irrational (**1 point**)

       If $\gamma = (x \cdot \frac{l}{y} + \frac{\sqrt{2}}{2})/l$ is rational, then $(x \cdot \frac{l}{y} + \frac{\sqrt{2}}{2})$ will be rational, which is incorrect ($x \cdot \frac{l}{y}$ is an integer, $\frac{\sqrt{2}}{2}$ is irrational, and adding a rational number to an irrational number cannot result in a rational number), so γ is irrational.
- General Scoring Criteria:
  - No answer or incorrect construction (and no **clearly noticed** partial scores), **directly 0 points**.
  - Correct construction but no explanation or proof (**even a little word**), **3 points**.
  - Correct construction with some (or **a little**) explanation but lacking a rigorous mathematical proof or with some missing parts in the proof, **4 points**.
  - Correct construction with a **clear explanation** that the constructed number is irrational and lies between two rational numbers, **5 points**.
- Points may be *deducted* in the following cases:
  - Difficult-to-understand proof or reasoning methods, all **0 points** (All of these proofs or explanations will be treated as non-existent).
  - Errors in the proof process, failure to consider signs, leading to incorrect conclusions, points deducted based on severity (**1 - 5 points**).
  - Serious omissions in the proof, such as an incomplete proof (possibly due to incomplete uploading), points deducted based on severity (**1 - 3 points**).
- Other proof methods are scored at the discretion of the evaluator.

Q14 Scoring Criteria (12 points)

- Partial Scores for Completing the Process:
    1. Verify the existence of solutions for all entries in the table (**3 points**, 1 point each case)
    2. Proof of no solutions other than those listed in the table when $m = 3$ (**2 points**).
    3. Proof of no solutions other than those listed in the table when $m = 4$ (**2 points**).
    4. Proof of no solutions other than those listed in the table when $m = 5$ (**2 points**).
    5. Proof of no solutions other than those listed in the table when $m \geq 6$ (**3 points**).
- General Scoring Criteria:
    - No answer, difficult-to-understand proof, all **0 points** (All of these proofs or explanations will be treated as non-existent).
    - Errors in the proof process leading to incorrect conclusions, points deducted based on severity (**1 - 6 points**).
    - Significant gaps in the proof, extensive use of unclear proof terminology such as "obvious" or "easy to see," points deducted based on severity (**1 - 8 points**).
    - Incomplete classification, fractionate the scoring according to the classification of the standard answers (as per the aforementioned **Partial Scores for Completing the Process** part) for the covered completed sections (**0 - 12 points**).
    - Complete classification and clear reasoning, **12 points**.
- Other proof methods are scored at the discretion of the evaluator.

Some Recommendations:

1. **Assignment Submission**: It is preferable to use a mobile **scanning app** (such as CamScanner) to scan your work before uploading it. Avoid completing assignments on draft paper and then directly converting photos to PDF for submission. Additionally, when uploading your assignment, ensure that it is in **portrait orientation (from top to bottom)** rather than landscape orientation (or other orientation like left to right, right to left, bottom to top etc).
2. **Proof-Based Questions**: Please provide **rigorous proofs and explanations**. Avoid presenting a seemingly valid conclusion without proper explanation, as such conclusions will be treated as **non-existent** during grading. Also, avoid skipping steps; allow the teaching assistants to follow your thought process, as **what may be obvious to you might not be as apparent to TAs!!!**.
3. **Neat Handwriting**: Make sure your work is legible and easily distinguishable. Unclear or illegible handwriting will be considered **non-existent** during grading.

Contact

If you have any questions, contact corresponding TA:

Q1-3: 12331240 潘凯歌

Q4-5: 12111842 张羽乐

Q6-8: 12110411 伍福临

Q9-10: 12110416 刘家宝

Q11-12: 12111046 张天舒

Q13-14: 12112910 罗嘉诚

Grade computation: 12332414 李昊洋