H2A

Student: Dong Liang

1.

Premises: Cube(a); SameCol(a,b); SameRow(a,b).

Conclusion: Cube(b)

Prove by informal proof:

SameCol(a,b) implies that a and b are in the same column and SameRow(a,b) implies that a and b are in the same row.

Thus, we have: 1.a is in the same row and column where b is. 2. b is in the same row and column where a is. And this means they are on the same position.

Since one object can only have one position which is represented as its column and row and a and b is on the same position, so they must be the same object.

Therefore, a=b.

Since we know Cube(a) is true, so Cube(b) is also true.

Q.E.D.

2.

1. Max and Claire are not related.
2. Nancy is Max's mother.
3. Nancy is not Claire's mother.

Does (3) follow from (1) and (2)?

Yes. Since if Max and Claire are not related (not sisters), so Nancy is not Claire’s mother.

Does (2) follow from (1) and (3)?

Max and Claire are not related.

Nancy is not Claire's mother.

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Nancy is Max's mother.

No.

Easy to give a counter example: Max and Claire are not related. Nancy is not Claire's mother. Nancy is not Max’s mother.

This example fit (1) and (3) statements but counters statement (2).

Does (1) follow from (2) and (3)?

Nancy is Max's mother.

Nancy is not Claire's mother.

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Max and Claire are not related.

No. A counterexample would be: Nancy is Max’s mother but not Claire’s. However, Nancy is Claire’s daughter, so Max’s is Claire’s granddaughter and they are related.