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PHILOS 12A / DIS 102

GSI: Mathias Boehm

Problem Set #9

Exercise 9.22

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Malcev’s | Bolzano’s | Boole’s | Wittgenstein’s |
| 1. | False | False | True | *False* |
| 2. | True | False | False | False |
| 3. | True | False | *False* | False |
| 4. | True | False | False | False |
| 5. | *True* | False | True | False |
| 6. | False | False | False | False |
| 7. | False | False | True | False |
| 8. | False | *True* | True | False |
| 9. | True | True | True | True |
| 10. | False | False | True | True |

Exercise 10.1

Diagram

Description automatically generated

Exercise 10.3 & Exercise 10.4

A picture containing text, whiteboard

Description automatically generated

Exercise 10.9

|  |  |  |  |
| --- | --- | --- | --- |
|  | Paraphrase | Logical Truth | FO Validities |
| 1. | If all the blocks are to the left of B, then B is to the right of the block | Yes | No |
| 2. | If all the blocks are small and the blocks are in the back of C, then the block is a dodecahedron | No | No |
| 3 | If all the blocks are cubes and not b, then the blocks are larger than B or the blocks are smaller than B | No | No |
| 4. | If D is a dodecahedron, then all the blocks’ named D is a dodecahedron | Yes | No |
| 5. | There are some blocks that if A is smaller than the block and the block is smaller than B, then A is smaller than B | Yes | No |
| 6. | If all the blocks are larger than C, then the block is not C | Yes | No |
| 7. | All the blocks are between A and D or the blocks are not between A and D | Yes | Yes |
| 8. | All the blocks are between A and D or the blocks are not between D and A | Yes | Yes |
| 9. | If all the blocks are dodecahedrons, then the block is D or the block is small | No | No |
| 10. | If all the blocks are to the left of E, then there does not exist a block that is a cube and the block is not to the left of E | Yes | Yes |

Part 4

1. ∀x (LeftOf(x, b) → RightOf(b, x))

Counterexample: Replace the red text with SameRow and the blue text with SameColumn

4. Dodec(d) → ∀x (x = d → Dodec(x))

Counterexample: Replace the red text with Dodec

5. ∃y (Smaller(a, y) ∧ Smaller(y, b)) → Smaller(a, b)

Counterexample: Replace the red text with DifferentShape

6. ∀x (Larger(x, c) → x ≠ c)

Counterexample: Replace the blue text with SameShape

Exercise 10.12

Text, letter

Description automatically generated

This is not tautologically valid. From the TFF, there cannot be a conclusion based on the given premises, so the conclusion is not always True with the premises in the TNF. The argument is logically valid since the conclusion can be proven based on the premises.

Exercise 10.13Diagram

Description automatically generated with low confidence

This is tautologically valid. From the TTF, the conclusion can be conned based on the premises. The conclusion is always True with the premises in the TNF. The argument is logically valid since we can prove the conclusion based on the premises.