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Problem Set #8

Exercise 9.11.2

Sentence 3: $\forall x\ (Tet(x) \wedge Small(x))$, Sentence 4: $\forall x\ (Tet(x) \rightarrow Small(x))$

There is no world that exists where Sentence 3 is True and Sentence 4 is False because they are both True.

Sentence 3 explains that X is a Small Tetrahedron in order for the conjunction to be satisfied. X is Small and a Tetrahedron. This returns True. Meanwhile, for Sentence 4, it can be said with the → that X is a Tetrahedron IF and ONLY IF X is Small. Because of this, X must be Small. This also means that X is a Tetrahedron. This would result with True.

Exercise 9.11.3

Sentence 1: $\exists x\ (Dodec(x) \wedge Large(x))$, Sentence 2: $\exists x\ (Dodec(x) \rightarrow Large(x))$

There is no world that exists where Sentence 1 is True and Sentence 2 is False because they are both True. This uses the same ideology as above except with the respective shapes and size.

Sentence 1 explains that X is a Large Dodecahedron in order for the conjunction to be satisfied. X is Large and a Dodecahedron. This returns True. Meanwhile, for Sentence 2, it can be said with the → that X is a Dodecahedron IF and ONLY IF X is Large. Because of this, X must be Large. This also means that X is a Dodecahedron. This would result with True.