

2.2 Zermelo Frankel Set Theory

Ernst Zermelo and Abraham Frankel came up with axiomatic approach to resolve Russell's Paradox.

Example:

1. If the train arrives late and there are no taxis at the station, then John is late for the meeting.
2. John is not late for the meeting.
3. The train did arrive late.

∴ There were taxis at the station.

Solution: p = Train arrives late. q = There are no taxis at the station. r = John is late for meeting.

1. $((p \wedge q) \rightarrow (r))$
2. $\neg r$
3. p
4. $\neg q$ (conclusion)

Statement 1 is true when proposition q is false. i.e. when conclusion is true. Hence the conclusion follows.

Example:

1. If it is raining and Jane does not have umbrella then she will get wet.
2. Jane is not wet.
3. It is raining.

→ Therefore, Jane has her umbrella with her.

Argument 1	Corresponding argument 2
Train is late (p)	It is raining
There are taxis at the station(q)	Jane has an umbrella
John is late (r)	Jane is wet