

	<i>Commonsense Notion</i>	<i>Counter-Intuitive Notion</i>
Cantor S₁	1-to-1 correspondance	Hierarchy of Transfinites
Cantor R₁	A single "infinity"	<p>(i) 1-1 correspondance is not a valid procedure for establishing numerical equality for infinite sets. Two alternatives:</p> <p style="padding-left: 40px;">(a) An infinite number of steps is prohibited.</p> <p style="padding-left: 40px;">(b) Ordered sets must be 'presented', that is to say, pre-counted. This requires a new axiom.</p> <p>(ii) There is a way of putting the power set of a countably infinite set S into 1-1 correspondance with S itself. One postulates that non-computable 'numbers' aren't real numbers, their binary representation a meaningless string of digits.</p>

Russell S₂	All sets are well-defined	Unextendable Propositions
Russell R₂	All propositions define sets	"The sets of all sets not containing themselves" is a set, but not well-defined; "The set of all well-defined sets not containing themselves" is not a paradox . 'Formal sets' have their own objective existence , without being well-defined as sets
Minkowski S₃	Velocity is measured by clocks and rulers	Upper limit to velocity given by speed of light
Minkowski R₃	Linear addition law for velocity	"velocity" and "time" become pseudo-magnitudes under a change of reference frame. The correct magnitudes are proper time and relativistic angle. These are uncoupled, and an autonomous time-like direction for 'free action' is recovered

Equivalence S4	Equivalence of Inertial and Gravitational Mass	Matter warps space-time
Equivalence R4	Matter doesn't warp space-time	Gravitational Mass is not inherent in material bodies but in their interaction. The "multiplication" of masses in Newton's equation is replaced by a function Ω , of two inertial masses.
Postulate of Relativity S5	All clocks "at rest" are equivalent	No simultaneity
Postulate of Relativity R5	Simultaneity	(1) Universal time measured from Big Bang (General Relativity) (2) Only one reference frame is correct (Special Relativity)
Heisenberg S6	1- and 2-slit experiments give conflicting pictures	Electron and Photon are wave/ particles

Heisenberg R₆	No contradiction in evidence, only in interpretation	(1) The sense organ for "seeing" the quantity measured by the Schrödinger wave function is missing. (2) Electrons follow QED Photons follow DeBroglie Wave Mechanics.
Boltzmann S₇	Molecules collide by the laws of Galilean mechanics	2nd Law of Thermodynamics is statistical
Boltzmann R₇	2nd Law of Thermodynamics is exact	Mass and velocity fluctuate. Momentum conserved; Energy conservation modified.