



Math for the people, by the people.

law of trichotomy

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The *law of trichotomy* for a binary relation R on a set S is the property that

- for all $x, y \in S$, exactly one of the following holds: xRy or yRx or $x = y$.

A binary relation satisfying the law of trichotomy is sometimes said to be *trichotomous*. Trichotomous binary relations are equivalent to tournaments, although the study of tournaments is usually restricted to the finite case.

A transitive trichotomous binary relation is called a total order, and is typically written $<$.

The law of trichotomy for cardinal numbers is equivalent (in ZF) to the <http://planetmath.org/AxiomOfChoice> axiom of choice.