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σ -algebra

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Let X be a set. A σ -algebra is a collection M of subsets of X such that

- $X \in M$
- If $A \in M$ then $X - A \in M$.
- If A_1, A_2, A_3, \dots is a countable subcollection of M , that is, $A_j \in M$ for $j = 1, 2, 3, \dots$ (the subcollection can be finite) then the union of all of them is also in M :

$$\bigcup_{j=1}^{\infty} A_j \in M.$$