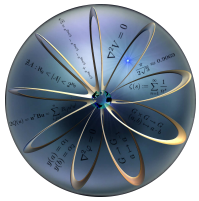

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equivalence class

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Let S be a set with an equivalence relation $\sim$. An *equivalence class* of S under $\sim$ is a subset $T \subset S$ such that

- If $x \in T$ and $y \in S$, then $x \sim y$ if and only if $y \in T$
- If S is nonempty, then T is nonempty

For $x \in S$, the equivalence class containing x is often denoted by $[x]$, so that

$$[x] := \{y \in S \mid x \sim y\}.$$

The *set of all equivalence classes* of S under $\sim$ is defined to be the set of all subsets of S which are equivalence classes of S under $\sim$, and is denoted by $S/\sim$. The map $x \mapsto [x]$ is sometimes referred to as the .

For any equivalence relation $\sim$, the set of all equivalence classes of S under $\sim$ is a partition of S, and this correspondence is a bijection between the set of equivalence relations on S and the set of partitions of S (consisting of nonempty sets).