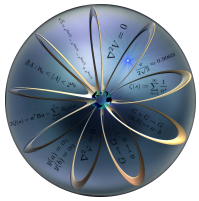

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coalgebra homomorphism

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Let (C, Δ, ε) and $(D, \Delta', \varepsilon')$ be coalgebras.

Definition. Linear map $f : C \to D$ is called *coalgebra homomorphism* if $\Delta' \circ f = (f \otimes f) \circ \Delta$ and $\varepsilon' \circ f = \varepsilon$.

Examples. 1) Of course, if D is a subcoalgebra of C, then the inclusion $i : D \to C$ is a coalgebra homomorphism. In particular, the identity is a coalgebra homomorphism.

2) If (C, Δ, ε) is a coalgebra and $I \subseteq C$ is a coideal, then we have canonical coalgebra structur on C/I (please, see `http://planetmath.org/SubcoalgebrasAndCoidealsthis` entry for more details). Then the projection $\pi : C \to C/I$ is a coalgebra homomorphism. Furthermore, one can show that the canonical coalgebra structure on C/I is a unique coalgebra structure such that π is a coalgebra homomorphism.