Source:

1 | In the context of Linear Algebra (Axler 3.15)

1.1 | #definition injective def

A function $T : V \to W$ is called *injective* if $Tu = Tv$ implies $u = v$

1.2 | #aka one-to-one aka

1.3 | Properties

1.3.1 | A map is injective iff it's null space equals $\{0\}$

1.3.2 | A map to a smaller dimensional space is not injective (Axler3.23)

1.4 | Intuition

$Tu = Tv \implies u = v$ means that if the outputs are the same, then the inputs are the same, aka only one input goes to that one output. That's why it's called "one-to-one": only one input goes to that one output