Source:

1 | **well defined def**

A function is well defined if each element of the domain has exactly one image. Formally,

A function $f : X \to Y$ is a relation f from X to Y satisfying:

1. $\forall x \in X, \exists y \in Y$ s.t. $(x, y) \in f$ (every element of the domain has an image)
2. $\forall x \in X, \forall y_1, y_2 \in Y, (x, y_1), (x, y_2) \in f$ implies $y_1 = y_2$ (each element of the domain has at most one image)

2 | **counterexample**