Last name _____

First name _____

LARSON—MATH 401—CLASSROOM WORKSHEET 08
Functions.

A function $f : A \to B$ is *one-to-one* if different elements of A map to different elements of B. That is, formally, if $a, b \in A$ and $a \neq b$ then $f(a) \neq f(b)$ (or, equivalently, if $f(a) = f(b)$ then $a = b$).

A function $f : A \to B$ is *onto* if every element of B has an element of B that maps to it. That is, formally, for ever $b \in B$ there is an $a \in A$ with $f(a) = b$.

A function $f : A \to B$ is a *bijection* if it is one-to-one and onto.

For functions $f : A \to B$ and $g : B \to C$, define their *composition* $g \circ f : A \to C$ as $g(f(x))$.

1. For functions $f : A \to B$ and $g : B \to C$, if $g \circ f$ is onto, show g is onto.