The following problems from Chartrand, et. al:

Chapter 8: 6, 10, 11, 14, 25, 28 (Hint for 28: it suffices to find an inverse function).

Also, prove the following:

Problem 1. *Let $f : X \to Y$ and $g : Y \to Z$ be functions. If $g \circ f$ is injective, then f is injective. If $g \circ f$ is surjective, then g is surjective.*

Problem 2. *Let $f : X \to Y$ be a surjective function. For any set $U \subset Y$, $f(f^{-1}(U)) = U$.*

Problem 3. *Let $f : X \to Y$ be an injective function. For any set $V \subset X$, $f^{-1}(f(V)) = V$.*

Problem 4. For the last two problems, show that the adjectives surjective and injective are necessary.