

## MATH 220 HANDOUT 13 - INVERSES

Let  $f: A \rightarrow B$  and  $g: B \rightarrow C$  be functions. Prove or disprove each of the following:

- (1) If  $f$  and  $g$  are invertible, then  $g \circ f$  is invertible..
- (2) If  $g \circ f$  is invertible, then  $f$  and  $g$  are invertible.
- (3) If  $g \circ f$  is invertible, then  $f$  is invertible.
- (4) If  $g \circ f$  is invertible, then  $g$  is invertible.
- (5) If  $g \circ f$  is an injection and  $g$  is invertible, then  $f$  is an injection.