Suppose: $h(a) = h(b)$; $a, b \in h$

so $g \circ f(a) = g \circ f(b)$

and $g\left(f(a)\right) = g\left(f(b)\right)$

$f(a) = f(b)$ because g is 1-to-1

$a = b$ because f is 1-to-1

so h is 1-to 1

Let: $a \in T$

then $x \in S$ and $g(x) = a$

x exists because g is onto

so $y \in R$ and $f(y) = x$ exists because f is onto

and $h(y) = g(f(y)) = g(x) = a$

so h is onto.

Let $f: R \to S$ and $g: S \to T$

and $h = g \circ f : R \to T$

If f and g are homomorphisms

prove h is a homomorphism.

Study for quiz/test March 30

- Prove a set is (or is not) a sub-ring by checking 4 ring properties (see thm 3.2)

Examples: 3.1 Exercises 1, 5, 6, 8, 11a, 12, 13

3.2 exercises 7, 8, 10

- Prove a ring property

Examples: 3.1 Exercises #22, 23, 24, 25.

~~Exa~~ Sample problem: for the set with addition & multiplication in #24, prove that the distributive law is satisfied (Ring axiom 8).

- Prove a solution exists and is unique

Examples: 3.2 Exercises 5, 12

- Prove a sub-part of theorem 3.5